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Foreward

Patron, Professor Fiona Stanley

It is extremely gratifying to see the continued and, indeed, growing success of the APSU – both in terms of the important studies they facilitate and in achieving a secure funding base, including significant research and Enabling grants. For most of the studies undertaken through the APSU, there is no other single source of data that could answer the research questions and, clearly, this is recognised by the nation’s paediatricians, who regularly return their monthly report cards. This is a very effective and efficient method of surveillance and I congratulate the APSU team for persevering through some lean times to achieve their strong and valued place in improving the health of Australia’s children.

Chair, APSU Board, Professor Carol Bower

2005-2006 has seen some important changes in the APSU. Perhaps the most rewarding has been the success in achieving an Enabling grant from the National Health and Medical Research Council of Australia. This grant, in recognition of the national value of the APSU, provides funds to expand and improve the surveillance system. Strategic planning in relation to this grant has been undertaken, including plans to ensure ongoing infrastructure funding for the APSU to secure its future.

The research output of the APSU has increased considerably over 2005-2006, in part due to the additional funding from NHMRC and other sources. This is reflected not only in peer-reviewed publications and presentations, but influences on policy and practice as a result of the findings of APSU-based studies.

I am honoured to be associated with this valuable and vibrant surveillance system and thank most warmly the paediatricians throughout Australia who continue to support the APSU so enthusiastically. Long may it continue.
The APSU underwent a period of growth in 2005-6. Continued support from reporting clinicians and increased funding support from the NHMRC enabled us to expand our staff, broaden our activities and increase our productivity.

APSU has now facilitated over 40 research studies on rare childhood disorders. As indicated in this report we initiated two new studies in 2005: Neonatal Group B Streptococcus sepsis (led by Professor Lyn Gilbert) and Hyperinsulinaemic hypoglycaemia of infancy (led by Dr Ristan Greer). In 2006 studies of severe seat belt injury in children (led by Dr Yvonne Zurynski) and Simple Vitamin D deficiency rickets (led by Dr Craig Munns) were added. New studies for 2007 include Intussusception (led by Prof Julie Bines) and Acute Rheumatic Fever (led by Prof Jonathan Carapetis).

These studies are all topical and relevant to public health. For example, Vitamin D deficiency rickets is a significant problem for some of our immigrant communities and this study will inform planning of services and preventive and treatment programs. The study of severe seat belt injuries is topical because Australian seat belt policy is out of line with international laws and Australian road rules are currently under revision. The range of studies allows us to involve paediatricians with different interests and to spread the load of reporting among general paediatricians and sub-specialists. Dissemination of APSU data and its incorporation into policy and practice is a high priority and its impact continues to grow with increased scientific output and involvement of APSU staff on policy, clinical and education committees.

APSU also has a role in education. In 2005 we ran a highly successful workshop on fetal alcohol syndrome for over 100 health professionals, educators, researchers and policymakers. We were delighted to welcome Prof Ken Jones – who, in 1973 first described FAS in the English literature – as our keynote speaker. In collaboration with the Rett Syndrome Association, we also ran two well-attended and highly rated workshops on Rett syndrome, one for health professionals and one for carers.

We have also maintained strong links with overseas units and in 2006 met in London to celebrate the 20th anniversary of the British Paediatric Surveillance unit and to attend the 4th Scientific and Business meeting of the International Network of Paediatric Surveillance Units (INoPSU). Publication in Archives of Diseases in Childhood of a joint paper on the Public Health Impacts of INoPSU, led by Dr Daniel Greiner from the Canadian Unit, was a direct outcome from this productive meeting.

The strong collaboration between APSU and paediatricians throughout Australia is demonstrated by continuing high monthly reporting rates (93% In 2005 and 97% in 2006) and provision of high quality data on reported cases. On behalf of the APSU and all the study investigators I thank clinicians for their unflagging support of the unit. The evaluation proposed for 2007 will give contributors an opportunity to provide feedback – both positive and negative - to the APSU.

I also thank the APSU Investigators, staff, Board and Scientific Review Panel for their hard work and the President of the Paediatrics and Child Health Division of the RACP, Neil Wigg for his wonderful support. We are grateful also to the NHMRC, (Enabling Grant and Practitioner Fellowship programs), the Department of Health and Ageing, the University of Sydney and the Royal Australasian College of Physicians for their support of the APSU.
Patron

Fiona Stanley AC
Director, Telethon Institute for Child Health Research.
Professor, School of Paediatrics and Child Health,
The University of Western Australia.

Board

Carol Bower* (Chair)
Senior Principal Research Fellow, Division of Population
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Research.

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Epidemiology Unit South Western Sydney Area Health Service.

Peter McIntyre
Professor, Discipline of Paediatrics and Child Health, University
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and Surveillance of Vaccine Preventable Diseases (NCIRS), The
Children's Hospital at Westmead.

* Board and Scientific Review Panel members

Elisabeth Murphy
Clinical Consultant, Health Services Policy Branch, Policy
Division, NSW Department of Health.

Michael Nissen*
Director of Infectious Diseases & Clinical Microbiologist, Unit
Head of Queensland Paediatric Infectious Disease Laboratory.
Associate Professor in Biomolecular, Biomedical Science &
Health, Royal Children's Hospital, Brisbane.

Lesley Podesta
Assistant Secretary, Communicable Diseases Branch, Australian
Government Department of Health and Ageing – till August,
2005.

Susan Skull* (till mid 2005)
Head, Clinical Epidemiology and Biostatistics Unit, Royal
Children's Hospital, Melbourne, Victoria.

Barry Taylor
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Co-Director, New Zealand Paediatric Surveillance Unit.

Melissa Wake*
Director, Research and Public Health Unit, Centre for
Community Child Health, Royal Children's Hospital, Melbourne,
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Neil Wigg*
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Health Service, Brisbane. Associate Professor, Department of
Paediatrics and Child Health, University of Queensland.

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of New South Wales.

Yvonne Zurynski*
Deputy Director, Australian Paediatric Surveillance Unit.
Senior Lecturer (Research Only), Discipline of Paediatrics and
Child Health, The University of Sydney.

APSU Staff in 2005 - 2006

Professor Elizabeth Elliott, Director (January 1993 - )
Dr Yvonne Zurynski, Deputy Director (February 2006 - )
Ms Paula Cronin, Research and Publications Officer (October 2004-October 2006)
Dr Elizabeth Peadon, Medical Education Officer (January 2006 - )
Dr Katie Reeve, Research Officer (October 2006 - )
Ms Emily Fremantle, Research Assistant (December 2006 - )
Ms Nicole McKay, Data Manager (April 2006 - )
Ms Rosemary Robertson, Administration Officer (March 2005-May 2006)
Ms Karen Pattinson, Office Co-ordinator (August 2006 - )
Ms Ingrid Charters, Administration Officer (October 2004 - )
Institutions Collaborating with the APSU 1993-2006

National Organisations
- Australia and New Zealand Paediatric Nephrology Association
- Australian CHARGE Association
- Australian Enteric Pathogens Surveillance Scheme
- Australian Polio Expert Committee
- Australasian Paediatric Endocrine Group
- Australian Institute of Health and Welfare
- Australian Society of Clinical Immunology and Allergy
- Intergovernmental Committee on Drugs – Working party on FASD
- Commonwealth Department of Health and Ageing
- National Centre in HIV Epidemiology and Clinical Research
- National Centre for Immunisation Research and Surveillance of Vaccine Preventable Diseases
- National Heart Foundation of Australia
- National Notifiable Diseases Surveillance System
- National Perinatal Statistics Unit
- National Polio Reference Laboratory
- OzFoodNet: Australian Enhanced Foodborne Disease Surveillance
- Regional Certification Committee for Polio
- Rett Syndrome Association of Australia & AussieRett

New South Wales
- Bankstown Hospital
- CAMSHNET
- Centre for Kidney Research
- Centre for Mental Health, NSW Health
- Gastroenterology & Liver Unit, Prince of Wales Hospital
- Institute for Neuromuscular Research
- Hunter Genetics
- Liverpool Health Service
- Macleay Hastings Health Service
- Millennium Institute of Health Research
- NSW Birth Defects Register
- NSW Centre for Perinatal Health Services Research
- NSW Health
- Paediatric HIV Services Unit, Sydney Children’s Hospital
- Prince of Wales Medical Research Institute
- Royal Prince Alfred Hospital
- Royal North Shore Hospital
- Sydney Children’s Hospital
- The Children Hospital at Westmead
- University of NSW
- University of Sydney
- South Eastern Sydney & Illawarra Area Health Service
- South Eastern Area Laboratory Services
- Sydney South West Area Health Service

Victoria
- Australian Mycobacterium Reference Laboratory Network
- Centre for Adolescent Health
- Victorian Infectious Diseases Reference Laboratory
- Monash Medical Centre
- Murdoch Children’s Research Institute
- Public Health Group, Dept Human Services, Royal Womens Hospital, Melbourne
- Royal Children’s Hospital, Melbourne
- University of Melbourne

Queensland
- Mater Children’s Hospital
- Princess Alexandra Hospital
- Queensland University of Technology
- Royal Children’s Hospital, Herston, QLD
- Tropical Public Health Unit
- University of Queensland

South Australia
- Flinders Medical Centre
- Institute of Medical Veterinary Science
- Mycobacterium Reference Laboratory, Adelaide
- South Australian Health Commission
- Women’s and Children’s Hospital, Adelaide

Western Australian
- Curtin University
- Disability Services Commission
- King Edward Memorial Hospital, Perth
- Pathcentre, Queen Elizabeth II Medical Centre
- Princess Margaret Hospital for Children, Perth
- Royal Perth Hospital
- Telethon Institute for Child Health Research

Tasmania
- Royal Hobart Hospital

Northern Territory
- Alice Springs Hospital
- Royal Darwin Hospital
- The Menzies School of Public Health, Darwin

International Organisations
- British Paediatric Surveillance Unit
- Canadian Paediatric Surveillance Programme
- German Paediatric Surveillance Unit
- Greece & Cyprus Paediatric Surveillance Unit
- Latvian Paediatric Association
- Malaysian Paediatric Surveillance Unit
- Netherlands Paediatric Surveillance Unit
- New Zealand Paediatric Surveillance Unit
- Papua New Guinea Paediatric Surveillance Unit
- Portuguese Paediatric Surveillance Unit
- Swiss Paediatric Surveillance Unit
- Trinidad and Tobago Paediatric Surveillance Unit
- Republic of Ireland Paediatric Surveillance Unit
- Welsh Paediatric Surveillance Unit
Acknowledgements

Funding and Sponsorships 2005 – 2006

The National Health and Medical Research Council of Australia supports The APSU with an Enabling Grant entitled “Australian Paediatric Surveillance Unit: A collaborative network for child health research.” [Number 402784 (2006-2010)]


The Australian Government Department of Health and Ageing, provides infrastructure support for APSU studies that relate to communicable and vaccine-preventable diseases.

The Faculty of Medicine, University of Sydney supports the APSU financially. The APSU Director and Assistant Director are members of the Discipline of Paediatrics and Child Health, Faculty of Medicine.

