

Performance Audit Report

Management of Research

**NSW Health:
Infrastructure Grants Program
A Case Study**

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Executive Summary

Executive Summary

The Audit

The Audit Office reviewed the Infrastructure Grants Program (IGP), a scheme announced in April 1996 and administered by New South Wales Health (NSW Health).

The objective of the audit was to examine whether funds for health and medical research and development (R&D), provided by the IGP, are relevant to health needs and priorities and had impact.

Funds allocated from the program in 1997-98 were approximately \$11m. This forms part of a larger \$300m Commonwealth and State commitment in 1997-98 Australia wide to health and medical research.

Infrastructure Grants Program

The IGP provides funding to successful applicants for infrastructure in support of health R&D and was introduced by NSW Health in 1996-97 as a key element of a broader R&D strategy.

The IGP was developed in response to criticism that much R&D supported by the public sector is funded on an ad hoc basis and does not meet accountability standards.

The IGP seeks to ensure that the allocation of public funds through the program is achieved in a fair and equitable manner and is directed to high quality R&D which is relevant to health and medical goals and priorities.

The IGP introduces eligibility and selection criteria in the allocation of funds and improves accountability requirements by the introduction of Service Agreements with recipients of grants who are accountable for the funds they receive.

The IGP seeks to enhance the capacity of health and medical research organisations by providing infrastructure funding which acts as leverage for attracting other funds particularly from the private sector. It was introduced to overcome inadequacies in other funding programs (where no assistance is provided for infrastructure).

Audit Findings

NSW Health has progressed in identifying and addressing key R&D issues in a complex and difficult environment.

The IGP is an innovative program and reflects a commitment by Government to support research infrastructure. The IGP has as its aims the provision of significant funding accompanied by clear research objectives and criteria for accountability and introduces a rational basis for the allocation of infrastructure grants.

The IGP is generally well received by the research community including those applicants who were not successful in obtaining a grant.

As with any new program, its execution is a learning process. NSW Health has advised that future funding cycles would build on the experience gained in the first cycle and introduce progressive improvements. As part of a continuing commitment to on-going strategic planning for R&D, NSW Health and the Research and Development Advisory Committee (known as the R&D Advisory Committee) have advised that a workshop later this year will address many of the issues raised in this report.

Other public sector agencies may benefit from examining NSW Health's approach to developing an effective and accountable research funding model. That model addresses complex research issues and was developed after extensive consultation with, and involvement of, the health and medical research community.

While NSW Health has progressed, there is an opportunity to make the IGP more efficient and effective. These opportunities are in the areas of:

- addressing longer term planning issues in health
- streamlining and clarifying eligibility and selection criteria
- improving decision-making structures and processes
- improving accountability.

Health Priorities

The IGP does not balance funding between areas of R&D deemed to be priority.

A reason for this is that the IGP targets independent organisations which have been established by legislation or are incorporated as companies or associations. Many of these organisations undertake high profile R&D such as cancer and cardiovascular disease. Fewer of them undertake research into other areas rated as high priority. Thus, in the first funding cycle, 16 of the 31 successful applicants for infrastructure funding undertook research into cancer.¹

Investigator-driven research is important because it encourages creative solutions to important problems. However, there is a need to balance investigator-driven research with directed research. NSW Health has begun to address this issue and should consider how directed research should address identified health problems.

Criteria

The R&D Committee advises NSW Health on, among other things, R&D policy and funding principles and on ways to determine R&D priorities.

The IGP criteria, drafted by some members of the R&D Committee following a consultative process involving the research community, were endorsed subsequently by the Committee. The criteria were modelled on National Health and Medical Research Council (NH&MRC) Guidelines.

While members of the R&D Committee were not involved in the selection of successful applicants, a number of R&D Committee members were applicants for grants and received a grant from the IGP. This situation gives rise to a potential or apparent conflict of interest. It is important that the process of developing and finalising the criteria be, and be seen to be, free of those potential conflicts.

¹ Some applicants were funded in 1996-97 and others in 1997-98. The Minister for Health launched the IGP in April 1996.

A criterion used to determine the level of funding to certain successful applicants is the level of peer-reviewed grants previously received. There is a tension between using peer-reviewed funding obtained to determine the basis for allocating funds under the IGP and achieving equity and fairness (an objective of the IGP). Problems with relying on peer review to determine merit have been well documented by the Australian Research Council (ARC) and in the international literature.

In addition there is a tension between using this criterion and satisfying the intention of the scheme to provide infrastructure funding which researchers could not obtain from other sources.

A third of successful IGP applicants did not demonstrate compliance with all eligibility criteria.

While the use of eligibility and selection criteria is well founded, the criteria are too many in number to use easily. They are overly complex, not defined clearly and at times are duplicated.

Applicants will be better able to meet the required criteria if the criteria are more precisely defined. Examples include: independence of organisations; collaboration between researchers and industry; and measuring performance. These are discussed below.

Eligibility criteria are usually applied to grant applications before selecting on merit. This procedure was not always followed for IGP applications.

Independence

Another criterion of the IGP is that a research organisation should have 'sufficient independence' to determine its own R&D directions, exercise control over its R&D infrastructure budget and account for the grants it receives.

In practice 'sufficient' independence was often interpreted in terms of governance arrangements and management structure.

Organisations whose existence and authority are established by legislation or are incorporated entities are possibly the only groups which conform with these governance and structural characteristics.

Most research outside incorporated entities is undertaken in universities or hospitals with researchers having links to both. These researchers, while able to determine policy direction, would not necessarily comply with the narrower interpretation of independence. Clarification of the term independence is suggested.

Consistent Aims

The IGP has in this matter apparently conflicting aims in that it seeks to promote simultaneously competition and collaboration between researchers.

While for example, R&D organisations compete for funding from the IGP, collaboration and other forms of interaction with universities is nonetheless encouraged.

The Department needs to resolve the tension between these two aims.

Industry Impact

The IGP seeks to fund those organisations whose R&D has impact, evidenced by the organisation attracting private sector funding and producing commercial outcomes. Of successful applicants just over a third receive funds from industry and commerce.

NSW Health encourages organisations to work in collaboration with industry. NSW Health is acting as a catalyst by working with the Department of State and Regional Development (SRD) to address issues in planning for the transfer of research to commercial outcomes.

Issues surrounding how best to foster industry support of R&D are complex and include:

- whether and to what extent public funds should support those organisations which also receive private sector funding
- public funding of private sector research may be supporting commercial outcomes and not health and medical priorities as determined by NSW Health
- the risk of losing control of the research agenda
- the question of ownership of intellectual property generated by publicly funded R&D activity
- an appropriate level of accountability for public monies granted to organisations which are incorporated under company or other legislation or which receive substantial funds from the private sector.

NSW Health has commissioned a paper on intellectual property to provide a basis for the development of its policy on this matter.² Clarification of policies in the other areas identified above would assist potential IGP applicants understand how they would or would not comply with the criterion of collaboration with industry.

*Academic
Performance*

Part of the IGP concept of merit relies on a definition of academic performance which requires the applicant to have published research papers, articles etc. and to have attracted peer-reviewed grants.

The concerns in regard to peer-reviewed grant programs needs further attention.

Assessment

The assessment of applications for infrastructure funding is undertaken by one or a very limited number of personnel within NSW Health who are able to consult with others about applications, where that is necessary.

The use of assessment panels as originally proposed by NSW Health in 1996 has not eventuated. A reason given was the difficulty in selecting a panel of independent experts from a small population of researchers and at the same time avoiding a potential for conflict of interest.

It is considered that:

- to determine compliance with criteria the use of researchers or persons with medical qualifications may not be essential in all cases
- procedures can be established for the management of potential conflicts of interest
- the use of persons from interstate may be appropriate.

These arrangements would allow for a more open, balanced and transparent process.

Decision Making

The decision-making process and its transparency, would be enhanced by the ranking of applications in order of compliance with criteria which are also merit weighted.

Communication

There is no formal system in place for applicants wishing to seek an explanation of aspects of the program or for clarifying their application. Those wishing to do so were accommodated.

² NSW Health has recently commissioned a paper on the Management of Intellectual Property by Professor Hunyor.

Applicants are not automatically advised of reasons for failing to receive a grant, although where applicants sought an explanation for failure to receive a grant, they were accommodated. Provision of reasons for failure to obtain a grant as an automatic and standard procedure would assist applicants' understanding of the decision and help them to develop subsequent applications. The IGP would benefit from the introduction of an appeals mechanism.

Developing procedures to address these two issues, and advising applicants of these procedures, in both these areas would assist applicants and would help to improve the quality and transparency of decision-making.

Service Agreements NSW Health has a Service Agreement with successful applicants which covers responsibilities and obligations of both parties.

The Service Agreement, including the form of reporting, was arrived at after consultation with the research community. Individual grant recipients were able to, and some did, negotiate changes to the Service Agreement.

The Service Agreement, in its standard form, is quite extensive and could benefit from focusing on essential requirements such as determining conditions as to how IGP funds are to be spent.

Continuous Improvement NSW Health can now use the experience gained from the first IGP round to document specific policies and protocols which are needed. NSW Health believes that such documentation would increase the efficiency, consistency and transparency of the IGP process aiding both applicants and NSW Health staff.

The lessons learned would also assist other agencies in their management of research programs.

Evaluation NSW Health has undertaken limited evaluation of some IGP recipients.

As the IGP is a new program a formal evaluation at the end of the its first cycle of funding (1998-99) would assist its future development.³

³ It is acknowledged that some recipients received funding in 1996-97 and others in 1997-98.

Recommendations

The main recommendations arising out of the audit are set out below. Detailed recommendations are included at the end of each chapter and aggregated within Appendix 2 at the end of the report.

