

National Centre for Immunisation Research and Surveillance of Vaccine Preventable Diseases

Rationale for a national centre

In 1997, a competitive tender was let by the then Commonwealth Department of Health and Family Services, to establish a national centre consolidating expertise in the range of research and surveillance issues pertaining to immunisation programs. It was recognised that although a number of groups around Australia had conducted valuable studies in various aspects of vaccine preventable diseases, sometimes with the National Health and Medical Research Council or other external funding, much of the work needed to inform vaccination policy was not eligible for such funds.

Establishment of a core of expertise, along similar lines to that available through the Centres for Disease Control in the United States of America or the then Communicable Disease Surveillance Centre in the United Kingdom, was needed for a number of reasons. Firstly, it was recognised that immunisation had become one of the largest public health programs nationally, requiring additional resources in research and evaluation to underpin it, including behavioural and social research. Secondly, the newly established Australian Childhood Immunisation Register (ACIR) required epidemiological expertise and analysis capacity independent from the Health Insurance Commission which housed it. Thirdly, the development of policy options for new vaccines, which had started with the *Haemophilus influenzae* type b (Hib) vaccine in 1993, was likely to increase. Finally, the centre was to provide postgraduate training to develop more professionals skilled in research and evaluation related to immunisation programs.

Following success in the tender process by a team led by Professor Margaret Burgess, the National Centre for Immunisation Research and Surveillance of Vaccine Preventable Diseases (NCIRS) was established at the Children's Hospital at Westmead, Sydney, and as a Department of the University of Sydney, in August 1997. Matching funds and in-kind support were provided by the NSW Health Department.

Development of NCIRS and relationships with other groups since 2000

In 2000, an external review of NCIRS recommended increased support from the Commonwealth and the NSW Health Department to enable greater capacity in some key areas, guided by a strategic plan. These were increased support for the Australian Technical Advisory Group on Immunisation (ATAGI), including economic evaluation of vaccines, enhancing behavioural research and reporting of adverse events following immunisation (AEFI) in Australia and initiatives in immunisation for Aboriginal and Torres Strait Islander people. The strategic plan highlights these needs, with the aims of supporting policy and program development, in line with both national priorities and the international context. This expertise should be made available both through promoting development of networks with other groups throughout Australia and securing appropriately skilled personnel in NCIRS. Memoranda of understanding have been established with the University of Sydney, the Australian Institute of Health and Welfare, the NSW Health Department and the Cooperative Research Centre for Vaccine Technology, Brisbane. The current staff of NCIRS brings together a group of experts and postgraduate students in public health, preventive medicine, paediatrics, infectious disease, epidemiology, health economics, behavioural research and laboratory science. NCIRS contributes to immunisation and surveillance policy and planning through its representatives on, and reports for, a range of policy and planning groups, including the National Immunisation Committee, the Communicable Diseases Network Australia (CDNA) and the ATAGI.

Current research and surveillance activities

The areas of NCIRS' core business are listed below, with a separate working group managing each area. Further information about the personnel and activities relevant to each working group is available from the NCIRS website at: www.ncirs.usyd.edu.au/

Epidemiology and surveillance of vaccine-preventable diseases and adverse events after immunisation

Since 2000, NCIRS has produced a biennial supplement to *Communicable Diseases Intelligence*, titled *Vaccine Preventable Diseases and Vaccination Coverage in Australia*.^{1,2} This publication is a comprehensive report on the epidemiology of vaccine preventable diseases and vaccine coverage in Australia. NCIRS also provides input into enhanced surveillance for the National Notifiable Diseases Surveillance Scheme, and has collected enhanced surveillance data for Hib and pneumococcal disease.

Sero-epidemiology and laboratory research

NCIRS established a nationally representative serosurvey in 1998, initially as part of the evaluation of the National Measles Control Campaign. The first serosurvey was used to test population immunity to over 12 vaccine preventable diseases (VPDs) in Australia.³ A second serosurvey has been completed, and it is hoped these will become regular collections. The data from the serosurvey provide crucial information on immunity to vaccine preventable diseases in the population. This enables us to target vulnerable groups and assess the impact of vaccination campaigns. The data are also a key input into mathematical modelling of vaccine preventable diseases (see Health policy support and modelling).

The Australian Childhood Immunisation Register

NCIRS maintains the only historical data from the Australian Childhood Immunisation Register. These data are used to generate immunisation coverage maps to identify under-immunised sub-groups in the population. The data have also been used to look at Prevenar (PCV7) coverage in Indigenous children, to examine small area coverage methods, to study the timeliness of immunisation and the demographic characteristics of non-immunising parents. In 2001, NCIRS published a comprehensive evaluation of the validity of the ACIR data.⁴ This report also looked at the impact of parental incentives on immunisation, reasons for under-immunisation and coverage of the 2nd dose of the measles–mumps–rubella vaccine.