Additional financial supporters for individual surveillance studies include:

- Congenital cytomegalovirus infection: Virology Division, Dept of Microbiology, South Eastern Area Laboratory Service, Sydney Children's Hospital
- HIV/AIDS and perinatal exposure to HIV: National Centre in HIV Epidemiology and Clinical Research
- Neonatal herpes simplex virus infection: Dept of Immunology and Infectious Diseases, The Children's Hospital at Westmead, Herpes Simplex Virus Research Unit
- Rett syndrome: The Telethon Institute for Child Health Research, USA National Institutes of Health, Rett Syndrome Association of Australia
- Vitamin K deficiency bleeding: NSW Health, Roche Products Pty. Ltd, Australia
- Vitamin D deficiency rickets: Roche Products Pty. Ltd, Australia

The APSU is a Unit of the Division of Paediatrics and Child Health of the RACP. The RACP provides support for APSU special projects including production of the annual report.

The Children’s Hospital at Westmead provides office space and research infrastructure support for the APSU.

Mount Majura Wines continues to generously sponsor the APSU wine draw prize.
The Australian Paediatric Surveillance Unit (APSU) is a national research resource, established in 1993 to facilitate active surveillance of uncommon childhood diseases, complications of common diseases or adverse effects of treatment, chosen for their public health importance and impact on health resources. To date, a range of infectious, vaccine-preventable, mental health, congenital and genetic conditions, and injuries have been studied (Table 1). For many childhood conditions, the APSU provides the only mechanism for national data collection.

To the end of 2006, The APSU was used by over 200 individual researchers to run 41 surveillance studies, and has been influential in the development of international units. Epidemiological and clinical data collected through the APSU are of direct relevance to clinical and public health policy and resource allocation, and thus impact on the health and welfare of Australian children (Table 1).

The APSU is a unit of the Division of Paediatrics and Child Health, Royal Australasian College of Physicians (RACP). It is based at The Children’s Hospital at Westmead. The APSU Board oversees the management and policy directions of the unit while the APSU Scientific Review Panel (SRP) determines which studies are suitable to run through the APSU mechanism and provides advice on surveillance methods. The activities of the APSU are funded in part by the Australian Government Department of Health and Ageing (Communicable Disease and Health Risk Policy Section), by the Faculty of Medicine, The University of Sydney, and by The National Health and Medical Research Council of Australia (NHMRC), and other competitive research funding.

Contributors to the APSU
Contributors to the APSU are clinicians working in paediatrics and child health in Australia. These are predominantly general paediatricians (56%) or paediatric sub-specialists. Neonatologists make up 6.4% of all contributors; surgeons 3.8%; geneticists 2.9% and neurologists 2.6%. Clinicians are identified through the Division of Paediatrics and Child Health of the RACP, the Australasian Association of Paediatric Surgeons and other paediatric special interest groups. In 2006 an estimated 91% of all paediatricians listed on the RACP list of Fellows and in active clinical practice in Australia participated in APSU surveillance.

Aims
1. To provide a national active surveillance mechanism that can be used to:
   - estimate the incidence, epidemiology, clinical features, current management and short-term outcomes of rare childhood conditions in Australia,
   - respond to epidemiological emergencies such as outbreaks, emerging or imported diseases.
2. To initiate and facilitate collaborative, national, child health research consistent with national health priorities, including ‘a healthy start in life’ and to fill knowledge gaps.
3. To produce and disseminate evidence that will support development of:
   - the most effective educational resources and clinical guidelines for clinicians,
   - the most appropriate prevention strategies and community awareness campaigns.

Operation of the APSU
Individuals or organisations may apply to study a condition through the APSU. Applications undergo a process of peer review by the SRP before being listed on the monthly report card. All studies must have the potential to contribute significant new knowledge about rare childhood conditions and to influence policy, clinical practice or resource allocation.

Conditions are usually studied for between one to three years, although provision for on-going surveillance may be granted for diseases of public health significance or with very low incidence (e.g. HIV/AIDS, congenital rubella).

Each month all clinicians participating in APSU surveillance are sent a report card listing up to 16 different conditions under surveillance and asked to return the report card whether they have seen a case or not. All positive reports of cases are then followed up by a brief questionnaire requesting de-identified information about the child’s demographics, details of diagnosis, management and short-term outcome. For more detail on APSU methodology please see the 2004 APSU Annual Report www.apsu.org.au.

Conditions Studied
Between 1993 and 2006, the APSU has facilitated 41 studies. The major findings and impacts of these studies are documented in Table 1.
### Table 1. Key findings of National Surveillance conducted through the APSU 1993-2006

<table>
<thead>
<tr>
<th>Conditions Under Surveillance</th>
<th>Dates of Study</th>
<th>Key findings, implications and publications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infectious/vaccine preventable conditions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute flaccid paralysis</td>
<td>Mar 1995-</td>
<td>APSU reports cases of acute flaccid paralysis (AFP) via DoHA Polio Expert Committee to WHO to maintain ‘polio-free’ certification for Australia. The primary causes of AFP are Guillain-Barre syndrome and transverse myelitis. Sixteen countries, including Indonesia, reported importations of wild poliovirus in 2005. Continued surveillance for AFP in Australia is essential to enable detection of imported poliovirus especially after the recent outbreak in Indonesia and entry of an adult infected with polio to Australia in 2007. (1)</td>
</tr>
<tr>
<td>Congenital cytomegalovirus (cCMV) infection</td>
<td>Jan 1999-</td>
<td>Provides the only national data collection for cCMV. CMV is the most common infectious cause of congenital malformation in Australia. cCMV is not associated with maternal illness in approximately 30% of cases and should be considered regardless of maternal history. cCMV remains under-diagnosed. Although most cases are diagnosed by urine culture, use of PCR for urinary screening for cCMV may increase diagnostic yield. Universal neonatal hearing screening programs may also help identify new cases.</td>
</tr>
<tr>
<td>Congenital varicella and Neonatal varicella</td>
<td>Mar 1995-Dec 1997</td>
<td>Identified that birth defects may occur with 3rd trimester infection; affected pregnancies should be monitored and infants’ eyes examined for visual impairment. (2, 3) Early identification, treatment of Neonatal varicella (acyclovir) recommended. (2)</td>
</tr>
<tr>
<td>Congenital varicella</td>
<td>May 2006-</td>
<td>Study reactivated after inclusion of Varicella vaccine on the National Immunisation Schedule in 2006. (4) One case of Congenital Varicella was reported from NSW in 2006.</td>
</tr>
<tr>
<td>Neonatal varicella</td>
<td>May 2006-</td>
<td>14 cases of Neonatal varicella were reported to end of 2006.</td>
</tr>
<tr>
<td>Severe Complications of Varicella</td>
<td>May 2006-</td>
<td>During the first seven months of surveillance, 14 children were hospitalised with complications of Varicella, including bacteraemia, osteomyelitis, cellulitis, pneumonia, hepatitis, encephalitis and ataxia. Only one child had been vaccinated against varicella.</td>
</tr>
<tr>
<td>Congenital rubella</td>
<td>May 1993-</td>
<td>Although the incidence of congenital rubella has declined, the risk remains particularly among immigrant women born in countries with poorly developed vaccination programs. Such women should have serological testing for rubella after arrival in Australia, and be vaccinated if appropriate. Travel to rubella endemic countries in the first trimester of pregnancy by women with no prior rubella immunity poses a risk to the fetus of congenital rubella. (5)</td>
</tr>
<tr>
<td>Haemolytic uraemic syndrome</td>
<td>Jul 1994-Dec 2001</td>
<td>The APSU study identified the types of Shiga-toxin producing E.coli prevalent in Australia; provided national data during the large HUS outbreak; and informed the code of production for fermented meats. (6, 7)</td>
</tr>
<tr>
<td>Hepatitis C virus infection</td>
<td>Jan 2003-</td>
<td>APSU is monitoring this emerging disease of national significance. It is anticipated that the results from this study will have impact on screening policy (8). Most (&gt;80%) HCV infection in Australian children is acquired perinatally. Infants at risk were born to mothers who used IV drugs (&lt;60%); had invasive procedures overseas; or had tattoos. Most HCV-infected children are clinically asymptomatic with mildly elevated liver function test at diagnosis.</td>
</tr>
<tr>
<td>HIV/AIDS, Perinatal exposure to HIV</td>
<td>May 1993-</td>
<td>APSU enhances mandatory reporting and identifies perinatal exposure and maternal risks. In 2005-06 all cases of HIV were due to perinatal transmission. The main source of infection in the mother was through heterosexual contact with a high risk partner. The transmission rate of infection has declined with increased use of interventions (including anti-retrovirals, elective caesarean delivery and avoidance of breastfeeding) in women diagnosed antenatally. (9)</td>
</tr>
<tr>
<td>Hospitalised pertussis in infancy</td>
<td>Jan 2001-Dec 2001</td>
<td>Identified adults as the main source of infection and informed revision of the immunisation schedule in 2003 to recommend vaccination of teenagers. Identified children less than 2 months of age to be at most risk and led to development of a trial of vaccination at birth. (10)</td>
</tr>
<tr>
<td>Invasive <em>Haemophilus Influenzae</em> infection</td>
<td>Jan 1998-Dec 2000</td>
<td>Confirmed success of (<em>Haemophilus influenzae</em>) Type B vaccination; influenced infection prevention policy. (11)</td>
</tr>
<tr>
<td>Kawasaki disease</td>
<td>May 1993-Jun 1995</td>
<td>Identified that young affected children may not fulfil international diagnostic criteria. (12)</td>
</tr>
<tr>
<td>Neonatal herpes simplex virus infection</td>
<td>Jan 1997-</td>
<td>HSV type 1 identified as the cause of neonatal infection in 50% of Australian cases. Typical skin or mucosal lesions are not evident in about half of the infants affected. Disseminated HSV infection may present with pneumonitis which requires early antiviral therapy and has poor outcome.</td>
</tr>
</tbody>
</table>
### Key findings of National Surveillance conducted through the APSU 1993-2006