It is recommended that NSW Health enhance the IGP by:

- | | |
|-----------------------------|--|
| Planning | <ul style="list-style-type: none">• pursuing its strategic planning process to identify longer term R&D priorities, taking into account the need to balance investigator-driven research with directed research. NSW Health should request the assistance of the R&D Committee with this process |
| Decision-making | <ul style="list-style-type: none">• refining decision-making processes and mechanisms through:<ul style="list-style-type: none">◇ weighting priority areas as identified by the planning process◇ reviewing the appropriateness and definitions of eligibility and selection criteria◇ ensuring the concept of merit or performance is appropriate and reflects equity and fairness (among the objectives of the IGP)◇ having a clearer policy statement and rationale for the kinds of collaborative links, including industry links, to be encouraged◇ weighting criteria◇ ranking applications◇ using assessment/review panels to determine eligibility for the IGP before selection on merit is considered◇ supplying reasons for adverse decisions◇ introducing an appeals panel. |
| Policy and Protocols | <ul style="list-style-type: none">• developing a communications policy and protocols. |
| Accountability | <ul style="list-style-type: none">• improving accountability through reviewing the content and implementation of the Service Agreement. |
| Evaluation | <ul style="list-style-type: none">• evaluating the IGP by a formal evaluation process at the end of its first cycle of funding. |

Response from NSW Health

*The Performance Audit Report **Management of Research** has been reviewed by officers within this Department. I am pleased that the report recognises the innovative nature of the Infrastructure Grants Program (IGP) and some of its achievements. NSW Health is strongly committed to supporting medical research in NSW.*

The report highlights some of the complex issues which surround the funding of medical research: aligning research to health priorities, establishing robust and independent mechanisms for evaluating research proposals and balancing the proven record of investigator driven research with the need for directed health services and public health research.

The Report perhaps does under-emphasise some of the achievements of the IGP. The funds made available under this program represent a significant contribution to medical research infrastructure in NSW. These funds have provided things like computers, photocopiers, administrative assistance and animal house attendants for example to researchers who had, in many cases, no prior access to these basic services.

The IGP has been running now for two years. From the outset it was envisaged that the evaluation of research performance and the criteria for selection of successful applicants would be the subject of constant review. The research Development Advisory Committee, chaired by Professor Stephen Leeder oversees the development of research policy and IGP implementation.

There is one issue in the report which needs clarification. On page 44 the Report states that:

There is a need to have a more rigorous, independent and transparent decision making process, especially in terms of compliance with eligibility criteria. One way this could be achieved is by the use of assessment/review panels.

The RDAC gave careful consideration to the development of eligibility and selection criteria and they were then applied in a rigorous manner. The option of having an independent assessment and review panel was considered but rejected because of costs and because of the perceived difficulty in obtaining independent members from NSW to sit on such a panel. RDAC intends to convene a forum in late 1998 for all potential grant recipients to come to some agreement about selection criteria and methods of evaluation.

*(signed)
Michael Reid
Director General
Date: 12 November 1998*

1. Introduction

1. Introduction

This chapter outlines the rationale for and the features of, the Infrastructure Grants Program (IGP) introduced by NSW Health.

The IGP is a research and development (R&D) program designed to value add to the research it funds and the accountability thereof.

The IGP was reviewed by The Audit Office as a case study as to how a public sector agency might develop its approach to and manage its R&D.

1.1 What is R&D?

Research (often referred to as R&D because of its applied as well as basic nature) is:

*... creative work undertaken on a systematic basis in order to increase the stock of knowledge-including knowledge of man, culture and society-and the use of this knowledge to devise new applications.*⁴

Health and medical R&D is carried out in a number of environments:

- universities, where researchers also teach
- teaching hospitals and other health care facilities, where researchers are likely to be involved in patient care and teaching
- dedicated research units, some of which have links with or are located in universities, hospitals and other health care centres
- Commonwealth and State Government departments and agencies
- commercial environments.

⁴ Organisation for Economic Cooperation and Development (OECD), *The Measurement of Scientific and Technical Activities Frascati Manual*, OECD, Paris, 1980.

1.2 R&D Policy and Funding

Health and Medical Research

Governments support health and medical research because of the social and economic benefits it provides the community such as:

- less disease
- a longer human life span
- better quality of life
- increased productivity.

It has been argued elsewhere, for example by the Productivity Commission that R&D would be below optimum levels without Government support.

Responsibility for, and contribution to, health and medical research policy and funding in Australia is diverse and fragmented.

Numerous reviews at the Commonwealth and State level have criticised the Commonwealth Government for not having a strategy and implementation plan to provide leadership and co-ordination in R&D policy and funding.⁵

Currently the Wills review at the Commonwealth level is examining the future role of health and medical research up to the Year 2010. In particular the review is seeking to identify likely future developments in health and medical research with a view to developing an economic framework to support a recommended strategic plan:⁶

One of the big questions for the Wills review will be how to strike the right split between this undirected, so-called investigator-driven research, and research that is run more according to the agenda of government or industry.⁷

⁵ The Commonwealth sets direction through the NH&MRC. Health funding in NSW is administered separately and is not the subject of a Commonwealth/ State agreement.

⁶ Commonwealth of Australia Health and Medical Research Strategic Review (known as the Wills Inquiry).

⁷ R. Moynihan, 'Medical Research in Australia', Radio Australia, 25 April 1998.

The NH&MRC is concurrently examining its priorities to ensure R&D is more relevant to the health of the Australian population:

*... we're not there just to give out grants to best research, we are there for that but we're also there to make sure that the issues we're tackling are the big health problems of the nation.*⁸

Funding for Research

The Commonwealth and State Governments directly and indirectly fund R&D.

When Commonwealth and State commitments to health and medical research are taken into account, expenditure for health and medical R&D is at least \$300m per annum.⁹ The Commonwealth Government will distribute \$170m through the NH&MRC in 1997-98.

Significant funding contributions are also made by foundations, community organisations and industry.

The most significant Commonwealth contributors are:

- the NH&MRC
- the ARC
- the Department of Human Services and Health.¹⁰

At the State level, NSW Health plays a major role in policy setting and funding through:¹¹

- centrally based initiatives such as the IGP
- Area Health Services (AHS)
- hospital R&D grants.

States' Initiatives

In a perceived absence of Commonwealth policy leadership and adequate funding, the States have been left to determine policy and funding directions to suit local conditions.

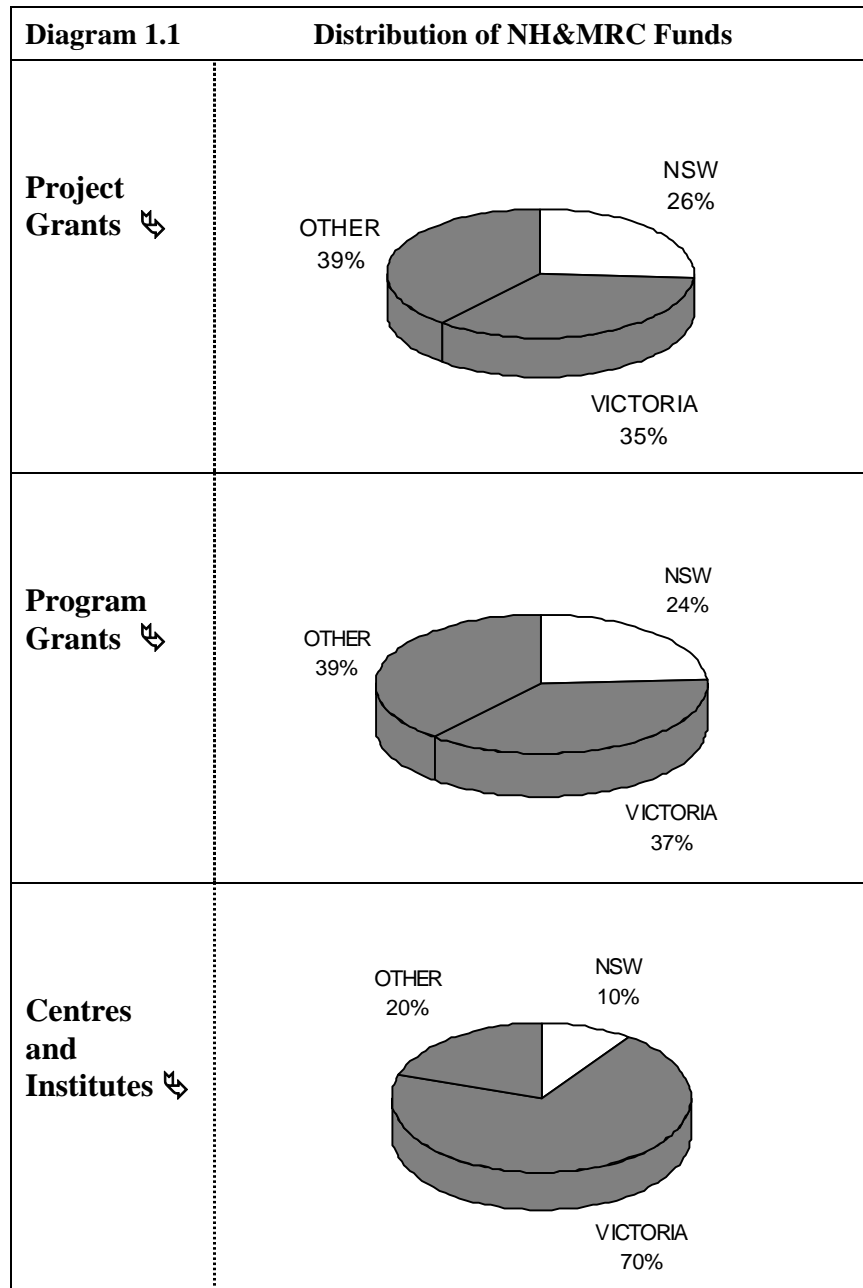
⁸ Professor W. Anderson, 'Medical Research in Australia' Radio Australia, interview with R. Moynihan, 25 April 1998.

⁹ R. Moynihan, 'Medical Research in Australia', Radio Australia, 25 April 1998.

¹⁰ Other key policy bodies include Australian Health Ministers Advisory Council (AHMAC) and Australian Health Ministers Conference (AHMC). National, non-profit funding organisations which provide funds for health and medical research include CSIRO and the Australian Cancer Councils.

¹¹ In this audit, NSW Health is regarded as comprising Central Office, Area Health Services and hospitals.

Some States have responded by providing infrastructure grants for health and medical research. Victoria has provided grants for several decades to its large health research institutes. As a consequence Victoria has attracted a greater level of operational funds from the NH&MRC (Diagram 1.1).



Source: NH&MRC website

Note: (1) Total funds include other programs not specified here.
 (2) Total funds of \$55,358,267 for all states include continuing and new grants including Project Grants for HIV/AIDS.