Behavioural and attitudinal research

NCIRS is involved in a range of behavioural and social research projects. These include looking at the attitudes and experiences of health care professionals about childhood immunisation, attitudes and behaviour of parents of children with developmental delay to childhood immunisations, parental experiences of adverse events following immunisation and evaluation of an adverse events clinic. Media coverage of anthrax vaccination and military personnel has also been analysed.

Health policy support and modelling

The Health Policy and Modelling group manages projects responding to or informing policy needs. The volume of new publications on immunisation-related topics is high and increasingly constantly. Health policy support activities are directed at producing evidence-based summaries of recent literature as a resource for ATAGI. These may later be published in *Communicable Diseases Intelligence* or other fora. Modelling activities include both economic and disease modelling. Economic analyses have included a cost-effectiveness study of universal infant vaccination with 7-valent pneumococcal conjugate vaccine, and subsequently, a comparison of meningococcal C vaccination with conjugate pneumococcal vaccination, which is ongoing. Economic analyses of varicella and inactivated polio vaccine have also been published. In collaboration with Mr Nigel Gay at the now Health Protection Agency in the United Kingdom, training and capacity in mathematical modelling of VPDs has been developed. Studies have so far looked at the impact of the Measles Control Campaign in Australia and predict future epidemics,^{5,6} and the potential impact of universal varicella vaccination.⁷

Immunisation issues and vaccine preventable diseases in Indigenous people

The range of activities looking at vaccine coverage, access and disease control in Aboriginal and Torres Strait Islander people has been expanded over the past three years. Projects include an evaluation of the National Indigenous Pneumococcal and Influenza Immunisation program and a report, to be published in *Communicable Diseases Intelligence* in 2004, comparing vaccine preventable diseases and vaccination coverage in Indigenous and non-Indigenous Australians.

Adverse events

NCIRS now liaises closely with the Adverse Drug Reaction Advisory Committee of the Therapeutic Goods Administration to produce periodic analyses of AEFI data, using population denominators such as the ACIR. An evaluation of national AEFI reporting mechanisms is also in progress. In addition, we have conducted a range of other related projects including: evaluating issues emerging from the Children's Hospital Adverse Events Clinic, examining the temporal relationship between sudden infant death syndrome and vaccination and evaluating adverse events following yellow fever vaccine.

Communication and postgraduate training

The volume of new information relevant to immunisation programs in Australia and the diversity of information needs for consumers and providers necessitates a range of communication approaches. These include teleconferences, media interviews and articles, reports and scientific publications, and presentations at national and international conferences. In 2002, a quarterly immunisation newsletter, sent to all interested providers in Australia, was initiated. At the end of 2003, an email list-server (Australian Immunisation Professionals) was established to facilitate rapid communication with and between personnel providing immunisation across the country. NCIRS also provides telephone advice on immunisation to health-care workers and interested lay people. Fact sheets on the following topics are available on our website:

- (a) thiomersal in vaccines;
- (b) diabetes and vaccines;
- (c) measles-mumps-rubella vaccine, inflammatory bowel disease and autism;
- (d) hepatitis B vaccine and multiple sclerosis;
- (e) anthrax vaccine;
- (f) vaccines, asthma and allergies.

NCIRS holds regular seminars and workshops on areas of immunisation of current national importance. Recent examples include meningococcal and pneumococcal disease and vaccines, vaccines against respiratory infections and human papilloma virus vaccine. These workshops have been valuable opportunities for national discussion and formulation of new policy options.

NCIRS has run a two day elective in the University of Sydney's Master of Public Health Program, entitled *Vaccines in Public Health* since 2000. In addition, staff contribute to teaching in the medical and Master of Public Health programs and supervise postgraduate and Honours students.

Governance and reporting

NCIRS has a Management Committee, chaired by the Director, and a Scientific Advisory Committee (SAC), chaired by an external expert. The management committee oversees internal administrative matters, while the SAC reviews the research program and advises on its methodology and priorities. In 2003, an Advisory Board was formed to provide guidance on the strategic development of NCIRS and implementation of the strategic plan. The Advisory Board reports to the Board of the Children's Hospital at Westmead. Regular reports are provided to the ATAGI, the National Immunisation Committee and the CDNA.

Future directions

NCIRS has an ongoing commitment to its current areas of activity, as well as the enhancement of existing and future networks, with the aim of ensuring maximum value from the wide variety of expertise present around Australia in immunisation and related programs. In particular, we are keen to enhance our communication strategies, capacity in mathematical modelling, work in Indigenous immunisation issues, and social research. A potential new area of interest is immunisation in an international health context, especially in the Western Pacific Region. Further questions would be welcome at the address listed below, or through our website.

Contacts

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