#### Conditions Under Surveillance

<table>
<thead>
<tr>
<th>Condition</th>
<th>Dates of Study</th>
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<tr>
<td>Neonatal and Infant Group B Sepsis</td>
<td>Jan 2005-</td>
<td>Documents the incidence, morbidity and mortality of GBS while identifying genotype distribution. Preliminary results show that over half of reported cases have been ‘early onset,’ at less than 8 days of age. (28)</td>
</tr>
<tr>
<td>Non Tuberculous Mycobacterial Infection (NTMI)</td>
<td>July 2004-</td>
<td>Usually presents with lymphadenopathy in healthy children aged &lt; 5 yrs. <em>Mycobacterium avium intracellulare</em> and <em>mycobacterium fortuitum</em> most commonly isolated. Surgery is the most common therapy. Relapse occurs in about 20% of cases regardless of the medical therapy used. (13)</td>
</tr>
<tr>
<td>Subacute Seatbelt Injuries</td>
<td>Jan 1995-Dec 1998</td>
<td>Very rare, reflecting high uptake of measles vaccination. (14)</td>
</tr>
<tr>
<td>Simple Vitamin D Deficiency</td>
<td>Jan 2001-Dec 2003</td>
<td>Sentinel adverse effects documented in infants and children range from mild to fatal. Dietary restrictions; use of CAM in pregnancy; and use of CAM in place of conventional medications pose significant risks.</td>
</tr>
<tr>
<td>Adverse reactions to complementary and alternative medicines</td>
<td>Jan 2001-Dec 2003</td>
<td>Documented risk factors, informed revision of new disease classification and informed causal pathways. (14)</td>
</tr>
<tr>
<td>Anaphylaxis following food ingestion</td>
<td>Jul 2004-</td>
<td>Highlighted Vitamin D Deficiency Rickets as a common problem among immigrant and refugee children.</td>
</tr>
<tr>
<td>Fetal Alcohol Syndrome</td>
<td>Jan 2001-Dec 2004</td>
<td>Indigenous children over-represented; children often in foster care and have affected siblings. Informed causal pathways and educational strategies. (18)</td>
</tr>
<tr>
<td>Haemoglobinopathies</td>
<td>July 2004-Mar 2006</td>
<td>Documented numbers affected, need for immunotherapy and bone marrow transplant. (21)</td>
</tr>
<tr>
<td>Prader-Willi syndrome</td>
<td>Jan 1998-Dec 2000</td>
<td>First DNA-confirmed estimate of birth prevalence. PWS often missed clinically in infants - education needed. (20)</td>
</tr>
<tr>
<td>Primary immunodeficiency disorders (PID)</td>
<td>Jan 1997-Dec 1999</td>
<td>Informed causal pathways and educational strategies. (18)</td>
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<td>Renal Hypertension</td>
<td>Jan 2000-Dec 2003</td>
<td>First study to document the burden of this illness in Australian children and to clarify psychosocial risk factors. (25)</td>
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<td>Rett syndrome</td>
<td>May 1993-Apr 1995, Jan 2000-ongoing</td>
<td>Confirmed good outcome following bone marrow transplant. (23)</td>
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<td>Childhood dementia</td>
<td>May 1993-Jun 1995</td>
<td>First national study worldwide. Clarified diagnostic criteria and identified large group with no identified cause. (24)</td>
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<tr>
<td>Childhood conversion disorder</td>
<td>Jan 2002-Dec 2003</td>
<td>First study to document the burden of this illness in Australian children and to clarify psychosocial risk factors. (25)</td>
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<td>Munchausen by proxy syndrome</td>
<td>Jan 2000-Dec 2003</td>
<td>First study to document impact of the diagnosis on clinicians; data informed development of management policy. (18)</td>
</tr>
<tr>
<td>Early onset eating disorder</td>
<td>Jul 2002-Jul 2005</td>
<td>First national study of children &lt;13 yrs. Contributing to debate on relevance of adult diagnostic (DSM) criteria to children. Simultaneous Canadian and British study will allow for international comparison. (18)</td>
</tr>
</tbody>
</table>

#### Mental health issues

- **Hirschsprung disease**: Jan 1997-Dec 2000 - Primary surgical procedure most used is Soave operation. (19)
- **Prader-Willi syndrome**: Jan 1998-Dec 2000 - First DNA-confirmed estimate of birth prevalence. PWS often missed clinically in infants - education needed. (20)
- **Primary immunodeficiency disorders (PID)**: Jan 1997-Dec 1999 - Documented numbers affected, need for immunotherapy and bone marrow transplant. (21)
- **Haemoglobinopathies**: July 2004-Mar 2006 - Documented numbers affected, need for immunotherapy and bone marrow transplant. (21)
- **Severe combined immunodeficiency**: May 1995-Dec 2001 - Confirmed good outcome following bone marrow transplant. (23)

#### Surveillance Overview

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</tr>
<tr>
<td>Adverse reactions to complementary and alternative medicines</td>
<td>Jan 2001-Dec 2003</td>
<td>Documented risk factors, informed revision of new disease classification and informed causal pathways. (14)</td>
</tr>
<tr>
<td>Anaphylaxis following food ingestion</td>
<td>Jul 2004-</td>
<td>Highlighted Vitamin D Deficiency Rickets as a common problem among immigrant and refugee children.</td>
</tr>
<tr>
<td>Fetal Alcohol Syndrome</td>
<td>Jan 2001-Dec 2004</td>
<td>Indigenous children over-represented; children often in foster care and have affected siblings. Informed causal pathways and educational strategies. (18)</td>
</tr>
<tr>
<td>Haemoglobinopathies</td>
<td>July 2004-Mar 2006</td>
<td>Documented numbers affected, need for immunotherapy and bone marrow transplant. (21)</td>
</tr>
<tr>
<td>Prader-Willi syndrome</td>
<td>Jan 1998-Dec 2000</td>
<td>First DNA-confirmed estimate of birth prevalence. PWS often missed clinically in infants - education needed. (20)</td>
</tr>
<tr>
<td>Primary immunodeficiency disorders (PID)</td>
<td>Jan 1997-Dec 1999</td>
<td>Informed causal pathways and educational strategies. (18)</td>
</tr>
<tr>
<td>Renal Hypertension</td>
<td>Jan 2000-Dec 2003</td>
<td>First study to document impact of the diagnosis on clinicians; data informed development of management policy. (18)</td>
</tr>
<tr>
<td>Childhood dementia</td>
<td>May 1993-Jun 1995</td>
<td>First national study worldwide. Clarified diagnostic criteria and identified large group with no identified cause. (24)</td>
</tr>
<tr>
<td>Childhood conversion disorder</td>
<td>Jan 2002-Dec 2003</td>
<td>First study to document the burden of this illness in Australian children and to clarify psychosocial risk factors. (25)</td>
</tr>
<tr>
<td>Munchausen by proxy syndrome</td>
<td>Jan 2000-Dec 2003</td>
<td>First study to document impact of the diagnosis on clinicians; data informed development of management policy. (18)</td>
</tr>
<tr>
<td>Early onset eating disorder</td>
<td>Jul 2002-Jul 2005</td>
<td>First national study of children &lt;13 yrs. Contributing to debate on relevance of adult diagnostic (DSM) criteria to children. Simultaneous Canadian and British study will allow for international comparison. (18)</td>
</tr>
</tbody>
</table>
References


Response Rates
In 2005, 1148 clinicians participated in the monthly surveillance of 13 conditions, with an overall response rate of 93% (Figure 1). In 2006, 1247 clinicians participated in the monthly surveillance of 16 conditions and the overall response rate was 97% (Figure 1). This maintains the excellent participation level by contributing clinicians since APSU’s inception in 1993. In 2005, 57% of clinicians reported by e-mail and this increased to 63% in 2006.

Figure 1. APSU annual response rate (%) 1993-2006.

New South Wales (NSW) has the greatest proportion of the national population of children aged under 15yrs (33.2%), Victoria has 24.1% and Queensland 20.3%. Correspondingly, NSW has the greatest number of participating clinicians. Response rates to the monthly report card have remained high among all states, with ACT and Tasmania recording the highest rates in 2005-2006 (Table 2).

Table 2. Response rates to monthly report card, number of clinicians reporting to the APSU and proportion of all children < 15yrs of age for each state for 2005 & 2006.

<table>
<thead>
<tr>
<th>STATE</th>
<th>RESPONSE RATE (%)</th>
<th>CLINICIANS REPORTING N (%)</th>
<th>PROPORTION OF AUSTRALIAN CHILDREN &lt; 15yrs N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT</td>
<td>95</td>
<td>99</td>
<td>19 (1.7)</td>
</tr>
<tr>
<td>NSW</td>
<td>93</td>
<td>97</td>
<td>460 (40.0)</td>
</tr>
<tr>
<td>NT</td>
<td>81</td>
<td>95</td>
<td>9 (0.8)</td>
</tr>
<tr>
<td>QLD</td>
<td>94</td>
<td>98</td>
<td>186 (16.2)</td>
</tr>
<tr>
<td>SA</td>
<td>93</td>
<td>96</td>
<td>88 (7.7)</td>
</tr>
<tr>
<td>TAS</td>
<td>94</td>
<td>100</td>
<td>19 (1.7)</td>
</tr>
<tr>
<td>VIC</td>
<td>93</td>
<td>95</td>
<td>266 (23.2)</td>
</tr>
<tr>
<td>WA</td>
<td>94</td>
<td>94</td>
<td>101 (8.7)</td>
</tr>
<tr>
<td>Australia Total</td>
<td>93</td>
<td>97</td>
<td>1148 (100)</td>
</tr>
</tbody>
</table>

Respondent workload
Workload in completing questionnaires is low. During 2005 the majority of clinicians (81%) had no cases to report; 12.9% reported one case, 4% reported two and 2% reported three or more cases. During 2006, 76% clinicians had no cases to report; 15.3% reported one case, 6% reported two and 4% reported three or more cases.
Summary of surveillance study results 2005-2006

A summary of the classification of all reports received for the period 2005-2006 is presented in Table 3. Duplicate reports are identified according to the child’s date of birth, first two letters of the first name and first two letters of the surname. After duplicates are identified, all data are completely deidentified. Errors include cases that do not meet case definition criteria or administrative errors including “report made by mistake”.

Table 3. Summary of results for studies conducted during 2005-2006

<table>
<thead>
<tr>
<th>Conditions Under Surveillance</th>
<th>Year</th>
<th>Total notifications</th>
<th>Questionnaires returned, n (%)</th>
<th>Duplicate cases</th>
<th>Errors</th>
<th>Probable/unknown cases</th>
<th>Total confirmed cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute flaccid paralysis (AFP) *</td>
<td>2005</td>
<td>60</td>
<td>60 (100)</td>
<td>12</td>
<td>17</td>
<td>-</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>71</td>
<td>71 (100)</td>
<td>15</td>
<td>13</td>
<td>-</td>
<td>43</td>
</tr>
<tr>
<td>Congenital cytomegalovirus (cCMV) infection *</td>
<td>2005</td>
<td>21</td>
<td>18 (86)</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>29</td>
<td>25 (86)</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>Congenital rubella (with defects)</td>
<td>2005</td>
<td>NIL</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>NIL</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Hepatitis C virus infection (HCV)</td>
<td>2005</td>
<td>17</td>
<td>14 (82)</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>13</td>
<td>12 (92)</td>
<td>2</td>
<td>-</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Perinatal exposure to HIV including 1 case of HIV acquired by other means *</td>
<td>2005</td>
<td>33</td>
<td>31 (91)</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>42</td>
<td>30 (71)</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>25</td>
</tr>
<tr>
<td>Neonatal herpes simplex virus Infection (HSV)</td>
<td>2005</td>
<td>20</td>
<td>19 (95)</td>
<td>10</td>
<td>-</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>22</td>
<td>20 (91)</td>
<td>9</td>
<td>-</td>
<td>-</td>
<td>11</td>
</tr>
<tr>
<td>Non tuberculous mycobacterial Infection (NTMI) *</td>
<td>2005</td>
<td>49</td>
<td>41 (84)</td>
<td>5</td>
<td>5</td>
<td>18</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>62</td>
<td>44 (71)</td>
<td>7</td>
<td>4</td>
<td>16</td>
<td>17</td>
</tr>
<tr>
<td>Neonatal Group B Streptococcus Sepsis (GBS) *</td>
<td>2005</td>
<td>64</td>
<td>57 (89)</td>
<td>9</td>
<td>7</td>
<td>4</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>100</td>
<td>84 (84)</td>
<td>13</td>
<td>13</td>
<td>3</td>
<td>55</td>
</tr>
<tr>
<td>Rett syndrome *</td>
<td>2005</td>
<td>26</td>
<td>25 (96)</td>
<td>9</td>
<td>-</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>24</td>
<td>24 (100)</td>
<td>7</td>
<td>2</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Haemoglobinopathies</td>
<td>2005</td>
<td>43</td>
<td>35 (81)</td>
<td>3</td>
<td>4</td>
<td>-</td>
<td>28</td>
</tr>
<tr>
<td>Early onset eating disorder</td>
<td>2005</td>
<td>30</td>
<td>25 (83)</td>
<td>1</td>
<td>4</td>
<td>-</td>
<td>20</td>
</tr>
<tr>
<td>Hyperinsulinaemic hypoglycaemia</td>
<td>2005</td>
<td>62</td>
<td>39 (63)</td>
<td>6</td>
<td>10</td>
<td>2</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>48</td>
<td>39 (81)</td>
<td>12</td>
<td>5</td>
<td>-</td>
<td>22</td>
</tr>
<tr>
<td>Vitamin K deficiency bleeding</td>
<td>2005</td>
<td>3</td>
<td>2 (67)</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>9</td>
<td>7 (78)</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Neonatal varicella</td>
<td>2006</td>
<td>11</td>
<td>10 (91)</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>Congenital varicella</td>
<td>2006</td>
<td>3</td>
<td>3 (100)</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Severe complications of varicella infection</td>
<td>2006</td>
<td>22</td>
<td>16 (73)</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>13</td>
</tr>
<tr>
<td>Simple vitamin D deficiency Rickets</td>
<td>2006</td>
<td>655</td>
<td>619 (95)</td>
<td>138</td>
<td>224</td>
<td>1</td>
<td>256</td>
</tr>
<tr>
<td>Serious seatbelt injuries</td>
<td>2006</td>
<td>52</td>
<td>47 (90)</td>
<td>6</td>
<td>11</td>
<td>-</td>
<td>30</td>
</tr>
</tbody>
</table>

* Include notifications from APSU and other sources (e.g. laboratory).