1.3 R&D as Value for Money

Improving the outcomes from public expenditure on R&D requires consideration of:

- what are the priority areas for R&D
- how to obtain best value for the research dollar¹²
- a greater balance between current and future health priorities¹³
- how to define priority areas so as to provide a useful mechanism for determining research priorities and for ensuring value for money¹⁴
- the weighting to be given to different types of research (basic, applied etc.) to reflect more closely the research questions which need to be addressed¹⁵
- a responsive approach to R&D so that it is possible to ‘*move very quickly from fundamental discoveries to applications*’¹⁶
- how to determine whether research is of a high enough standard to warrant public support
- what weighting to give to:
 - ◇ issues principally relevant to NSW
 - ◇ leading edge R&D because it offers economic benefits
 - ◇ R&D organisations located in NSW but of international significance.

¹² J. Hall Submission to NSW Health 2 November 1995.

¹³ Hall op. cit.

¹⁴ Submissions to NSW Health in the development of the Infrastructure Grants Program pointed out that the existing priority areas cover such a broad spectrum of morbidity and mortality, that it would be difficult to determine automatically research investment in these broad areas represented value for money.

¹⁵ This may include issues such as the dissemination of evidence to influence practice, the development of managed care models of service delivery, the effects of incentives in practice, the study of area variations in treatment patterns, the measurement and improvement of customer satisfaction.

¹⁶ B. Olgilvie, Outgoing Director, Wellcome Trust, interview with R. Moynihan, ‘Medical Research in Australia’, Radio Australia, 25 April 1998.

1.4 NSW Health's New R&D Strategy

Until 1996 NSW Health provided general financial support to medical and health researchers via a funding program (External Grants Program) with little relationship between funded projects and health targets. There was limited accountability for the expenditure of funds.¹⁷

In response to continuing concerns about lack of strategic direction and fragmentation in policy and funding NSW Health decided to develop its own R&D strategy.¹⁸

In 1990 the NSW Health Department and the NSW Science and Technology Council commissioned a consultant *'to investigate the issues and develop proposals to increase the levels and sources of funding to medical research in New South Wales.'*¹⁹

The consultant recommended improving support for quality research in higher education institutions (universities) and independent institutes (established under their own legislation or incorporated under legislation for companies or incorporated associations) by providing seeding funds in areas of need and infrastructure funds.

Encouragement of industry support for R&D was also recommended. The detailed recommendations are included within Appendix 3.

As a consequence of the consultant's work a new R&D strategy, IGP framework and principles for funding, were promulgated in 1994 with extensive discussion taking place with the research community during 1995.

The final version of the strategy was announced in 1996 after extensive consultation with the research community and with a newly formed R&D Committee, representing a wide range of expertise and interests.

¹⁷ NSW Health *Research and Development in the New South Wales Health System Discussion Paper* 1996 (hereafter referred to as the *Discussion Paper*). Note that other NSW Health funds are directed to research through Area Health Services, hospital grant programs and program areas which are centrally administered.

¹⁸ see J. Llewellyn-Smith 'Health and Medical Research Funding', Draft Discussion Paper, Consultant's Report to NSW Science and Technology Council, NSW Department of Health, June 1990.

¹⁹ Llewellyn-Smith, *op. cit.*, p.7.

The strategy included an infrastructure funding component designed to act as leverage for attracting other funds particularly from the private sector. The strategy addressed several key issues which governments in other States and overseas had not yet resolved.

NSW Health's new approach to health and medical R&D aimed to:

- promote recognition of the contribution of research to the health of individuals and the community
- ensure research-based knowledge relates to health policy development and practice
- align R&D investment with health priorities
- introduce accountability mechanisms that link R&D investment with outputs and outcomes
- set a course for R&D in NSW that enhances existing research strengths
- develop initiatives that capitalise on the research base for economic gain
- complement and enhance national strategic directions in health research, science and technology.

NSW Health has progressed in identifying and addressing key R&D issues in a complex and difficult environment. The IGP is an innovative program and reflects a commitment by the Government to support research infrastructure. The IGP has as its aims the provision of significant funding accompanied by clear research objectives and criteria for accountability and introduces a rational basis for the allocation of infrastructure grants.

As in any new Program, the execution is a learning process. NSW Health always anticipated that future funding cycles would build on the experience gained in the first cycle and introduce progressive improvements. As part of a continuing commitment to on-going strategic planning for R&D, NSW Health and the R&D Committee have advised of the holding of a workshop later this year to address a range of issues, many of which are raised in this report.

Other public sector agencies may benefit from examining NSW Health's approach to developing an effective and accountable research funding model. The model addresses complex research issues and was developed after extensive consultation with and involvement of the research community.

In summary the NSW Health R&D strategy has two components:

- a short-term strategy, which depends on the immediate policy and funding commitments and which sought to maximise use of existing R&D resources
- a longer term component involving

*... a detailed assessment of R&D priorities in relation to the needs of the health system up to the year 2010, aiming to focus R&D investment on meeting these needs.*²⁰

A workshop later in 1998 will address a range of these longer term issues.

The IGP

The IGP is a key but not the only element of the new strategy. It sought to:

- remedy the deficiency in infrastructure funding to independent research institutes
- ensure funded research would reflect NSW Health's broader R&D strategy designed to foster quality, relevant research.

The IGP is discussed in more detail in Chapter 2 *The Infrastructure Grants Program*.

1.5 Cost of the Audit

	\$
Direct Salary Costs	76,760
Value of Unpaid Overtime	1,000
Printing (estimate)	4,000
Consultants	2,700
Total	\$84,460

Acknowledgments

The Audit Office wishes to acknowledge the cooperation and assistance extended throughout the audit by representatives of NSW Health, Chief Executive Officers of Area Health Services, the Research and Development Advisory Committee and Infrastructure Grants Program applicants.

²⁰ *Discussion Paper*, op.cit, p.3.

2. The Infrastructure Grants Program

2.1 Introduction

This chapter outlines the objectives, evolution and features of the IGP. It then explains how deficiencies in other funding programs led to the creation of the IGP.

2.2 The IGP

The IGP demonstrates the Government's recognition of the value in investing in R&D by increasing its contribution to the support of R&D in NSW. Commencing in 1996-97 NSW Health allocated \$11m to the IGP, replacing an existing program which provided approximately \$5m. In addition, for the first time, an allocation was made to public health R&D. The program demands increased accountability from recipients through written agreements.

The IGP directed funds specifically towards the provision of R&D infrastructure rather than project funding. This posed specific challenges with regard to the development of application and selection processes. The IGP sought not only to fund biomedical and clinical research organisations but to encourage public health and health services research by setting aside funds specifically for this purpose.

Approximately 90 per cent of IGP funds in the first round were allocated to institutes which carried out biomedical research and/ or clinical research. Around 10 per cent of funds were distributed to organisations researching population health, health services and health economics.²¹

Grants were to be awarded on a competitive basis rather than on an historical basis. Rather than provide project grants, funds were made available to support:

*... the facilities and functions of a research organisation which cannot be funded from project grants. Infrastructure thus includes physical facilities (ranging from buildings through some types of scientific equipment to telephones and fax machines) and the salaries of administrative and some senior scientific staff. It excludes funds, staff and materials deployed on specific projects.*²²

²¹ This allocation was judged by the R&D Committee to be appropriate at this stage of the evolution of the R&D strategy. R&D Committee Minutes Meeting No. 3, p.4.

²² *Application Kit.*

Rationale

There is a strongly held view in the research community and echoed in most R&D policy and program reviews that infrastructure assists high quality and relevant research because it:

- acts as a lever to attract operating grants
- attracts a stable and flourishing research environment and skilled workforce.

2.3 The IGP and the R&D Strategy

As a reflection of the new R&D strategy, the IGP aims to:

- generate innovation
- support excellence in research which addresses present and foreseeable problems in health and health services
- ensure research-based knowledge is applied in health practice and the development of health policy
- build a strong relationship between R&D and industry.²³

Objectives

The specific objectives of the IGP are to:

- provide infrastructure funding on a fair and equitable basis for outstanding statewide research organisations
- align this funding with the NSW health system priorities
- ensure that research organisations which receive funds comply with accountability requirements
- promote the dissemination and application of research results.

²³ *Application Kit*, op.cit., Summary.

2.4 Infrastructure Funding

Both the Commonwealth and State Governments fund health and medical R&D infrastructure.

Universities

University R&D infrastructure is funded from:

- ARC Research Infrastructure Block Grants to higher education institutions administered by the Department of Employment, Education, Training and Youth Affairs (DEETYA) on the advice of the ARC
- indirect operational support through the Research Quantum²⁴
- ARC Research Infrastructure (Equipment and Facilities) Grants
- grants won from the NH&MRC:²⁵
 - ◇ project funds which provide for equipment, maintenance, supplies and experimental animals but may not meet all infrastructure needs
 - ◇ equipment grants, while providing for infrastructure, have not been made recently because of cost pressures on the program.

Hospitals and Independent Institutes

Hospital based research institutes and independent institutes (defined by NH&MRC as having their own legislation or as a company or incorporated under legislation) rely on:

- State Government health funding
- fund raising
- industry funds
- other grants including the ARC (where appropriate), bodies such as the Cancer Council and the NH&MRC.²⁶

Hospital based research institutes and independent institutes are not eligible for DEETYA funding.

²⁴ see Glossary of Terms.

²⁵ NH&MRC grants usually specify that infrastructure funding for health and medical R&D must be provided by the institution.

²⁶ South Eastern Area Health Service (SEAHS), 'Draft Research Position Paper', A Resource Document for the SEAHS, February, 1998.

**Access to
Infrastructure
Funds**

Granting bodies generally provide funds on the assumption that the institution provides infrastructure for research.

R&D groups which have no or limited access to infrastructure grants include:

- independent institutes which receive NH&MRC Block Grant funding (these grants do not provide for infrastructure funding)
- research groups located in public hospitals and in universities.^{27 28}

NSW Health is of the opinion that researchers in small research organisations (especially those in rural settings) and Australian researchers (compared with overseas researchers) are also disadvantaged in obtaining infrastructure.²⁹

2.5 Evolution of the IGP

The initial proposal for the IGP identified two groups of R&D organisations that would be eligible for IGP funding, namely:

- autonomous research institutes
- research institutes within Area and District Health Services.³⁰

Clinical Research

Discussions with the research community emphasise the need for the IGP to consider the importance of funding clinical research. Clinical research is important because it :

- can utilise results to improve patient care while students are able to learn from research undertaken in a clinical setting³¹
- is difficult and expensive to undertake.³²

²⁷ These groups may receive operational grants which do not provide infrastructure funding. They are not eligible for DEETYA funding.

²⁸ These groups may not be allocated DEETYA infrastructure funds in accordance with their research activity. In addition, any ARC funds they receive would not necessarily cover infrastructure.

²⁹ NSW Health Submission to Wills Inquiry, May 1998.

³⁰ In addition, some seeding funds were to be available to assist new institutes or institutes undergoing change.

³¹ see NSW Health's Health Economic Reform Committee, Working Party on Teaching and Research, 'Recommendations on the Teaching and Research Program and Funding Arrangements', Final Report, June 1996.

³² The Resource Allocation Formula (RAF) used by NSW Health 'determines the levels of operating funds for Area Health Services in NSW. There is a teaching and research component of the RAF which, although difficult to estimate, may be worth \$200 million per annum.' NSW Health Submission to the Wills Inquiry, May 1998.

To encourage clinical research ‘*ad hoc consortiums between Universities, Research Facilities and areas of clinical practice*’ should be encouraged by the IGP.³³

Public Health

Submissions to NSW Health during the formation of the IGP raised a concern that the program would not balance funding to organisations which conducted biomedical research and funding to organisations which conducted research into public and community health, health systems etc. Organisations undertaking the latter kind of research tend to be located in universities rather than in independent institutes.

Eligibility for Funding

The final outcome was that to be eligible for IGP funding R&D organisations had to be located:

*...within or demonstrably affiliated with the NSW health system. University departments which are not linked with health services are not eligible.*³⁴

Based on these eligibility criteria, three kinds of research organisations (which were to be eligible for infrastructure funding) were identified and classified in streams:

Streams

Stream One:

Independent institutes accredited by the NH&MRC, which have attracted peer-reviewed grants totalling an average of at least \$1m per annum since 1992.

Stream Two:

Established research organisations primarily concerned with clinical and/or biomedical research, which have attracted peer-reviewed grants totalling an average of at least \$350,000 per annum in 1994-96, and/or employ at least 20 research staff.

Stream Three:

Research organisations or consortia primarily concerned with R&D in population health, the organisation and delivery of health services (including rural health), health economics and related fields.

³³ D. Horvarth Submission to NSW Health 15 November 1995.

³⁴ *Application Kit*, p.5.

Ineligibility for Funding

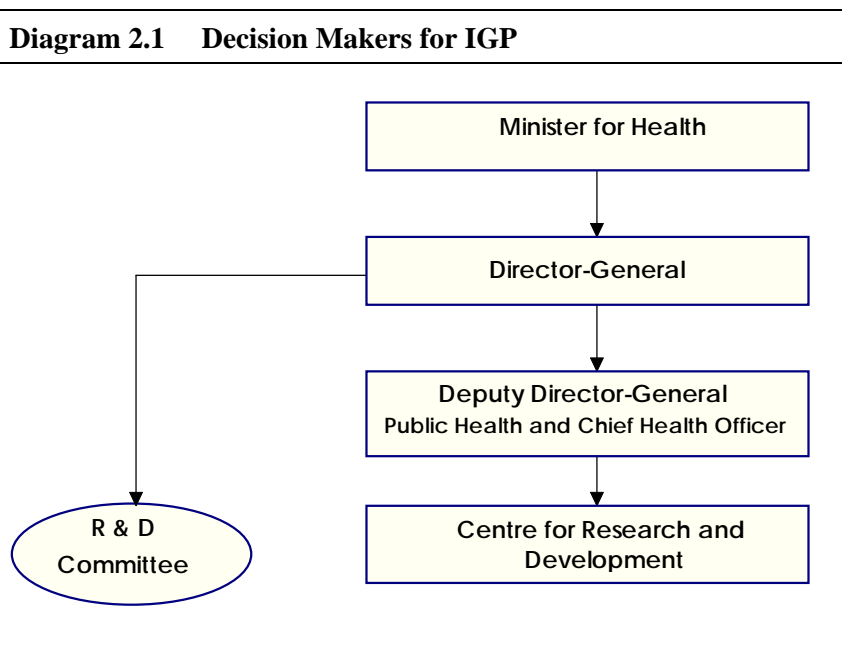
Specific R&D groups ineligible for infrastructure funding are:

- small local research groups located in clinical, laboratory or other service departments in hospitals
- loosely affiliated small research groups *‘which do not satisfy eligibility or selection criteria individually, but represent themselves as aggregate entities for the purpose of fulfilling the criteria.’*³⁵

Selection Criteria

Selection criteria for the three streams are that an applicant:

- is required to have a research program
- must have attracted peer-reviewed grants
- must have a research program that accords with priorities
- must have demonstrated:
 - ◇ an impact on scientific knowledge, health policy and/or practice
 - ◇ links to scientific community
 - ◇ links to NSW health system.



- Note:**
- (1) R & D Committee advises NSW Health on development, implementation and evaluation of R & D policies. R & D Committee advised on IGP criteria.
 - (2) Centre for R & D assesses IGP applications.
 - (3) Minister approves successful applications.

³⁵ *ibid.*, p.4.

3. IGP and Health Priorities

3.1 Introduction

This chapter examines the issue of how the IGP addresses health priorities and what constraints exist in addressing longer term strategic R&D issues.

3.2 R&D Health Priorities

NSW Health Goals NSW Health goals are to:

- ensure better health for people in NSW
- achieve equity of access to comprehensive health services
- improve the quality of services.

The first goal seeks to ensure better health for people by:

- focusing on the major causes of death and disability³⁶
- preventing and managing infectious disease
- developing and implementing policies to improve environmental health
- improving mental health
- improving the health of population groups with special needs.³⁷

The second goal seeks to achieve equity of access to comprehensive health services through:

- improving direct health services
- points of intervention in the health care process³⁸
- rural and community based health services.

The third goal aims to improve the quality of service by strategies targeting workforce issues, standards, consumer participation and research and information.³⁹

³⁶ These are coronary heart disease, cancer, injury, mental health, diabetes.

³⁷ This includes Aboriginal people, women, men, children and young people, older people, disabled and those from non-English speaking backgrounds.

³⁸ These include health promotion, early intervention, treatment, rehabilitation, palliative care, research and training.

³⁹ NSW Health *Caring for Health: The NSW's Government's Vision for Health*, 1995.

IGP Priorities

NSW Health identified content areas for the IGP which reflect these priorities. They are:

Health Content Areas:

- a range of diseases including cardiovascular disease, cancer, mental health, injury, asthma, diabetes.

Health Problems of Specific Populations:

- Aboriginal and Torres Strait Islanders
- rural and remote populations
- the aged.

Health System Issues:

- management of resources
- mechanisms for promoting equity of access and equity of outcomes
- organisation and delivery of health services for rural and remote communities
- research on the impact of policy
- improved mechanisms for implementing the results of health and medical research.⁴⁰

In 1996-97 56 applicants applied for research funds.⁴¹ Thirty-one were successful, receiving approximately \$11m.

A majority of both successful (28 of 31) and unsuccessful (17 of 24) applicants undertook research that aligned with health priorities. Table 3.1 below indicates the numbers in each category by health priority area and topic.

⁴⁰ The IGP was to encompass the full spectrum of and disciplines in the health system and in all fields of medical and health research. This was to include biomedical, clinical, epidemiological, operational (health services, health policy) and social determinants of health.

⁴¹ Two applications from the same institution were considered as one by NSW Health, resulting in 55 applications for assessment.

Table 3.1: Successful and Unsuccessful Applicants by Health Priority Area and Topic		
Priority Area	Successful*	Unsuccessful*
<i>Health Content Areas</i>		
cardiovascular disease	9	4
cancer	16	6
mental health	5	3
injury	2	4
asthma	7	6
diabetes	3	2
perinatal mortality	5	2
developmental disorders	3	1
blood borne infections	1	1
lab surveillance of infectious diseases	5	2
nosocomial infections	1	1
immunisation	4	3
gene therapy	11	3
<i>Population Health Problems</i>		
Aboriginal & Torres Strait Islanders	3	3
Rural & remote populations	2	3
aged	5	2
<i>Health System Issues</i>		
management of resources	6	2
equity and access	3	1
rural services	2	2
impact of policy	2	1
mechanisms for improving results	1	1
Total Applicants Aligning with Health Priorities	28	17

Source: IGP Applications

Note: *applicants' research may align with more than one health priority area

Findings

The IGP does not balance or give a weighting to particular health content priority areas. Some health priority areas, for example population health problems and health system issues do not appear to be addressed to the same extent as health content, that is, physical health issues.

The institutes in Streams One and Two are regarded by NSW Health as 'autonomous' institutes. Their R&D tends to be focused on basic biomedical research in areas such as cancer, cardiovascular disease.

Approximately half of the 31 successful applicants undertake research in cancer (see Table 3.1).

The previous grant program, the External Grants Program, also allocated most funds to biomedical research. The difference between the IGP and the External Grant Program is that:

- the External Grants Program did not fund infrastructure
- the IGP has more funds to allocate
- there is a new allocation for public health (\$1m).

Conclusion

As explained in Chapter One, NSW Health in the short-term sought to build on existing R&D strengths by making:

... use of R&D resources during the period 1996-2000 as effective as possible, based on a relatively superficial contemporary determination of priorities.^{42 43}

NSW Health sought to achieve this goal initially by funding larger, independent institutes. Because these institutes conduct research in particular health content areas, a need still exists to:

- review the balance of funds between basic, clinical and public health and health services research
- decide which health content areas need to be given a priority.

In doing so, NSW Health will need to balance investigator-driven research with directed research and has already begun to address this issue.

⁴² *Discussion Paper*, op. cit., p.21.

⁴³ The longer term component of the strategy will 'assess the future R&D needs of the health system to the year 2010 and provide an implementation plan based on a much more sophisticated determination of priorities', *Discussion Paper*, ibid., p.3.

3.3 The Need for a Longer Term Strategic Plan

Government's Role in R&D

There are two opposing views as to whether governments ought to be involved in setting strategy and whether R&D should be centrally planned by government.

On the one hand, there is a concern that directions from government may dampen opportunities for the creation of new ideas, approaches and innovative solutions to research questions by investigator-driven research.