Table 4a & 4b shows the reported rate of disease for conditions studied through the APSU during 2005-2006. For conditions where cases were ascertained through additional complementary sources e.g. mandatory reporting systems and laboratory surveillance, (including perinatal exposure to HIV, acute flaccid paralysis and Rett syndrome) cases from more than one source have been included to estimate the rate of disease.

References:

Incidence is estimated as the reported number of newly diagnosed cases of disease in a defined population and seen by paediatricians in a defined period of time. As 100% case ascertainment is unlikely to be achieved by any one surveillance scheme, ‘reported rate of disease’ is used in this report to represent estimates of minimum incidence. Reported rate of disease is expressed either as the number of new cases per 100,000 live births per annum (for conditions diagnosed before 12 months of age), or per 100,000 children aged under 15 years per annum (Table 4a and 4b). Population figures for the denominator are obtained from the Australian Bureau of Statistics. (1)
Table 4a. Reported rate for each condition studied to December 2005

<table>
<thead>
<tr>
<th>Conditions Under Surveillance</th>
<th>Commencement date</th>
<th>Duration of study (years)</th>
<th>Total notifications</th>
<th>Questionnaires returned, n (%)</th>
<th>Total confirmed cases for duration of study*</th>
<th>Reported Rate for duration of study (per 10^5 per annum)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infectious/vaccine preventable conditions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute flaccid paralysis</td>
<td>Mar 1995</td>
<td>10.75</td>
<td>594</td>
<td>530 (89%)</td>
<td>388</td>
<td>0.9^b</td>
</tr>
<tr>
<td>Congenital cytomegalovirus (cCMV) infection</td>
<td>Jan 1999</td>
<td>7</td>
<td>226</td>
<td>154 (68%)</td>
<td>57</td>
<td>3.2^a</td>
</tr>
<tr>
<td>Congenital rubella (with defects)</td>
<td>May 1993</td>
<td>12.5</td>
<td>106</td>
<td>102 (96%)</td>
<td>50</td>
<td>0.1^b</td>
</tr>
<tr>
<td>Hepatitis C virus infection</td>
<td>Jan 2003</td>
<td>3</td>
<td>74</td>
<td>62 (84%)</td>
<td>32</td>
<td>0.3^b</td>
</tr>
<tr>
<td>Perinatal exposure to HIV</td>
<td>May 1993</td>
<td>12.5</td>
<td>432</td>
<td>396 (92%)</td>
<td>258</td>
<td>7.8^a</td>
</tr>
<tr>
<td>HIV infection (Perinatal and other)**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neonatal herpes simplex virus infection</td>
<td>Jan 1997</td>
<td>9</td>
<td>163</td>
<td>156 (97%)</td>
<td>77</td>
<td>3.4^a</td>
</tr>
<tr>
<td>Non Tuberculosis Mycobacterial Infection (NTMI)</td>
<td>Jul 2004</td>
<td>1.5</td>
<td>104</td>
<td>88 (85%)</td>
<td>21</td>
<td>0.3^b</td>
</tr>
<tr>
<td>Neonatal Group B Streptococcus sepsis</td>
<td>Jul 2005</td>
<td>0.5</td>
<td>64</td>
<td>57 (89%)</td>
<td>37</td>
<td>†</td>
</tr>
<tr>
<td><strong>Congenital/genetic disorders</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rett syndrome</td>
<td>Jan 2000</td>
<td>5</td>
<td>189</td>
<td>184 (97%)</td>
<td>98</td>
<td>0.4^b</td>
</tr>
<tr>
<td>Haemoglobinopathies</td>
<td>Jul 2004</td>
<td>1.5</td>
<td>88</td>
<td>70 (80%)</td>
<td>52</td>
<td>0.7^b</td>
</tr>
<tr>
<td><strong>Mental health</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early onset eating disorder</td>
<td>Jul 2002 to Jul 2005</td>
<td>3</td>
<td>183</td>
<td>163 (89%)</td>
<td>101</td>
<td>1.4^c</td>
</tr>
<tr>
<td><strong>Other injury/illness</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hyperinsulinaemic Hypoglycaemia</td>
<td>Jan 2005</td>
<td>1</td>
<td>62</td>
<td>39 (63%)</td>
<td>21</td>
<td>8.0^a</td>
</tr>
<tr>
<td>Vitamin K deficiency bleeding</td>
<td>May 1993</td>
<td>12.5</td>
<td>116</td>
<td>115 (99%)</td>
<td>23</td>
<td>0.7^a</td>
</tr>
</tbody>
</table>

* Total confirmed cases indicate the number of “confirmed cases” as defined by study protocol.

a. Reported incidence per 100,000 live births
b. Reported incidence per 100,000 children <15 years
c. Reported incidence per 100,000 children 5-13 years

** HIV infection includes cases due to perinatal exposure and from other sources.

† Due to the limited surveillance period a reported rate cannot be calculated
Table 4b. Reported rate for each condition studied to December 2006

<table>
<thead>
<tr>
<th>Conditions Under Surveillance</th>
<th>Commencement date</th>
<th>Duration of study (years)</th>
<th>Total notifications</th>
<th>Questionnaires returned, n (%)</th>
<th>Total confirmed cases for duration of study*</th>
<th>Reported Rate for duration of study (per 10^5 per annum)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infectious/vaccine preventable conditions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute flaccid paralysis</td>
<td>Mar 1995</td>
<td>11.75</td>
<td>672</td>
<td>601 (89%)</td>
<td>412</td>
<td>0.9^b</td>
</tr>
<tr>
<td>Congenital cytomegalovirus (cCMV) infection</td>
<td>Jan 1999</td>
<td>8</td>
<td>255</td>
<td>177 (69%)</td>
<td>75</td>
<td>3.7^a</td>
</tr>
<tr>
<td>Congenital rubella (with defects)</td>
<td>May 1993</td>
<td>13.5</td>
<td>106</td>
<td>102 (96%)</td>
<td>50</td>
<td>0.1^b</td>
</tr>
<tr>
<td>Hepatitis C virus infection</td>
<td>Jan 2003</td>
<td>4</td>
<td>87</td>
<td>74 (85%)</td>
<td>41</td>
<td>0.3^a</td>
</tr>
<tr>
<td>Perinatal exposure to HIV including HIV infection (Perinatal and other)**</td>
<td>May 1993</td>
<td>13.5</td>
<td>474</td>
<td>426 (90%)</td>
<td>283</td>
<td>8.0^a</td>
</tr>
<tr>
<td>Neonatal herpes simplex virus infection</td>
<td>Jan 1997</td>
<td>10</td>
<td>185</td>
<td>176 (95%)</td>
<td>88</td>
<td>3.5^a</td>
</tr>
<tr>
<td>Non Tuberculosis Mycobacterial Infection (NTMI)</td>
<td>Jul 2004</td>
<td>2.5</td>
<td>168</td>
<td>134 (80%)</td>
<td>38</td>
<td>0.3^b</td>
</tr>
<tr>
<td>Neonatal Group B Streptococcus sepsis</td>
<td>Jul 2005</td>
<td>1.5</td>
<td>164</td>
<td>141 (86%)</td>
<td>92</td>
<td>23.2^a</td>
</tr>
<tr>
<td>Neonatal Varicella</td>
<td>May 2006</td>
<td>0.7</td>
<td>11</td>
<td>10 (90%)</td>
<td>8</td>
<td>†</td>
</tr>
<tr>
<td>Congenital Varicella</td>
<td>May 2006</td>
<td>0.7</td>
<td>3</td>
<td>3 (100%)</td>
<td>1</td>
<td>†</td>
</tr>
<tr>
<td>Severe complications of Varicella infection</td>
<td>May 2006</td>
<td>0.7</td>
<td>22</td>
<td>16 (73%)</td>
<td>13</td>
<td>†</td>
</tr>
<tr>
<td><strong>Congenital/genetic disorders</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rett syndrome</td>
<td>Jan 2000</td>
<td>6</td>
<td>213</td>
<td>208 (98%)</td>
<td>106</td>
<td>0.4^b</td>
</tr>
<tr>
<td><strong>Other injury/illness</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hyperinsulinaemic Hypoglycaemia</td>
<td>Jan 2005</td>
<td>2</td>
<td>108</td>
<td>61 (57%)</td>
<td>43</td>
<td>8.2^a</td>
</tr>
<tr>
<td>Vitamin K deficiency bleeding</td>
<td>May 1993</td>
<td>13.5</td>
<td>125</td>
<td>122 (98%)</td>
<td>25</td>
<td>0.7^b</td>
</tr>
<tr>
<td>Simple Vitamin D Deficiency Rickets</td>
<td>Jan 2006</td>
<td>0.8</td>
<td>654</td>
<td>619 (95%)</td>
<td>256</td>
<td>6.3^a</td>
</tr>
<tr>
<td>Serious Seatbelt Injuries</td>
<td>Jan 2006</td>
<td>0.8</td>
<td>52</td>
<td>47 (90%)</td>
<td>30</td>
<td>0.7^c</td>
</tr>
</tbody>
</table>

* Total confirmed cases indicate the number of “confirmed cases” as defined by study protocol.

a. Reported incidence per 100,000 live births
b. Reported incidence per 100,000 children <15 years
c. Reported incidence per 100,000 children ≤12 years

** HIV infection includes cases due to perinatal exposure and from other sources.

† Due to the limited surveillance period a reported rate cannot be calculated
Surveillance Study Reports

Acute Flaccid Paralysis (AFP)
BR Thorley, HE Kelly, KA Brussen, M Ryan, J Antony, E Elliott

Background: For objectives and case definitions please see www.apsu.org.au

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Results: During 2005-2006 there were 131 notifications of AFP, with 74 classified as non-polio AFP by the Polio Expert Committee (PEC); 31 cases in 2005 and 43 in 2006 (Figure 2). The annual incidence rate for non-polio AFP was 0.78 in 2005 and 1.08 in 2006 reaching the WHO recommended target of 1 in 100,000. There was variation between the states and territories reporting AFP cases, with NSW, QLD and TAS reaching the recommended WHO target in 2005, while NSW, QLD and VIC reached the WHO target in 2006. WHO defines adequate faecal collection as two specimens collected 24 hours apart within 14 days of onset of paralysis. Adequate faecal collection was achieved in 23% of AFP cases notified in 2005, and 21% of cases in 2006, which is below the WHO recommended target of 80%. Guillain-Barre Syndrome continued to be the most common diagnosis (35%), followed by transverse myelitis (12%). Between 2000 and 2006, 11 cases of AFP were attributed to infant botulism. Incidental polioviruses were isolated from six of these cases, including one case in 2005. An incidental poliovirus was also isolated from a case of transverse myelitis in 2005. All polioviruses tested at the Australian National Polio Reference Laboratory were identified as oral polio vaccine-like.