On the other hand, there is a view that R&D needs to have a strategic intent in order to improve the health status of the population and to make health services more effective. A major concern has been that for research to be relevant to decision-making, strategic leadership is needed to assist researchers target their efforts at 'problems that require a solution.'⁴⁴

A Strategic Approach

A strategic approach to health and medical R&D would include:

- identifying present and future health needs to inform policy and service planning
- considering what research questions and issues need to be addressed
- creating a sense of direction by bringing together key R&D players, namely industry, NH&MRC, ARC, CSIRO etc⁴⁵
- developing a R&D policy which is informed by social research and evaluation of major changes in health policy⁴⁶
- formulating a multidisciplinary and interprofessional approach to R&D
- having a clear set of research priorities which drive programs and funding from the 'top down' rather than 'bottom up'. The R&D programs then are not simply a combination of currently disjointed funding.⁴⁷

⁴⁴ J. Frenk 'Balancing Relevance and Excellence: Organisational Responses to Link Research with Decision-making' based on presentation to International Symposium *New Directions in Health Care: From Research to Action* Mexico City 4 July 1986, p. 1397.

⁴⁵ Professor S. Leeder, 'Breaking through to Better Health' Eleanor Shaw Lecture, 30 August 1994, p.17.

⁴⁶ Professor S. Leeder, *ibid.*, p.18.

⁴⁷ National Academy of Sciences, National Academy of Engineering, Institute of Medicine and National Research Council *Allocating Federal Funds for Science and Technology: Committee on Criteria for Federal Support of Research and Development*, National Academy Press, Washington, D.C., 1995.

Findings

The *Discussion Paper* envisaged that a planning process to implement a longer term R&D strategy would assist in defining clearer R&D goals, timeframes and targets. NSW Health is committed to pursuing their planning process.

Issues the process might address include:

- significant research questions
- gaps in R&D which need to be addressed
- a clear set of R&D goals, priorities and expected results
- what balance is required between different types of research
- targeting those areas in which NSW has the competitive edge in terms of R&D and which also align with health priorities
- identifying areas where innovation in R&D should be fostered.

Conclusion

There is now opportunity for NSW Health to be more explicit about how the IGP can align more closely with health priorities in terms of how the IGP:

- seeks to reflect or actively address key health priorities
- aims to achieve comprehensive coverage of priorities
- intends to rank R&D health priorities for funding
- will address emerging priorities.

It is understood that NSW Health will conduct a workshop later this year to address these issues.

The planning process should consider the extent to which the IGP and other NSW Health R&D programs should address:

- lifestyle causes as predominant risk factors and thus are contributors to diseases such as cancer and cardiovascular disease⁴⁸
- an apparent imbalance between 'endstage treatment priorities compared to early intervention and prevention strategies'⁴⁹
- emerging issues and technologies.

⁴⁸ D. Reilly Richmond Health Service Submission to NSW Health October 1995 p.1.

⁴⁹ D. Reilly loc. cit.

3.4 Recommendations

It is recommended that NSW Health:

- pursue its strategic planning process to identify longer term R&D priorities, taking into account the need to balance investigator-driven research with directed research. NSW Health should request the assistance of the R&D Committee with this process
- weight priority areas as identified by the planning process.

4. IGP Criteria

4.1 Introduction

To achieve a more rigorous and systematic approach to R&D funding, NSW Health introduced eligibility and selection criteria for IGP funds.

This chapter examines the basis of decision-making, structures and mechanisms, including:

- how the criteria were developed and used in support of decision-making
- the number of criteria
- the adequacy of criteria definitions
- compliance with/ use of criteria
- weighting of criteria
- ranking of applications
- use of panels.

4.2 Eligibility Criteria

All applicants must meet generic eligibility criteria (Table 4.1).

Each stream has additional eligibility criteria to be applied (Appendix 4).

A key criterion is ‘sufficient independence’.

Stream One has more rigorous requirements for organisational independence compared to other streams. One of these requirements was that applicants should have an independent board of management and be accredited by the NH&MRC as an independent institute.

Streams Two and Three did not require additional ‘independence’ criteria.

Table 4.1 IGP: Eligibility Criteria

Eligibility criteria required organisations to:

- be classified as Streams One, Two or Three
- have R&D as their primary function
- be located in NSW
- be part of, or have a demonstrated track record of affiliation with, the NSW Health system
- constitute identifiable entities with sufficient independence to determine and implement their own research directions and policies, have identifiable budgets for infrastructure, have control over their budgets, and can account for the use of granted funds
- demonstrate an intellectual interaction with one or more universities
- have an appropriately qualified and experienced director
- have policies which support good scientific practice (for example, comply with NH&MRC guidelines).

4.3 Selection Criteria

Selection criteria were to be applied to applications for grants once applicants had met eligibility criteria. These selection criteria are set out in Table 4.2.

Table 4.2 IGP: Selection Criteria

Applicants are required to demonstrate:

- the existence of a research program
- a performance record in terms of publications, funds attracted including grants
- research which has significant impact
- links to the scientific community and the health system
- capital investment by the NSW Government (for Stream One).⁵⁰

⁵⁰ This means that NSW Health has provided funds for building the research institute.

4.4 How Criteria were Developed

The R&D Committee advises NSW Health on, among other things, R&D policy and funding principles and on ways to determine R&D priorities.

The IGP criteria, drafted by some members of the R&D Committee⁵¹ following a consultative process involving the research community, were endorsed subsequently by the Committee. The criteria were modelled on National Health and Medical Research Council (NH&MRC) Guidelines.

Conclusion

While members of the R&D Committee were not involved in the selection of successful applicants a number of committee members, as applicants, did receive a grant from the IGP. This situation gives rise to a potential or apparent conflict of interest. It is important that the process of developing and finalising the criteria be, and be seen to be, free of potential conflicts of interest.

4.5 The Number of Criteria

The IGP has eight core eligibility criteria and five selection criteria. Each stream has additional eligibility and/ or selection criteria.

Finding

There appears to be some duplication between eligibility and selection criteria, for example, affiliation with the health system (eligibility criterion) could be regarded as being the same as links to the health system (selection criterion). Intellectual interaction with a university (eligibility criterion) could be seen as being the same as links to the scientific community (selection criterion).

Conclusion

It is considered that the number and complexity of criteria mitigates against the efficiency and effectiveness of the decision-making process.

⁵¹ R&D Advisory Committee Minutes Meeting No. 2, 1 April 1996.

4.6 Adequacy of Definitions

It will be recalled from Table 4.1 that Streams Two and Three applicants are required to demonstrate sufficient independence to determine and implement their own research directions and policies, have identifiable budgets for infrastructure, have control over their budgets, and can account for the use of granted funds.⁵²

Applicants are not required to be independent in the sense of being incorporated associations or of being constituted under an Act of Parliament (unlike Stream One). Applicants are required however to identify as a research entity distinct from clinical, laboratory or other service departments in Area Health Services.

Findings

Failure to meet the ‘independence’ criterion was a major reason for lack of success in obtaining a grant from the IGP.

Reasons	Number of Applicants
Lack of independent organisational structure	14
Funded by university/ health system/ or other state government source (this may imply an organisational affiliation)	12
No or poor performance record	6
R&D not a primary function	5
Commonwealth funded	4
Directorship status unclear	3

Source: IGP Applications

⁵² IGP Application Kit, p.7.

‘Sufficient independence’ was achieved by successful institutes in Stream One by:

- virtue of being incorporated with appropriate legislation for companies (or incorporated associations)⁵³
- having organisational independence separate from a host organisation (that is an organisation which may administer funds for an institute or may be the employing body for staff)
- usually having a structure with:
 - ◊ a non-executive board which decides on research policies and direction
 - ◊ a structure which gives primacy to research activity.

It was noted that:

- some unsuccessful applicants rejected for organisational reasons demonstrated a reasonable degree of independence in determining their own research policies
- a number of successful applicants did not demonstrate independent organisational status although had a degree of autonomy over their research policies.

Seventeen of the 31 successful applicants and 6 of the 24 unsuccessful applicants did not demonstrate total control over their budgets and similar numbers did not appear to have control over their infrastructure budgets.

Some unsuccessful applicants (and Area Health CEOs) interpreted failure to obtain a grant as being due to the quality of their research because reasons for failing to obtain a grant were not automatically communicated to them. Where applicants sought an explanation, they were accommodated. This issue is discussed in section 5.6 *Communication with Applicants*.

Conclusion

It is considered that the absence of a clear definition of ‘sufficient independence’ left compliance with this criterion open to wide and inconsistent interpretation.

If the criterion of independence is to be maintained, then requirements in terms of governance arrangements and organisational/management structure need to be made explicit.⁵⁴

⁵³ Most institutes in Stream One are companies limited by guarantee. One institute operates under its own legislation.

⁵⁴ This should include a statement/ policy on the preferred location of the unit which decides research policy and direction and the body which raises funds.

4.7 The Decision-Making Process

Compliance/ Use of Criteria	Grants programs that have eligibility and selection criteria normally follow a sequential process in assessing applications. That is, applications are first assessed in terms of eligibility criteria and then evaluated in terms of selection criteria.
Finding	<p>The IGP decision-making process does not follow this sequential process. With the exception of one application that was reallocated to a larger organisation with which it was associated, all applications were considered for funds. This implies that all applicants were considered eligible when in fact a number were considered ineligible on the grounds of lack of independence.</p> <p>Hence the confusion in the minds of some applicants who, in the absence of feedback, viewed failure as being due to qualitative aspects of their research (this issue is discussed at 4.6 above and at 5.6).</p>
Weighting Criteria	Grants programs using criteria usually assess applications by a scoring or weighting process.
Finding	<p>From the information provided by applicants to NSW Health, it would appear that some successful applicants did not demonstrate compliance with eligibility criteria. Only 10 of the 31 successful applicants clearly demonstrated compliance with all eligibility criteria while only one unsuccessful applicant did so. Most applications were rejected on grounds of lack of independence.</p> <p>Although some candidates did not demonstrate compliance with all the criteria, the criterion of ‘independence’ received a greater weighting compared with other criteria.</p>
Ranking Applications	Granting bodies such as NH&MRC rank applicants after considering their compliance with criteria. The IGP does not rank applications.
Finding	Applications are not ranked or funded according to compliance with criteria. ⁵⁵

⁵⁵ For applicants in Streams One and Two grants were allocated on a certain dollar basis according to levels of peer reviewed grants. Most Stream Three applicants each received \$90,000. A few applicants were treated as special cases and received varying amounts.

The IGP decision-making process would be a more rigorous, equitable and transparent process if applications were ranked according to compliance with criteria. While this might seem an administrative burden it is common practice in grant giving processes.

Use of Panels

The *Discussion Paper* recommended an interstate selection panel be appointed to assess applications and make recommendations to the Director-General, NSW Health and the Minister.

A panel was not appointed on the grounds that:

- a criterion-based selection process was used to assess applications
- there was substantial peer input into the design of selection criteria
- eligibility and selection criteria were endorsed by the NSW R&D Committee.⁵⁶

A potential conflict of interest issue in panels can arise where there is a small number of researchers in a field. For example, a conflict of interest can be created when the group recommending or deciding the framework is also likely to benefit from the funding program.

Procedures for dealing with conflicts of interest include:

- publishing conflict of interest rules
- reviewers asked not to participate in the review of applications involving personal conflicts
- reviewers from same institution as the applicant being excluded from the panel.

Finding

NSW Health officers were occasionally consulted about some applications. The basis on which some applications were referred for comment and review is not transparent.

Conclusion

There is a need to have a more rigorous, independent and transparent decision-making process, especially in terms of compliance with eligibility criteria. One way this could be achieved is by the use of assessment/ review panels.

⁵⁶ Centre for R&D, internal memo, 1 December 1996.

4.8 Recommendations

It is recommended that NSW Health:

- review the appropriateness and definitions of eligibility and selection criteria
- reduce the number of, and duplication in, eligibility and selection criteria.
- consider explicitly weighting criteria, if appropriate
- adopt a process of ranking applications according to compliance with criteria
- use assessment/review panels first to determine eligibility for the IGP before selection on merit is considered
- issue guidelines / procedures for managing conflict of interest on panels.⁵⁷

⁵⁷ These arrangements could take the form of: special ad hoc committees comprising experts in content and experts in research methodology; consultants to assist panels; use of ‘scrutineers’ to ensure procedures are followed; and removal of names of researchers from applications when proposals being reviewed.

5. Other Research Issues

5.1 Introduction

This chapter examines other issues relevant to R&D and the IGP and include:

- fragmentation of R&D
- public and private sector funding of R&D
- selection
- funding and peer review
- communication with applicants
- accountability.

5.2 Fragmentation of R&D

The NSW *Health Discussion Paper* identified fragmentation of the health and medical research effort as a weakness.

There is a view that competition between researchers promotes excellence in research. There is an opposite view that competition rather than collaboration between research groups in similar fields may:

- reduce the relevance and impact of research⁵⁸
- result in inadequate approaches to the research of health problems especially in interdisciplinary terms
- minimise research effort
- increase inefficiency in terms of technical and core support.

Greater collaboration of research effort to overcome these problems can be achieved by promoting:

- interdisciplinary efforts⁵⁹
- R&D arrangements across organisational barriers (including the concept of an 'institute without walls')⁶⁰
- R&D that examines a specific problem from different levels or perspectives:
 - ◇ subindividual level-biomedical research
 - ◇ individual level-clinical research
 - ◇ population level-epidemiology research
 - ◇ societal level-health systems research.

⁵⁸ R. Sanson-Fischer Submission to NSW Health 7 November 1995.

⁵⁹ Interdisciplinary research should be distinguished from *multidisciplinary*-the disciplinary components are performed independently and joined externally through appropriate editorial linkages and from *transdisciplinary*-involves the development of an overarching paradigm encompassing a number of disciplines.

⁶⁰ F. Rossini and A. Porter 'Interdisciplinary Research: Performance and Policy Issues', *SRA Journal*, Fall, 1981, p.12.

The *Discussion Paper* explains that the IGP is a competitive program but at the same time has as an aim to foster collaboration between researchers.

However, the decision-making process resulted in there being no competition between applicants for Stream One funds in that all applicants were deemed to have met eligibility and selection criteria. The success rate for Stream One is 100 per cent, while for Streams Two and Three, it is 52 per cent (see Table 5.1).

	Stream 1	Stream 2	Stream 3	Total
Original Applications	7	21	28	56
Eligible Applications after Review	5	23	*27	**55
Successful	5	10 (+2)	11 (+3)	31
% of Applications before Stream Reallocation	71	57	50	55
% of Applications after Stream Reallocation	100	52	52	56
% Success Excluding Special Cases and After Stream Reallocation	100	43	41	45

Source: NSW Health Administration File

Note: * two Stream Three applicants were treated in some NSW Health papers as one as they were awarded a grant on the basis they became a consortium; in this performance audit they are treated as two applications

** NSW Health reallocated one Stream One application into its host institute, making 55 applications

Both successful and unsuccessful applicants had strong co-operative research arrangements with both the health research industry and with universities (Table 5.2).

Links	Successful	Unsuccessful
To Universities	30	21
To health research bodies (total)	27	14
In NSW - research link	26	14
Nationally - research link	23	8
Internationally - research link	24	8
Total Applicants	31	24

Source: Application forms

Note: *Some applications may have had missing data on some items

When the criterion of collaboration was used, the reasons for differentiation between proposals was not clear, as indicated in the examples below.

The IGP provided seeding grants to two research groups to form a consortium. The consortium was initiated by NSW Health. Funding was provided on the condition that the two groups develop a joint research strategy and '*establish a single management committee and a single scientific committee.*'⁶¹ The two groups involved were part of Area Health Services.

Another proposal for a consortium was not funded on the basis that the members functioned as part of the university or Area Health Service.

Conclusion

The Department needs to resolve the tension between the apparently conflicting aims of competition and collaboration between researchers.

⁶¹ NSW Health IGP administrative files.

5.3 Public and Private Sector Funding of R&D

Advantages of Private Sector Funding

There are conflicting views as to what ‘balance’ could or should be achieved between government funding of research and industry (private sector) funding of research. Advantages of having the private sector contribute to R&D funding are seen to include:

- increasing the relevance of R&D
- ensuring applicability of R&D effort.

Disadvantages of Private Sector Funding

Where a R&D organisation in receipt of public funds also receives substantial levels of private sector funds, there is a risk that the organisation may:

- become more interested in profit than in R&D where ‘*it is most valuable to the public interest and to the long-term advancement of knowledge*’⁶²
- focus on ‘cures’ rather than on prevention (with an emphasis on products and services, for example, drugs) rather than changes in behaviour⁶³
- skew its R&D toward only those activities that lead to commercial benefits for industry. Such R&D may not benefit the population’s health. This danger has been referred to as ‘*the possibility of private capture of the public research process*’⁶⁴
- not be able to be fully accountable for the *public* funds it receives because of considerations of commercial-in-confidence issues
- not have control over its research agenda and the science itself is compromised as Leeder explains:

*Any commercial venture or any form of partnership inevitably compromises the autonomy of the partners...Under those circumstances medical and health researchers need to be careful that they understand the nature of the compromise and that it doesn’t overturn the most fundamental value that’s driving the research, otherwise there’s no point in doing it.*⁶⁵

⁶² P. Baird ‘Funding Medical and Health-Related Research in the Public Interest’, *Can Med Assoc J*, 1 August 1996, p.299.

⁶³ Baird, *ibid.*, p.300.

⁶⁴ Baird, *loc. cit.*

⁶⁵ Professor S. Leeder, ‘Medical Research in Australia’, interview with Ray Moynihan, Radio Australia, 25 April 1998.

Leveraging Private Sector Funds

There is a strongly held view in the health and medical research community, that, well managed, private sector funding is to be encouraged and can be leveraged by providing public sector funds to R&D organisations. Mr Peter Wills, Chair of the NH&MRC Strategic Review considers that

*investigations by the Health and Medical Research Strategic Review over the past six months have shown that Australia has traditionally been very good at research, but very poor at capturing the value of intellectual property... Any move that enables us to reverse this situation, and to top up government funding with private sector money, is commendable.*⁶⁶

The Product

At the heart of the debate is the issue as to what the product of R&D is or ought to be. There is, for example:

- a scientific view that the purpose or product of research ‘is not so much to satisfy the demand for knowledge as to increase it, since good projects tend to give rise to new questions.’⁶⁷ The publication of articles is a means by which to influence ideas. For policy makers, research needs to have an impact on the policy decisions
- a view that the product of research is conceptualised in terms of ‘things, particularly those where there is a commercial opportunity, and therefore relies on private goods’⁶⁸
- a perspective that the product of research can be ‘public goods’ which are not commercially exploitable but which contribute to health (or prevent ill-health), for example environmental research.⁶⁹

A criterion for receiving IGP funds is impact of R&D. Commercial development activity and outcomes are a means to demonstrate an impact of R&D. This aspect is included in selection criteria for Streams One and Two. Applicants in these streams are asked also to provide information on income from industry grants and commercialisation of research findings (see Table 3.1).

⁶⁶ P Wills ‘Need for R&D culture’ Chair, Health and Medical Research Strategic Review, *Australian Financial Review*, Letters to the Editor, 22 October 1998.

⁶⁷ J. Frenk, op. cit., p.1398.

⁶⁸ J. Hall, Submission to NSW Health 2 November 1995.

⁶⁹ See N. Black and N. Mays, ‘What is development’ *J Health Serv Res Policy* Vol 1, No.4, October, 1996, pp.183-184 draw a distinction between an industrial model of development (where the product is seen as a way of producing, delivering and marketing your application) and an implementation model (the product relates to implementation of research findings).

Findings	<p>Not all successful and unsuccessful applicants had links with industry.</p> <p>A number of successful IGP applicants are entering into joint ventures and are involved in extensive commercialisation of their R&D outputs. Thirty-five applicants (21 successful and 14 unsuccessful) had such links. Twenty applicants (11 successful and 9 unsuccessful) received funding from commerce and industry in 1994-95 (Table 5.3).</p> <p>Lack of industry links was not used as a basis to reject applications.</p>
Industry Links Supported	<p>NSW Health has indicated it has obligations to researchers under the Service Agreement in that NSW Health would <i>'work with research organisations to help them achieve the benefits of commercialisation of research advances'</i> through the development of a research transfer plan. This obligation has yet to be fulfilled.</p>
Accountability	<p>The nature and degree of interaction with industry has implications for accountability.</p> <p>Patent/ intellectual property arrangements may limit sharing of research findings. IGP recipients may not be able to participate fully in policy and other NSW Health committees as required in the standard Service Agreement. Commercial-in-confidence considerations prevent full disclosure of R&D findings and as a result, some successful applicants have their Service Agreements amended to accommodate this.</p> <p>NSW Health has commissioned a paper on intellectual property which should clarify some aspects of the conditions under which R&D organisations with significant industry links and funding might receive IGP funds.</p>
Conclusion	<p>A clearer policy statement and rationale is required for the kinds of industry links the IGP wants to encourage.</p>

5.4 Selection

IGP Merit or Performance Criteria

The selection criteria for the IGP have a broadly defined concept of performance. The criteria encompass academic performance, operating efficiency and impact on health decision-making.⁷⁰

Source of Funds	Successful Applicants Receiving Other Funds	Successful Applicants Not Receiving Other Funds	Total \$ Value \$000	Unsuccessful Applicants Receiving Other Funds	Unsuccessful Applicants Not Receiving Other Funds	Total \$ Value \$000
NH&MRC	22	6	9,820	10	8	5,770
Other Commonwealth Government	9	18	865	10	8	4,880
NSW Health	6	21	1,158	7	10	638
Other State Government Sources	12	15	2,336	5	11	396
Area Health Services	4	23	200	6	11	922
University	9	18	753	6	11	269
Foundations	15	13	2,419	7	10	360
Commerce/ Business	11	16	2,140	9	7	3,079
Fund Raising	7	20	438	6	12	1,495
International Bodies	5	22	626	3	13	636
Other	10	17	1,794	9	8	1,638
Total Sample*	31			24		

Note: * total samples will be larger than responses because of item not applicable (no funding received), missing data or data not available

The generic criteria for 'academic' performance criteria include:

- publications
- postgraduate education outcomes
- peer-reviewed grants awarded
- other public sector research funding awarded
- other funds for research attracted.