For case classification details and reported rates please see Tables 3 & 4, page 12-14

Study Highlights and Impacts:
• Australia exceeded the WHO performance indicator for AFP surveillance in 2006.
• Oral polio vaccine (OPV) was replaced with inactivated polio vaccine in the National Immunisation Program from November 2005, and continued surveillance is important for the monitoring of the vaccine program effectiveness.
• Any poliovirus isolated from clinical specimens from mid-2006 would be regarded as an importation and requires full clinical and laboratory investigation.
• It is imperative for Australia to maintain a sensitive AFP surveillance system to enable detection of imported poliomyelitis and to maintain Australia’s polio free status.

Figure 2. Comparison of Australia’s AFP surveillance data with the WHO performance indicator, 1995-2006.

Original Articles
Thorley BR, Brussen KA, Elliott EJ, Kelly HA. Vigilance is required for Australia to remain polio free. Medical Journal of Australia 2006; 184(9): 474-5.

Presentations
Thorley BR. The many faces of polio: endemic, imported, VAPP and VDPV. Australian Virology Group, December 2005.
Thorley B, Brussen KA and Kelly H. How do we know we are polio free? 10th National Immunisation / 2nd PHAA Asia Pacific Vaccine Preventable Diseases Conference, 2006.
**Congenital Cytomegalovirus Infection (cCMV)**

**W Rawlinson, G Scott, P Palasanthiran, M Ferson, D Smith, G Higgins, M Catton, A McGregor, D Dwyer, A Kesson**

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**Background:** For objectives and case definitions please see [www.apsu.org.au](http://www.apsu.org.au)

**Results:** In 2005-2006 there were 50 notifications of cCMV and the questionnaire return rate was 86% (n=43). There were 27 confirmed cases, seven probable cases, four errors and five duplicate reports. Most mothers whose children were diagnosed with cCMV were multigravidas, reinforcing the fact that it is women with toddlers and older children who are most at risk of acquiring CMV infection in pregnancy and transmitting the infection to the unborn child. Congenital CMV was not associated with maternal illness in approximately one third of cases and is likely to be under-diagnosed in Australia. Hepatic, splenic and haematological signs and symptoms are the main presenting features of cCMV in the neonatal period as reported previously (Munro et al 2005). Universal neonatal screening programs may help to identify cases and the use of PCR for urinary screening may increase diagnostic yield.

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**For case classification details and reported rates please see Tables 3 & 4, page 12-14**

**Study Highlights and Impacts:**

- CMV continues to be the most common infectious cause of congenital malformations.
- It contributes to intrauterine and neonatal death (termination of pregnancy, stillbirth and miscarriage) and future investigations are being directed to the perinatal period.
- In this study data collection has concentrated on infants diagnosed at birth or in the first week of life and there is a lack of follow-up and outcome data.
- Since 2005 we commenced more detailed studies of the outcomes of cCMV infection, in close collaboration with paediatricians at the two major children’s hospitals in NSW.
- We have demonstrated the cell lines infected with CMV in healthy and clinically affected children and working on the mechanisms of transplacental transmission of CMV (Trincado et al 2005).
- We have commenced preliminary perinatal viral studies in collaboration with obstetricians in NSW.

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**Original Articles:**


**Abstracts:**


**Presentations:**

Congenital Rubella
C Jones, J Forrest

Background: For objectives and case definitions please see www.apsu.org.au

Results: Since surveillance began in 1993 there have been 50 confirmed cases of congenital rubella in Australia with reports decreasing significantly in recent years. There was only one confirmed case in 2004 and no cases were identified during 2005-2006. The case confirmed in 2004 was of a child born to an immigrant woman who had not been vaccinated against rubella.

For case classification details and reported rates please see Tables 3 & 4, page 12-14

Study Highlights and Impacts:
• Immigrant women born in countries with poorly developed vaccination programs should have serological testing for rubella after arrival in Australia and vaccination where appropriate.
• Travel to rubella endemic countries in the first trimester of pregnancy by women with no prior rubella immunity poses a risk of congenital rubella to the fetus.
• Continued vigilance for this rare congenital infection is essential given the seriousness of congenital rubella syndrome which is characterised by deafness, cataracts, growth retardation, mental handicap and cardiac abnormalities.

Original articles: None
Abstracts: None
Group B Streptococcal (GBS) Sepsis
L Gilbert, S Garland, H Gidding, D Isaacs, A Daley, D Burgner, A Keil, J Faoagali, C Cooper

Background: For objectives and case definitions please see www.apsu.org.au

Results: Of the 92 confirmed cases between July 2005 and December 2006, 52 (57%) have been classified as early onset GBS sepsis – the target of intrapartum antibiotic prophylaxis. This translates to a rate of 24/100,000 births in 2005 and 10/100,000 births in 2006. Reported rates were consistent across states, except for Queensland, whose rate was double the national average. For the 38 cases of late-onset sepsis, the rate was 7.3/100,000 births for 2005 and 2006.

Preliminary analysis of clinical data shows that, septicaemia is common to both early and late-onset cases. Pneumonia is the most frequently observed complication in early-onset cases, and meningitis is significantly associated with late-onset cases. This is consistent with previously published surveys of neonatal sepsis in major hospitals.

Part of our study involves retrieval from diagnostic laboratories of the group B streptococcus isolates from reported cases. Of the 92 confirmed cases, 69 (75%) isolates have been obtained, mostly from blood cultures, and are currently stored in our lab. To date genotypic investigation has been completed on more than half of the isolates obtained.

For case classification details and reported rates please see Tables 3 & 4, page 12-14

Study Highlights and Impacts:
- This study has the potential to inform development of safer, more efficient ways to prevent GBS through better understanding of bacterial virulence and host susceptibility and better data on genotype distribution and antibiotic resistance.
- It may also inform development of methods to identify GBS carriers whose infants are at risk.
Background: For objectives and case definitions please see www.apsu.org.au

Results: During the three years of surveillance there were 183 notifications and 101 confirmed cases. The median age was 12.2 years (range 5-13) and 25% of confirmed cases were boys. The median weight loss among the children was 7kg and the weight loss was greatest among children aged 9 years or more. Nineteen girls reached menarche and 18 of these had secondary amenorrhea.

Symptoms included abnormal cognitions such as preoccupation with food (90%), fear of weight gain or fat (74%), preoccupation with weight (73%) and perception that body is larger (66%). Depression and anxiety were the most commonly reported co-morbidities with at least one psychological morbidity present in 62%. Excessive exercise was described in 54% and self-induced vomiting in 11% of cases.

Approximately a third of the confirmed cases had symptoms of significant medical instability including bradycardia in 40%, hypothermia in 33% and hypotension in 20%. The proportion of children with significant medical instability suggests that they are presenting to specialist child health professionals in the advanced stages of the illness.

According to DSM-IV, 67% of children met both psychological criteria for Anorexia Nervosa while only 51% met the weight loss criteria (85% of ideal body weight), despite 61% having potentially life threatening complications of malnutrition. This highlights the need for a review of DSM-IV criteria when applied to young children undergoing rapid natural growth.

For case classification details and reported rates please see Tables 3 & 4, page 12-14

Study Highlights and Impacts:

- Young children aged 5 to 13 years with eating disorders do indeed present with significant weight loss and associated psychological and medical complications.
- These data will provide a very valuable contribution to the debate on definition and classification of eating disorders among young children.

Original Articles: None
presentations:


Background: For objectives and case definitions please see www.apsu.org.au

Results: Since 2004, there were 88 notifications and the questionnaire return rate was 80% (n=70). There were 52 confirmed cases, 13 errors and five duplicate reports. A breakdown of cases by state revealed that 59% of cases are from NSW and there were no reports from Tasmania or the Northern Territory in 2005-2006.

Of the 52 confirmed cases, 40% were homozygous sickle cell anaemia, 25% haemoglobin II disease, 10% beta thalassemia major and the remainder a variety of other disorders. One patient, with sickle cell anaemia, died during the course of the study.

Of the cases confirmed, 70% were born in Australia with the rest being immigrants. Nearly half of the mothers and 30% of the fathers knew of their carrier status prior to the pregnancy. Only 30% of these parents had the risks of having a child with haemoglobinopathy explained to them prior to pregnancy.

For case classification details and reported rates please see Tables 3 & 4, page 12-14

Study Highlights and Impacts:
- A significant number of children with serious haemoglobinopathies are born in Australia each year with an additional number migrating to Australia.
- Although screening has increased over the last few years, the implications of carrier status for the infant are often overlooked with only 30% of parents who were carriers having the risks explained to them prior to pregnancy.
- There is a need for raising awareness among clinicians and carriers of the risks associated with haemoglobinopathy.
**Background:** For objectives and case definitions please see www.apsu.org.au

**Results:** During 2003-2006, the return rate of detailed questionnaires was 85% and of 87 HCV notifications to the end of 2006, 41 were confirmed as HCV, 9 were duplicate reports, 22 were reporting errors, 2 were probable cases and 13 had missing data. Most HCV infected children were born in Australia (97%) to an Australian born mother (where maternal birth place was known) who was HCV-infected (93%). Other childhood risk factors for HCV included IV drug use in the child (3/38). Of the 3 children with documented IV drug use, 2 had HCV negative mothers, and the HCV status of the other child’s mother was unknown. Maternal risk factors for HCV infection included maternal IV drug use in 29 (74%), invasive procedures in 3, tattoos in 11 (3 of whom also had a history of IV drug use), vaccination (1) and home electrolysis (1). Both the vaccination and home electrolysis occurred in an HCV endemic country. The median age at diagnosis of HCV in the child was 2.6 years (range 1m-15y) and 67% of children were diagnosed at less than 5 years of age. Most HCV infected children were asymptomatic at diagnosis. Reported clinical features at diagnosis were: lethargy (2), bruising (1), hepatomegaly (2) and failure to thrive (1, in a child with lethargy). Mildly elevated alanine transaminase levels at diagnosis were recorded in 81% of the cases.

For case classification details and reported rates please see Tables 3 & 4, page 12-14

**Study Highlights and Impacts:**

- The majority of HCV infected children in Australia are born to HCV infected mothers, and are asymptomatic at diagnosis with mildly abnormal liver function tests. Some mothers had more than one risk factor recorded.

- The reported number of infected children is lower than predicted by Federal de-identified laboratory notifications. This may be a result of under-diagnosis and/or under-reporting and this discrepancy is being explored.

**Original Articles:**


**Abstracts:**


**Presentations:**


Elliott E. Reported risk factors for Hepatitis C Virus Infection in Australian children results of National Surveillance. Royal Australasian College of Physicians Annual Scientific Meeting, Wellington NZ, 2005 (Finalist, Rue Wright Award).
Hyperinsulinaemic Hypoglycaemia of Infancy (HI)
R Greer, A Cotterill, R Walker, D Cowley, J Bell, M Thomsett, M Jack

**Background:** For objectives and case definitions please see [www.apsu.org.au](http://www.apsu.org.au)

**Results:** Clinical data were analysed for 43 infants and children reported during 2005 and 2006. Thirty-three (77%) presented in a neonatal unit, 4 at an emergency facility, and 2 at other centres. Ten had a seizure at presentation, and others had a variety of signs such as jitteriness, floppiness, or a staring episode. Nineteen were diagnosed through routine neonatal surveillance. The mean birth weight was 3068±820g, range 1625-4740g. No definitive diagnosis was specified in 38 (93%), but one infant each was diagnosed with Beckwith-Wiedemann Syndrome, Congenital Disorder of Glycosylation, and likely ABCC8 mutation. Fifteen infants received ongoing treatment with diazoxide. Case follow-up after discharge from the neonatal unit was not possible, due mainly to the de-identification of case data collected through the APSU mechanism.

This study highlights the difficulties in determining a definitive diagnosis of HI, the need for increased awareness among clinicians of this condition, and the need for improved diagnostic services. It is not possible to reliably estimate incidence of HI from this study, as we speculate that many cases were associated with low birthweight, unlikely to require long-term diazoxide or to be associated with a genetic abnormality. Genetic diagnosis for rare conditions is hampered by the high cost of mutational analysis.

*For case classification details and reported rates please see Tables 3 & 4, page 12-14*

**Study Highlights and Impacts:**
- Delays in the recognition of hypoglycaemia and commencement of effective treatment have resulted in the past in permanent neurological impairment in up to 50% of patients.
- Severe HI associated with ABCC8 or KCNJ11 mutations is thought to occur in 1/50,000 births.
- This study has the potential to improve clinical outcomes by documenting the epidemiology and causes of HI in Australian infants.
- We plan to produce and disseminate a list of differential diagnoses for HI, including common genetic defects.

**Original Articles:** None

**Abstracts:**
HIV Infection, AIDS and Perinatal Exposure to HIV

A McDonald, J Kaldor, K Nadew, J Ziegler, E Elliott

Background: For objectives and case definitions please see www.apsu.org.au

Results: A total of 283 children perinatally exposed to HIV have been reported between 1993 and 2006. The proportion of children acquiring HIV infection born to women diagnosed antenatally was only 8.8%, while 52.1% of children born to women diagnosed postnatally acquired HIV infection. This reflects lack of opportunity to prevent transmission of HIV to the child among women diagnosed postnatally. In the past five years, 110 cases of perinatal HIV exposure were notified, predominantly through the APSU (90%), with 11 cases notified through national HIV surveillance activities.

Of the 48 definite cases of perinatal exposure to HIV notified in 2005 – 2006, 45% were reported from NSW, 31% from VIC, 17% from QLD, 5% from SA and 2% from WA.

The mother’s HIV infection was diagnosed antenatally in 38 mother-child pairs. Use of antiretroviral therapy in pregnancy and avoidance of breastfeeding was reported in 33; mode of delivery was elective caesarean in 23, emergency caesarean in 4 and vaginal delivery in 6; use of intervention was not reported in 5 cases. One child (2.6%) acquired HIV infection despite the reported use of all three interventions by the mother. Of the 4 children born to women diagnosed postnatally, 3 children acquired HIV infection. Two of these children were born in countries in sub-Saharan Africa.

In 2005-2006 the mother’s risk for HIV infection was heterosexual exposure in a high prevalence country (42.5%), predominantly in sub-Saharan Africa, or heterosexual contact with a partner from a high prevalence country (17.5%), an injecting drug user (10%), a bisexual man (2.5%), heterosexual contact not further specified (25%) and an other/undetermined risk (2.5%). This trend remains unchanged for the last 5 years.

For case classification details and reported rates please see Tables 3 & 4, page 12-14

Study Highlights and Impacts:

- National surveillance indicates that perinatal exposure to HIV and mother-to-child HIV transmission remains rare among children in Australia.
- HIV transmission continues among children whose mother’s HIV is diagnosed postnatally and among women who do not make use of interventions known to decrease transmission.
- The APSU makes a substantial contribution to monitoring perinatal exposure to HIV in Australia and was the only source of information in 90% of cases reported in the last 5 years.
- Many women acquire HIV through heterosexual contact and interventions are available to prevent perinatal HIV transmission.
- The 2006 National HIV Testing Policy recommends that HIV testing should be routinely offered to all women antenatally.

Original Articles: None

Presentations:


Surveillance Reports:

Neonatal Herpes Simplex Virus (HSV)
C Jones, D Isaacs, P McIntyre, T Cunningham, S Garland

**Background:** For objectives and case definitions please see www.apsu.org.au

**Results:** Prospective national surveillance of neonatal HSV disease commenced in Australia in 1997. Between 1997-2006, there were 88 confirmed and 3 probable cases, 56% percent of which were caused by HSV-1. The majority of infants were born to primiparous women (51%), who were over 18 years of age (96%). Thirty four percent of infants were preterm (< 37 weeks), including 5.7% born before 28 weeks. Where reported, 56% of infants were born by normal vaginal delivery, 27% by caesarean section, and 9% by instrument-assisted delivery. A potential source of postnatal HSV transmission was reported in 11 cases, including 2 cases where the infection may have been hospital-acquired. In the remainder, only 17% of mothers and 5% of fathers had a history of prior genital herpes. Data on maternal serology was not provided in most cases. Forty percent of infants presented with localised mucoepithelial disease including 14% with eye involvement but 23% had multi-organ involvement and the remainder had pneumonitis or encephalitis alone. Sixty-six percent of infants received antiviral therapy with acyclovir, at a mean age of 14 days for a mean duration of 14 days. All but one of the nine infants who did not receive therapy died from their infection. The overall mortality rate was 25%, despite the availability of effective antiviral therapy.

For case classification details and reported rates please see Tables 3 & 4, page 12-14

**Study Highlights and Impacts:**
- Herpes simplex virus is an important neonatal pathogen with an incidence that ranges from 1:3,500 live births in the USA, to 1:10-50,000 live births in the UK and Australia.
- Neonatal infection manifests as disease localised to the skin, eye or mouth, as encephalitis, or as a highly lethal disseminated infection. Long term sequelae include developmental delay, seizures, and motor and visual impairment.
- The mortality associated with all but localised disease remains high despite the availability of antiviral agents.
- Recent (partial) successes in the development of a vaccine against genital herpes may see the future introduction of a prophylactic vaccine against maternal HSV infection.
- Prospective surveillance provides invaluable information and may be the means of assessing the effect of future maternal genital herpes vaccination programs on these devastating sequelae.

**Original Articles:** None

**Abstracts:**


Jones CA. “HSV in the newborn.” XXIInd Cornea and Eye Bank Meeting, Sydney Eye Hospital, February 2005.

Presentations:


Jones CA. “HSV in the newborn.” Abstracts of the XXIInd Cornea and Eye Bank Meeting, Sydney Eye Hospital, February 2005


Non Tuberculous Mycobacterial Infection (NTMI)
P Palasanthiran, C Blyth, E Best, C Jones, A Daley, G Henry, D Burgner, C Nourse, P Goldwater

Background: For objectives and case definitions please see www.apsu.org.au

Results: Ninety cases (38 confirmed, 52 probable) have been included in the analysis to date. The incidence of NTM infection in Australian children is estimated to be <1 case per 100,000 children <15 years old. Lymphadenitis is the most frequent presentation (73%) and usually occurs without systemic features. Pulmonary and disseminated infection is seen infrequently (13% and 2% respectively). Most children affected have no predisposing condition. Biopsy is frequently used for diagnosis and skin tests were infrequently used. On biopsy, histopathological examination is more frequently positive than microbiological examination. Mycobacterium avium intracellulare is the most commonly isolated organism in Australian children. Surgery was performed in 77% of cases and 38% of children were prescribed antimicrobials. Marked heterogeneity was observed in the types of antimicrobials and regimens prescribed. In non tuberculous mycobacterial lymphadenitis, total lymph node excision is associated with a lower risk of relapse than incomplete surgery. Despite therapy, recurrence occurred in up to 25% of the cases that were followed up.

For case classification details and reported rates please see Tables 3 & 4, page 12-14

Study Highlights and Impact:
• The incidence of NTM infection in Australian children is estimated to be <1 cases per 100,000 children.
• Lymphadenitis is the most frequent presentation.
• Most children affected have no predisposing condition.
• M. avium-intracellulare is the most commonly isolated organism.
• There is significant variation in surgical and medical therapies administered by Australian doctors.
• Recurrence was documented in 25% of cases.

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Original Articles: None
Abstracts:
Rett Syndrome
H Leonard, C Bower, N de Klerk, S Silburn, L Nagarajan, S Fyfe, J Christodoulou, C Ellaway, H Woodhead, S Reilly, D Ravine

Background: For objectives and case definitions please see www.apsu.org.au

Results: We have shown that in Rett syndrome the onset and course of epilepsy are related to the genotype. In particular, the likelihood of seizure onset can, at the time of diagnosis, be predicted to some extent from the child’s earlier developmental history and genetic status. Our findings have relevance to understanding the biological consequences of the MECP2 mutations and to provision of practical clinical information.

We were also able to show that the median age at scoliosis onset was 9.8 years and that three quarters of subjects had developed scoliosis by 13 years of age. Children with compromised early development (< six months), those who were less mobile at ten months, and those who never walked, were more likely to have an earlier onset of scoliosis. The p.R294X mutation appeared to provide some protective effect against the development of scoliosis.

Although it is generally believed that the effect of a specific genotype on the phenotype is also modulated by the effects of X-inactivation, research evidence for this has been relatively sparse. By combining our Australian population-based data with cases from the UK and with the appropriate laboratory expertise from the University of Cardiff, it was possible to explore the association between clinical severity in two common mutations. We were able to demonstrate a statistically significant increase in clinical severity as the proportion of active mutated allele increased for both the p.R168X and p.T158M mutation. This has been the first study to show a quantitative relationship between the degree and direction of X inactivation and clinical severity overall in Rett syndrome.

For case classification details and reported rates please see Tables 3 & 4, page 12-14

Study Highlights and Impacts:
- Analytical investigations using data relating to different aspects of the study continue to be undertaken and during 2006 ten articles relating to the study were published.
- The continuation of a consumer reference group which meets intermittently by teleconference and ensures family representation and input to the study.
- Production of the 2006 Australian Rett Syndrome Study report utilizing data collected from family questionnaires.
- The identification of a number of Australian males with a neonatal encephalopathic picture and the presence of a MECP2 mutation.

Original Articles:
Fyfe, S; Downs, J; McIlroy, O; Burford, B; Lister, J; Reilly, S; Laurvick, CL; Philippe, C; Msall, M; Kaufmann, W E; Ellaway, C; Leonard, H. Development of a video-based evaluation tool in Rett syndrome. Journal of Autism & Developmental Disorders 2007; 37(9): 1636-46.


Archer, H; Evans, J; Leonard, H; Colvin, L; Ravine, D; Christodoulou, J; Williamson, S; Charman, T; Bailey, M; Sampson, J; de Klerk, N; Clarke, A. Correlation between clinical severity in Rett syndrome patients with a p.R168X or p.T158M MECP2 mutation and the direction and proportion of X chromosome inactivation. Journal of Medical Genetics 2007; 44(2): 148-152.