⁷⁰ This criterion is duplicated under 'Impact criteria'.

Academic merit is often determined using a competitive review process known as peer review. Peers (these may be individuals or panels) are charged with the responsibility of judging whether the research proposal reflects excellence in terms of content and methodology.⁷¹

Criteria relating to the efficiency of the organisation are specified as a second measure of performance and include:

- staffing and operating costs to research outputs (publications and higher degree completions)
- the value of peer-reviewed grants
- the value of other research funds attracted.

A third aspect of performance focuses on demonstrated ability of the organisation to act as a resource to health professionals.

Findings

Merit or performance criteria have three aspects: academic performance, efficiency and acting as a resource to NSW Health. A considerable proportion of applicants are attracting funds from other peer-reviewed and non-peer-reviewed sources. Academic performance was used to reject six applications.

Conclusion

The IGP seeks to enhance the capacity of health and medical research organisations by providing infrastructure funding which acts as leverage for attracting other funds particularly from the private sector.

However, it is important that in providing IGP funds, organisational efficiency and impact which did not feature as reasons for success or failure in obtaining a grant are taken into account.

⁷¹ Frenk op. cit., p. 1397.

5.5 Funding and Peer Review

The level of peer-reviewed grants attracted by applicants was used to determine the level of IGP funds for Streams One and Two.

This method was used despite concerns raised during the development of the IGP highlighting problems about using peer review per se to judge performance and funding, especially for public health and health services research.⁷²

The problems highlighted by those making submissions to the NSW Health on the proposed IGP included:

- new researchers trying to attract funds⁷³
- new research areas not targeted by funding bodies or where there may be no peers⁷⁴
- multidisciplinary projects which may span disciplined based grant programs
- those professional groups just entering R&D
- those exploring new avenues of inquiry or developing new techniques.

Conclusion

There is a tension between using peer-reviewed funding obtained to determine the basis for allocating funds under the IGP and achieving equity and fairness (an objective of the IGP). Problems with relying on peer review to determine merit have been well documented by the ARC and in the international literature.

In addition there is a tension between merit and 'need' for funds arising from inadequacies in other funding programs (where no financial assistance is provided for infrastructure).

The method used to determine funding needs to be reviewed to take into account a concept of merit or performance that is appropriate to the nature of the R&D and that reflects equity and fairness (among the objectives of the IGP).

⁷² see also ARC *The Peer Review Process*, Commissioned Report No. 54, Prepared by Dr. F Wood, January 1997, AGPS, Canberra and J. Luukkonen-Gronow 'Scientific research evaluation: a review of methods and various contexts of their application' *R&D Management*, 17,3,1987.

⁷³ There is considerable debate in the R&D field as to whether proven researchers with a successful track record or proposed projects should be funded.

⁷⁴ In health, this may include researchers who may be funded by the Commonwealth Department of Human Services and Health.

5.6 Communication with Applicants

Better Practice

Better practice in grant giving processes recommends protocols for communicating with applicants.⁷⁵

US research organisations have feedback processes in place such as sending:

- the principal investigator a copy of summary statement with percentile ranking, priority score, and narrative evaluation (National Institute of Health (NIH))
- verbatim reviews without the reviewer's name accompanied by a program officer's explanation to the applicant (National Science Foundation(NSF))
- applicants a letter detailing reasons for lack of success and suggesting improvements if the application were resubmitted (National Endowment for the Humanities (NEH)).

Findings

There is no formal system in place for applicants wishing to seek an explanation of aspects of the program or for clarifying their application. Those wishing to do so were accommodated.

Applicants are not automatically advised of reasons for failing to receive a grant. Again, where applicants sought an explanation for failure to receive a grant, they were accommodated.

Unsuccessful IGP candidates were sent a standard letter indicating that they could apply again. There was no reference to actual reasons for rejection in terms of eligibility or selection criteria.

Reports to the Minister for Health confirmed that most reasons for rejection related to organisational arrangements not to quality of research. However, some applications were also rejected on other grounds.

⁷⁵ see NSW Audit Office of NSW, Performance Audit Report *Ethnic Affairs Commission: Administration of Grants*, The Audit Office of NSW, Sydney, 1995.

A number of unsuccessful applicants interviewed:

- were unaware why they were ineligible/unsuccessful on organisational grounds. As indicated in Chapter Four, these applicants interpreted this lack of success as meaning their research was of poor quality. Researchers in receipt of NH&MRC funds were particularly confused about reasons for rejection
- indicated they would apply again. This would seem to be a waste of effort if organisational reasons were the true reasons for being unsuccessful
- were aware of the confusion over the interpretation of independence and were able to cite research units with similar organisational arrangements which were treated differently.

Conclusion

Formal protocols and feedback mechanisms should be introduced to communicate with applicants to ensure accuracy, consistency and fairness in feedback and treatment.

Developing procedures to address these issues would assist applicants and help to improve the quality and transparency of decision-making should be introduced for applicants:

- seeking an explanation of aspects of the program
- wishing to clarify their application
- wanting reasons for failure to obtain a grant.

Appeals Mechanisms

Overseas granting bodies have appeals mechanisms for applicants, for example:

- the NIH system allows for a principal investigator to request corrective action if an error is found
- NSF provides for a response to an assessment of a grant application from the principal investigator. The investigator can ask the NSF for reconsideration of the application
- the NEH system permits the principal investigator to request written comments after decisions.

Findings

The IGP has no appeals mechanism. However, as indicated above, those wishing to obtain reasons for their failing to receive a grant were accommodated.

Conclusion The introduction of an appeals mechanism would assist the transparency of the process.

5.7 Accountability

There are two aspects to accountability. The first is accountability for public expenditure of the IGP by NSW Health. The second is accountability by successful applicants.

A major issue in recent R&D debates has been how to ensure that R&D provides value for the public dollar. NSW Health has instituted a Service Agreement between itself and successful applicants to improve accountability. This Service Agreement contains obligations on both NSW Health and successful applicants.

The Service Agreement, including the form of reporting, was arrived at after consultation with the research community. Individual grant recipients were able to, and some did, negotiate changes to the Service Agreement.

Findings The Service Agreement, in its standard form, is quite extensive and could benefit from focusing on essential requirements such as determining conditions as to how IGP funds are to be spent.

The Service Agreement requires extensive information about the outputs of R&D but does not require information as to how the grant money was spent.

In some cases applicants requested changes in their Service Agreement because of commercial-in-confidence or other reasons, and were accommodated.

NSW Health has yet to fulfil all of its obligations under the Service Agreement. These include assisting organisations to develop a research transfer plan (item A8 of the Service Agreement) and the production by NSW Health of an annual report so as to provide feedback to research organisations based on the requirements of the Service Agreement (item A3).

The quantity of information required from applicants could be reduced, especially if it is not used for monitoring purposes.

Essential information such as how grant monies are used should be collected.

Evaluation NSW Health has undertaken limited monitoring of the IGP.

Conclusion It is considered that the evaluation of the IGP requires improvement. A process is required to determine whether the IGP is a success. The IGP needs to be explicit as to how success is to be measured.

5.8 Recommendations

It is recommended that the IGP:

- resolve the tension between the apparently conflicting aims of encouraging competition and collaboration between researchers
- give an explicit weighting to collaboration as a criterion in its selection process
- have a clearer policy statement on and rationale for the kinds of industry links it wants to encourage
- require successful applicants to adopt a Code to cover issues such as how projects are managed and how funds received from public sources are spent
- ensure the criterion of fostering collaboration with industry is consistent with other IGP criteria
- ensure the concept of merit or performance is appropriate to the R&D and reflects equity and fairness (among the objectives of the IGP)
- develop a communications policy and protocols on:
 - ◊ processes for clarifying information provided by applicants
 - ◊ how an applicant can discuss required changes to the standard Service Agreement.
- provide a clear and simple application form
- provide feedback to unsuccessful applicants as to:
 - ◊ how a subsequent application can address shortcomings or would not meet criteria
 - ◊ what opportunity exists for appeal and Freedom of Information processes

- supply reasons for adverse decisions
- introduce an appeals panel

- Service Agreement:
 - ◊ reduce the quantity of information required from successful applicants
 - ◊ include a requirement on providing information as to how grant money is spent
 - ◊ ensure that NSW Health meets its obligations

- has a formal evaluation process at the end of its first round to determine whether the IGP has been a success. The process should be explicit as to how success is to be measured.

6. Appendices

Appendix 1: Audit Objectives, Scope, Methodology and Criteria

Objectives	<p>The audit objective was to examine whether the IGP ensured the R&D it funded:</p> <ul style="list-style-type: none"> • was relevant to health needs • reflected health priorities • had impact.
Scope	<p>The audit only examines the IGP. It does not examine other R&D programs within NSW Health nor does it examine Commonwealth R&D programs. It does however recognise the existence of other R&D funding programs and the complexity and impact of funding arrangements.</p>
Methodology	<p>The audit methodology involved:</p> <ul style="list-style-type: none"> • analysis of all applications for the IGP • interviews with 21 successful and unsuccessful applicants • interviews with three Chief Executive Officers of AHS • examination of the literature on the management of R&D • review of key government reports on the management of R&D • interviews with NSW Health staff. <p>The <i>criteria and sub-criteria</i> are listed below (the program refers to the Infrastructure Grants Program).</p> <p>1. Approach to Research</p> <p><i>The research program should support research that is credible and relevant.</i></p> <p>1.1 NSW Health should support organisations which have research as a focus.</p> <p>1.2 NSW Health should support future-oriented, issues based research rather than disciplined-based research.</p> <p>1.3 NSW Health should support/encourage organisations which have a sustained relationship with the health research industry (research seen as a process rather than as a series of projects).</p>

- 1.4 NSW Health should support organisations which have intellectual interaction with a university.
- 1.5 NSW Health should support organisations which have links to industrial/commercial organisations.
- 1.6 NSW Health should support organisations which have links to health policy/decision-makers (health system).
- 1.7 NSW Health should support organisations which can demonstrate independence in the formulation of their policies and research directions.
- 1.8 NSW Health should support organisations which can demonstrate financial control and viability.
- 1.9 NSW Health should support organisations which can demonstrate credibility in the research community.
- 1.10 NSW Health should support organisations which demonstrate accountability in their performance.

2. Program Principles/ Objectives

The research program should have a clear rationale.

- 2.1 NSW Health should have an identifiable research grants allocation program.
- 2.2 The Infrastructure Grants Program should have clear objectives.
- 2.3 The objectives of the Infrastructure Grants Program should be aligned with the objectives of NSW Health.
- 2.4 The objectives of the Infrastructure Grants Program should be aligned with the health priorities of NSW Health.
- 2.5 The Infrastructure Grants Program should have clearly defined funding criteria and guidelines.
- 2.6 Grants should be allocated in accordance with NSW Health's health priorities.
- 2.7 Grants should be allocated in accordance with the objectives of NSW Health's R&D Strategy and Infrastructure Grants Program.

3. Program Administration

The research program should be identifiable and managed effectively and efficiently.

- 3.1 The process for eliciting applications should be simple and streamlined.
- 3.2 Information provided to applicants should be easily accessible, clear and adequate.
- 3.3 Applications should address criteria with little need for follow up to elicit required information.
- 3.4 There should be a process in place for advising applicants of success/lack of success.
- 3.5 There are adequate systems in place for recording processes and decisions.

4. Research Outcomes

The research program should be accountable for performance and outcomes.

- 4.1 There should be adequate performance measures in place to monitor the Infrastructure Grants Program.
- 4.2 Research results should be monitored and reported.
- 4.3 Research results should be disseminated.
- 4.4 NSW Health should have a process in place to assist in disseminating research results.
- 4.5 Research results should be utilised.

Appendix 2: Detailed Recommendations

It is recommended that NSW Health:

- | | |
|---------------------------------------|---|
| IGP Planning and Priorities | <ul style="list-style-type: none"> • pursue its strategic planning process to identify longer term R&D priorities, taking into account the need to balance investigator-driven research with directed research. NSW Health should request the assistance of the R&D Committee with this process • weight priority areas as identified by the planning process. |
| IGP Criteria | <ul style="list-style-type: none"> • review the appropriateness and definitions of eligibility and selection criteria • ensure a concept of merit or performance is appropriate and reflects equity and fairness (among the objectives of the IGP) • reduce the number of, and duplication in, eligibility and selection criteria • consider explicitly weighting criteria, if appropriate. |
| IGP Grant Assessment Mechanism | <ul style="list-style-type: none"> • adopt a process of ranking applications according to compliance with criteria • use assessment/review panels to determine eligibility for the IGP before selection on merit is considered • issue guidelines/procedures for managing conflicts of interest on panels. |
| IGP Policy on Collaboration | <ul style="list-style-type: none"> • resolve the tension between the apparently conflicting aims of encouraging competition and collaboration between researchers • give an explicit weighting to collaboration as a criterion in its selection process. |
| IGP Industry Policy | <ul style="list-style-type: none"> • have a clearer policy statement and rationale for the kinds of industry links it wants to encourage • require successful applicants to adopt a Code to cover issues such as how projects are managed and how funds from public sources are spent • ensure the criteria of fostering collaboration with industry is consistent with other IGP criteria. |

IGP Protocols

- develop a policy and protocols on:
 - processes for clarifying information provided by applicants
 - how an applicant can discuss required changes to the standard Service Agreement
- provide a clear and simple application form
- provide feedback to unsuccessful applicants as to:
 - ◇ how a subsequent application can address shortcomings or would not meet criteria
 - ◇ what opportunity exists for appeal and Freedom of Information processes
- supply reasons for adverse decisions and/or introduce an appeals mechanism.

Accountability

- review the content and implementation of the Service Agreement to:
 - ◇ reduce the quantity of information required from successful applicants
 - ◇ include a requirement on information as to how grant money is spent
 - ◇ ensure that NSW Health meets its obligations.

IGP Evaluation

- has a formal evaluation process at the end of its first three years (1998-99) to determine whether the IGP has been a success. The process should be explicit as to how success is to be measured.

Appendix 3: Llewellyn-Smith Report on *Health and Medical R&D Infrastructure Needs*

The consultants' report recommended:

- quality project research based predominantly in higher education organisations be promoted
- functional groupings of researchers be supported
- new, high profile research institutes be supported
- a preferred method of funding on-going increased State infrastructure expenditure be considered by a taskforce
- infrastructure grants based on the quality of research measured by objective criteria be provided
- seeding funds to foster research strength in areas of need also be provided
- mechanisms to attract private sector funding of public sector research be considered
- researchers be encouraged to establish alliances with both Australian companies and transnational companies
- the commercialisation of research findings be facilitated through Government information and assistance programs.

Appendix 4: Additional Eligibility Criteria

Additional Criteria	Stream One	Stream Two	Stream Three
Independence	<p>Autonomous organisation must be established under an Act of Parliament or incorporated under appropriate legislation for companies or incorporated associations.</p> <p>Have an independent Board of Management.</p> <p>Independent responsibility for infrastructure and research staff.</p>		
Track Record of Funding from Competitive Sources	Over \$1m over 1994-96 from given set of funding agencies.	Annual average grants over \$350,000 from given set of funding agencies and/or employ more than 20 staff.	

Additional Criteria	Stream One	Stream Two	Stream Three
NH&MRC Accreditation	Must be accredited by NH&MRC as an independent research institute.		
Kind of Research			<p>Epidemiology</p> <p>public health (not lab based)</p> <p>social health research</p> <p>health services research</p> <p>health economics</p>

Appendix 5: Glossary of Terms

Applied Research-original work undertaken to acquire knowledge with a specific application in view. It is undertaken either to determine the possible uses for the findings of basic research or to determine new ways of achieving some specific and predetermined objectives.

Area Health Services (AHS)-These were introduced by NSW Health in October 1996 in Sydney, Newcastle and Wollongong. Each Area is responsible for the health of its local communities and management of all public hospitals and community health services within its boundaries, with some exceptions. Rural Health Service Areas were introduced in March 1996. For the purposes of this report, both AHS and RHS are referred to as AHS.

Australian Research Council (ARC)-provides advice to the Minister on the distribution of resources for the various programs for which it has responsibility. It also provides information and advice to the National Board of Employment, Education, Training and Youth Affairs on research policy issues.

ARC Research Infrastructure (Equipment and Facilities) Grants-encourages institutions to establish co-operative arrangements for the development of research infrastructure within the higher education system, and with outside organisations.

ARC Large Grants Program-provides funds to specific research projects on a competitive basis using peer review.

ARC Small Grants Program-provides funds to specific research projects on a competitive basis using peer review.

Basic Research-experimental and theoretical work undertaken without looking for long-term benefits other than the advancement of knowledge.

Block Grant-(NH&MRC)-fund independent institutes which are internationally recognised for their continuing contributions to health and medical R&D.

Clinical Research-applied research that involves patients in clinical settings, often used trials.

Commercialisation-the set of activities involved in producing and marketing an innovation.

Contestability-the extent to which the provision of a good or service is open to alternative suppliers.

Co-operative Research Centres-linkages between universities, CSIRO and other government research agencies, private firms, government businesses and other government agencies effected through participation in Centre R&D and training activities.

Infrastructure (IGP)-the facilities and functions of a research organisation which cannot be funded from project grants. Infrastructure thus includes physical facilities (ranging from buildings through some types of scientific equipment to telephones and fax machines) and the salaries of administrative and some senior scientific staff. It excludes funds, staff and materials deployed on specific projects.

National Health and Medical Research Council (NH&MRC)-is an independent statutory authority which provides advice to the Government on matters relating to health and the prevention, diagnosis and treatment of disease and on the funding for health and medical research.

Operating grants-are provided to universities as a single allocation of funds (or block grant) and have three components: a teaching, a research-related and a capital component.

Peer Review-merit is often determined using a competitive merit review process known as peer review. Peers (these may be individuals or panels) are charged with the responsibility of judging whether the research proposal submitted reflects excellence in terms of content and methodology

Program Grant (NH&MRC)-provide guaranteed support over five years to a group of high quality investigators working collaboratively on a number of projects in related fields.

Project Grant (NH&MRC)-is an award for the support of a scientific investigation by one or more staff of an institution and will usually not exceed three years. The purpose of the grant is to provide support for an investigation of mutual interest to the NH&MRC, the institution and investigator. The problems being investigated will normally be capable of solution in a reasonably short timeframe.

Public Health-refers to the health status of the population. Public health R&D is concerned with threats to this health status caused by infectious disease, injury, environmental exposure or by chronic but preventable disease.

Research and Development (R&D)-creative work undertaken on a systematic basis in order to increase the stock of knowledge-including knowledge of man, culture and society-and the use of this knowledge to devise new applications. (OECD definition)

Research Quantum-is the component of the operating grant notionally attributed to expenditure on research activities not directly associated with teaching and research activities

Resource Allocation Formula-a formula used by NSW Health to determine the levels of operating funds for Area Health Services in NSW. There is a teaching and research component of the RAF.

Strategic Basic Research-experimental and theoretical work undertaken to acquire knowledge directed toward specified broad areas in the expectation of useful discoveries. It provides the broad base of knowledge necessary for the practical solution of recognised problems.

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Performance Audit Reports

Agency or Issue Examined	Title of Performance Audit Report or Publication	Date Tabled in Parliament or Published
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Aboriginal Land Claims	<i>Aboriginal Land Claims</i>	31 August 1994
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Australia

Telephone (02) 9285 0155
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Internet <http://www.audit.nsw.gov.au>
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