Abstracts: none

Presentations:
**Surveillance Study Reports**

**Vitamin K Deficiency Bleeding**

K Chant, E Elliott, B Jalaludin, D Henderson-Smart, P McDougall, P Laughnan, L Taylor

**Background:** For objectives and case definitions please see [www.apsu.org.au](http://www.apsu.org.au)

**Results:** Since 1993, 125 notifications have been received and questionnaire return rate was 98% (n=122). There were 30 errors, 33 duplicates and 28 unclassified notifications. There were 25 confirmed and 6 probable cases of Vitamin K Deficiency Bleeding (VKDB).

The study is still in progress and we are currently analysing trends over time (1993-2006) to assess the implications of a change in the mode of vitamin K administration. Of the 25 cases of VKDB, 20 were late onset cases and five early/classical cases of VKDB. Of the 20 late onset cases, liver disease was present in 11 infants. Six infants with definite VKDB did not receive vitamin K at birth. Three died (two of the deaths were in infants with liver disease and the other death was in an infant without liver disease who did not receive vitamin K at birth). Final results for this study will be available at the next annual report.

For case classification details and reported rates please see Tables 3 & 4, page 12-14

**Study Highlights and Impacts:**

- During the data collection period, changes to policy on the mode of administration of vitamin K in newborns (introduction of oral preparations) were implemented, allowing the assessment of the impacts of this policy change, particularly in terms of incidence of VKDB.
- Most children with vitamin K deficiency bleeding did not receive vitamin K at birth or received insufficient Vitamin K.

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**Original Articles:** None

**Abstracts:** None
**Surveillance Study Reports**

**Simple Vitamin D Deficiency Rickets (SVDD)**
C Munns, M Zacharin, C Rodda, E Davis, M Harris, J Batch, M Pascoe, J Fairchild, A Lafferty, A Whybourne, L Ward, R Morley, S Garnett, D Burgner, M Williams, Y Zurynski

**Background:** For objectives and case definitions please see www.apsu.org.au

**Results:** During 2006, 654 notifications of SVDD were made, with 256 confirmed cases. 65% were reported from Victoria, 20% from WA, 11% from NSW, 0.6 % from QLD, 0.9% from SA, 1.4% from Tasmania, 0.6% from ACT and 0.2% from NT. Mean age at diagnosis was 5.8 yrs±4.8. Presenting features included bone pain (6.3%), poor growth (5.5%), limb deformity (13%) and hypotonia (2%). Eighty-two percent of cases had dark skin. Seventy-one percent of the affected children were born outside Australia (Sudan 34%, Egypt 9%, 28% other). All but one of the mothers was born outside Australia and 93% were veiled during pregnancy for cultural or religious reasons. Majority of the cases were identified in refugee clinics in Melbourne, Perth and Sydney during routine screening.

For case classification details and reported rates please see Tables 3 & 4, page 12-15

**Study Highlights and Impacts:**
- This study suggests that Vitamin D Deficiency Rickets is not as rare in Australia as initially thought.
- The preliminary data confirm that SVDD in Australia is associated with significant morbidity and its incidence is highest amongst recent migrants to Australia and those with darker skin colour.
- If confirmed, this will have to be addressed through public health campaigns that incorporate all levels of government and the health care system.

**Original Articles:**

**Abstracts:** None
Serious Seatbelt Injuries
Y Zurynski, E Elliott, L Bliston, M McCaskill, A Dilley, F Leditschke

Background: For objectives and case definitions please see www.apsu.org.au

Results: In 2006, 30 cases of injuries related to inappropriate seatbelt use were identified. There were 16 males and 14 females aged between 3 and 12 years (mean age = 6.9), and 70% of injured children were in the 4 to 9 age group. Most injured children (70%) had been restrained by an adult lap-sash belt without a booster seat, while 20% were using booster seats and the remainder were travelling while restrained by a lap-only belt. Approximately one third were travelling in the front seat and another third in the rear centre position. Abdominal injuries were most common (76.7%) and included lacerations, haematomas and tears of the liver, spleen, kidneys and duodenum. Head and neck injuries were sustained by 38.7% and spinal injuries by 26.7%. The spinal injuries predominantly included lumbar-spine fractures associated with hyperextension of the lumbar spine. The most severe head, spinal and abdominal injuries were among younger children misusing adult seatbelts by placing the sash portion on the abdomen, under the arm or behind the back. Nineteen children required surgical intervention, mainly laparotomy for abdominal injuries. Fifteen children were admitted to a paediatric intensive care unit (average stay = 3.2 days; range: 1 to 11 days) and the average hospital stay was 15 days (range: 1 to 103 days). One child sustained a spinal cord injury leading to paraplegia and one child died due to severe head injuries.

For case classification details and reported rates please see Tables 3 & 4, page 12-14

Study Highlights and Impacts:
• Despite the reported high use of seatbelts in Australia (>92%), children inappropriately restrained by adult seatbelts suffer significant abdominal, lumbar spine, and head injuries in motor vehicle accidents.
• Current Australian laws mandate child restraints only for children aged up to 12 months and children aged 12 months or more may be restrained in either, a child restraint, a booster seat or an adult seatbelt.
• Results from this study will inform the current review of child restraint laws by the Australian Transport Commission.

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Congenital Varicella
R Booy, D Burgner, M Nissen, J Buttery, Y Zurynski, E Elliott, M Gold, E Peadon

Background: For objectives and case definitions please see www.apsu.org.au

Results: This study commenced in May 2006. There was one case of Congenital Varicella reported to the end of 2006. The infant had cicatricial skin scars and developed herpes zoster at 5 months of age. The exposure occurred in the 2nd trimester. In the previous APSU Congenital varicella study (1995-97), there was an average of 2.3 confirmed cases per year.

For case classification details and reported rates please see Tables 3 & 4, page 12-14

Study Highlights and Impacts:
• Congenital varicella is a rare but serious consequence of varicella infection.
• Ongoing surveillance is needed to determine if the national varicella immunisation program has an impact on the incidence of congenital varicella.

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Original Articles: None
Abstracts: None

Original Articles:

Abstracts: None
Neonatal Varicella
R Booy, D Burgner, M Nissen, J Buttery, Y Zurynski, E Elliott, M Gold, E Peadon

**Background:** For objectives and case definitions please see www.apsu.org.au

**Results:** This study commenced in May 2006 and these results are preliminary. There were eight confirmed cases of neonatal varicella infection reported to the end of 2006. All infants were born at term. The median age at onset of varicella infection was 16 days (range 10 to 22 days). Skin lesions were the only clinical feature in all eight infants. These infants were given zoster immunoglobulin. Five infants were admitted to hospital and treated with intravenous aciclovir. The infecting contact was a first degree relative living in the same household for seven infants. Six of the contacts were adults (five mothers, one father). Five infecting contacts were unvaccinated and the vaccination status of the other three was unknown.

For case classification details and reported rates please see Tables 3 & 4, page 12-14

**Study Highlights and Impacts:**
- The most common infecting contacts reported are unvaccinated adults.
- Two thirds of affected infants required hospital admission.
- Two thirds were not given zoster immunoglobulin. One third did not receive anti-viral therapy.
- There is a need for well disseminated guidelines on the management of perinatal exposure to varicella.

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Original Articles:

Abstracts: None

Severe Complications of Varicella Infection
R Booy, D Burgner, M Nissen, J Buttery, Y Zurynski, E Elliott, M Gold, E Peadon

**Background:** For objectives and case definitions please see www.apsu.org.au

**Results:** This study commenced in May 2006 and these results are preliminary. There were thirteen confirmed cases of severe complications of varicella infection to Dec. 2006. The median age was 3 years (range 10 months to 12 years). Clinical features included bacteraemia (4), septic arthritis and/or osteomyelitis (3), pneumonia (3) and neurological complications (2). Streptococcal organisms were isolated in four children and *Staphylococcus aureus* in five children, including two MRSA isolates. All children were admitted to hospital and the median length of stay was eight days (range 2 to 14 days). Three children had ongoing problems at discharge (2- neurological; 1- dermatological). Twelve of the 13 children were not vaccinated against varicella. Infecting contacts were all children including two unimmunised siblings. Samples from vesicular lesions have been obtained from some cases and genotyping is ongoing.

For case classification details and reported rates please see Tables 3 & 4, page 12-14

**Study Highlights and Impacts:**
- 92% of the cases admitted to hospital with severe complications were unvaccinated.
- Regular collection and analysis of vesicle samples will help to monitor whether the viral pathogen is mutating.
- This study will assist in describing the effectiveness of the vaccination program over time.

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Original Articles:

Abstracts: None
Neuromuscular disorders of childhood

BACKGROUND

Neuromuscular disorders have very variable signs and symptoms, severity and impact on quality of life and life span. Diagnosis of these conditions is based on clinical, neurophysiologic, pathologic and genetic criteria (Table). Recent advances in these areas have resulted in a marked increase in the complexity of classification of many of these conditions.

Worldwide incidence and prevalence data for neuromuscular conditions in children are often outdated and incomplete. There are no such Australian data. International studies have shown considerable variability in the incidence of specific conditions in different populations and ethnic groups [1-7], and the effect of antenatal diagnosis on disease incidence is generally unknown. While these disorders are individually rare, the impact of a single child with a neuromuscular disorder upon the family and community can be enormous. Affected children require extensive community and hospital services for diagnosis, management and therapy, hospitalisations, access to and assistance with school, adaptive equipment and home modification, respite care, and social and financial support. Support services are largely dependent on state or federal funding, which is contingent upon perceived need. In the absence of accurate epidemiologic data, such services may be inadequately funded.

Better epidemiologic data is required to secure adequate provision and funding of clinical, diagnostic and research services in order to maintain the current high standard of care for paediatric neuromuscular disorders in Australasia.

STUDY OBJECTIVES

1. To describe the epidemiology of inherited and chronic auto-immune neuromuscular disorders diagnosed in Australian children, including:
   a. Type and frequency
   b. Family history
   c. Clinical presentation
2. To determine methods of diagnosis of these disorders in Australia.

CASE DEFINITION

Please report any child seen in the last month, aged 15 years or less, with a newly diagnosed inherited or chronic auto-immune neuromuscular disorder as described in the table below.

Inherited neuromuscular disorder refers to any genetic disorder of the lower motor neuron i.e. disorders of anterior horn cell, motor and/or sensory peripheral nerve, neuromuscular junction or muscle.

Chronic auto-immune neuromuscular disorders are acquired immune-mediated disorders of peripheral nerve, neuromuscular junction or muscle causing permanent or persistent (>3 months duration) symptoms. These disorders include chronic inflammatory demyelinating polyneuropathy (CIDP), myasthenia gravis and dermatomyositis.

FOLLOW-UP OF REPORTED CASES

A brief questionnaire requesting further details will be forwarded to responders reporting a newly diagnosed case.

INVESTIGATOR CONTACT DETAILS (*Principal Investigator)

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A/Prof Andrew Kornberg, Head, Department of Neurology, Royal Children’s Hospital Melbourne Vic.
Dr Phillipa Lamont, Head, Neurogenetics Unit, Royal Perth Hospital, WA
Prof. Kathryn North, Head, Neurogenetics Research Unit, The Children’s Hospital at Westmead, NSW
Dr Peter Rowe, Department of Neurology, Princess Margaret Hospital, Perth
Dr Kate Sinclair, Head, Neurology Department, Royal Children’s Hospital Brisbane

REFERENCES

### Table: Case definitions

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Clinical characteristics</th>
<th>Method of diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Congenital myopathies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEMALINE MYOPATHY</td>
<td>Congenital myopathy: proximal weakness, hypotonia. Classification into severe, intermediate and typical congenital, childhood-onset and adult-onset forms.</td>
<td>Diagnostic: Muscle biopsy: rod-shaped bodies on LM. Diagnostic: Genetic testing for ACTA1, TPM3, or other causative mutations. Exclusions of other conditions causing development of nemealine bodies.</td>
</tr>
<tr>
<td>MYOTUBULAR (CENTRONUCLEAR) MYOPATHY</td>
<td>Congenital myopathy affecting the extraocular, facial, neck &amp; limb muscles. Classification: severe X-linked neonatal, later-onset milder forms (autosomal recessive and dominant).</td>
<td>Diagnostic: Muscle biopsy: central nuclei in extraocular muscles. Diagnostic: Genetic testing for MTM1, DNM2 or other causative mutations.</td>
</tr>
<tr>
<td>CONGENITAL FIBRE-TYPE DISPROPORTION</td>
<td>Congenital myopathy with weakness, hypotonia +/- multiple joint contractures.</td>
<td>Diagnostic: Muscle biopsy: disadvantage in size between type 1 and type 2 muscle fibres. Diagnostic: Genetic testing for TPM2, ACTA1, SEPN1 or other causative mutations.</td>
</tr>
<tr>
<td>MINCORE MYOPATHY</td>
<td>Congenital myopathy often associated with contractures and scoliosis. Variable association with ophthalmoplegia and respiratory insufficiency.</td>
<td>Diagnostic: Muscle biopsy: multiple small cores (minicores) within muscle fibres. Diagnostic: Genetic testing for SEPN1, RYR1 or other causative mutations.</td>
</tr>
<tr>
<td><strong>Muscular dystrophies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONGENITAL MUSCULAR DYSTROPHIES</td>
<td>Genetic myopathies presenting at &lt;2 years of age with weakness and hypotonia. Variable elevation of serum CK.</td>
<td>Diagnostic: Genetic testing: where available Diagnostic: Muscle biopsy: dystrophic pattern, no specific EM changes, variable abnormalities on ICC.</td>
</tr>
<tr>
<td>FACIOSCAPULOHUMERAL MUSCULAR DYSTROPHY</td>
<td>Slowly progressive form of muscular dystrophy with onset &gt;30 yrs. Weakness in the facial, scapular and humeral muscles. Autosomal dominant inheritance.</td>
<td>Diagnostic: Genetic testing: decrease in the number of repeats of a 3.3 kb tandem repeat sequence (D4Z4) on chromosome 4q35.</td>
</tr>
<tr>
<td>LIMB-GIRDLE MUSCULAR DYSTROPHY</td>
<td>Slowly progressive form of muscular dystrophy. Weakness preferentially affecting the shoulder or pelvic girdle muscles and generally sparing the face. Dominant or recessive inheritance.</td>
<td>Diagnostic: Diagnostic Western blot or genetic testing by a reference laboratory. Supportive: Dystrophic changes on muscle biopsy. Supportive: Muscle ICC: characteristic changes in some forms of LGMD.</td>
</tr>
<tr>
<td>DERMATOMYOSITIS</td>
<td>An idiopathic inflammatory myopathy with characteristic cutaneous findings, causing myalgia, proximal weakness and variable involvement of the skin.</td>
<td>Diagnosis based on clinical presentation. Supportive: EMG or pathologic evidence of an inflammatory/ necrotizing myopathy.</td>
</tr>
</tbody>
</table>

New Studies for 2007

Acute Intussusception

BACKGROUND

Intussusception (IS) is the most common cause of bowel obstruction in infants and young children with a peak incidence at 4 to 10 months of age [1]. IS occurs when one segment of the bowel becomes enfolded within another segment. If this obstruction is not relieved, the vascular supply to the bowel becomes compromised resulting in bowel ischaemia and death. The symptoms and signs in children presenting with IS reflect this underlying pathophysiology. Intestinal obstruction results in vomiting, abdominal distension and abnormal or absent bowel sounds. The IS and associated oedema may be identified as a mass on abdominal examination. Obstruction to the venous return or arterial supply of the intestine may result in rectal bleeding or the classic “red current jelly” stool. Occasionally patients present in shock due to severe vascular compromise of the intestine, and, if untreated, IS may be fatal [1]. The diagnosis of IS is confirmed on air/liquid contrast enema, abdominal ultrasound or at surgery. If diagnosis is by ultrasound, this should include the demonstration of an intra-abdominal mass by abdominal ultrasound with specific characteristic features (target sign or doughnut sign on transverse section and a pseudo-kidney or sandwich sign on longitudinal section) that is proven to be reduced by hydrostatic enema on post-reduction ultrasound. IS is treated by air or hydrostatic reduction enema under x-ray or ultrasound guidance, or by surgery. About 10% of patients require an intestinal resection due to vascular injury to the intestine [1].

Rotavirus infection is the leading cause of severe dehydrating gastroenteritis responsible for >500,000 deaths per year in children <5 years of age worldwide [2]. The development of a rotavirus vaccine for the children of the developing world is an important component of the UN Millennium Development Goals. There was great optimism when the first oral rotavirus vaccine was licensed in the U.S. (Rotashield®, Wyeth). The vaccine was highly efficacious for the prevention of severe diarrhoea and hospitalisation due to rotavirus infection [3-5]. However, Rotashield® was withdrawn 9 months after introduction due to an uncommon association with IS [6-8]. This was a major setback in efforts to reduce the global burden of rotavirus disease. Although the risk of development of IS associated with receipt of Rotashield® vaccine is estimated to be <1 in 12,000 vaccine recipients it has had important implications for clinical trials of other rotavirus vaccine candidates. Alternate rotavirus vaccines (Rotarix®, GSK and Rotateq®, Merck) have been shown to be safe and effective in clinical trials of >65,000 infants however their safety and performance outside the clinical trial setting in a range of potential clinical or epidemiological scenarios has not been demonstrated [9, 10]. Therefore, post-market (or post-licensure) surveillance will be an important tool for the detection of rare or unexpected vaccine related adverse events. Both the Rotarix® and Rotateq® vaccines have recently been incorporated into the National Immunisation Program (NIP) as federally funded vaccines. Universal immunisation against rotavirus is currently being discussed with WHO and other relevant bodies. As these vaccines are introduced it is important to monitor for IS to establish if there is any temporal association with receipt of a rotavirus vaccine and IS in Australian children. Investigation of possible risk factors for IS may provide an insight into the aetiology of IS in unvaccinated and vaccinated infants.

The Australian Paediatric Surveillance Unit (APSU) was established in 1993 to provide information about rare paediatric diseases in Australia. It is a Unit of the Royal Australasian College of Physicians, Division of Paediatrics. It partially supports an annual academic meeting of Paediatric Gastroenterologists in Australia. It is a Unit of the Royal Australasian College of Physicians, Division of Paediatrics. It partially supported by a grant from the Department of Health and Aging, Commonwealth of Australia and an NHMRC Enabling Grant. Between 1993 and 2004, the APSU monitored 34 uncommon childhood conditions. A comprehensive list of the studies conducted through the APSU since inception are documented on the website www.apsu.org.au. The APSU provides a unique mechanism to conduct surveillance on rates of intussusception following introduction of a universal rotavirus vaccine program in Australia.

HYPOTHESIS

Rotavirus vaccines (Rotarix and Rotateq) recently introduced into Australia are not associated with a significant increase in the incidence of IS in infants ≤ 24 months of age.

STUDY AIMS

1. To document the incidence of acute IS in infants ≤ 24 months
2. To document any temporal relationship between the development of IS and receipt of a rotavirus vaccine or other vaccines
3. To describe the clinical presentation, diagnosis, management and short term outcome of IS

STUDY METHODS

Each month all clinicians (paediatricians, paediatric surgeons, paediatric radiologists, emergency room physicians) in Australia will be sent either a reply-paid report card or an e-mail “card” listing conditions currently being studied through the APSU. Clinicians are asked to report children newly diagnosed with any of the conditions listed. Investigators conducting the IS study at RCH are informed weekly of new cases reported by APSU contributors. The IS investigators will then send a brief questionnaire to the clinician requesting further de-identified information.

The data will be collected by the IS study investigators with the assistance of local investigators in each state (Vic – Prof Julie Bines; NSW – Dr Robert Booy; QLD – Dr Michael Nissen; NT – Dr Vikki Krause; WA – Dr Peter Richmond; SA – Dr Michael Gold; Tas – Dr Sean Beggs) and stored and analysed at the Study Centre at RCH. Investigators at RCH
New Studies for 2007

(Professor Julie Bines, Dr Jim Buttery, Dr Margie Danchin) are responsible for collation, analysis and publication of this data, and for reporting study findings annually to the APSU. A dedicated and secure computer database will be established to manage data. A 2 year period of surveillance is proposed to account for any season variability in the natural incidence of intussusception.

CASE DEFINITION

Please report all cases of newly diagnosed acute intussusception in a child aged ≤24 months where intussusception is confirmed on air/liquid contrast enema, ultrasound or surgery. If diagnosis is by ultrasound, this should include the demonstration of an intra-abdominal mass by abdominal ultrasound with specific characteristic features (target sign or doughnut sign on transverse section and a pseudo-kidney or sandwich sign on longitudinal section) that are proven to be reduced by hydrostatic enema on post-reduction ultrasound.

Virological Testing

Due to previous studies identifying 40% of IS cases positive for adenovirus in their stool [12], for best clinical practise a stool sample is to be collected for each patient and sent to your local laboratory to be tested for adenovirus and rotavirus. De-identified copies of the results should be sent with the completed questionnaire in the reply paid envelope provided.

Analysis

Data will be analysed with the assistance of the APSU, Co-investigators and CEBU at MCRI/RCH. Group data analysis will be provided annually to the APSU for publication in the Annual Report. It is anticipated that data will be presented at scientific meetings and published in scientific journals.

INVESTIGATOR CONTACT DETAILS (*Principal Investigator)

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Professor Robert Booy, National Centre Immunisation Research (NCIRS), The Children's Hospital at Westmead, WESTMEAD, NSW

Dr Michael Nissen, Paediatric Infectious Disease Laboratory, Royal Children's Hospital, HERSTON, QLD

Dr Vikki Krause, Diseases Control Centre, Royal Darwin Hospital, TIWI NT

Dr Peter Richmond, UWA School of Paediatrics & Child Health, Princess Margaret Hospital for Children, PERTH WA

Dr Michael Gold, Department of Paediatrics, Women's and Children's Hospital, NORTH ADELAIDE SA

Dr Sean Beggs, Royal Children's Hospital, Flemington Road, PARKVILLE VIC

REFERENCES


Acute Rheumatic Fever

BACKGROUND
Acute rheumatic fever (ARF) is a multi-system disease caused by an immunological response to group A streptococcal (GAS) infection. Children who have had ARF are susceptible to recurrent episodes when subsequent GAS infections occur. These recurrences often cause accumulated damage to heart valves (rheumatic heart disease - RHD), and consequent cardiac failure, the need for valve surgery or death. GAS infections and subsequent recurring ARF can be prevented by regularly administering penicillin as a regimen of secondary prophylaxis.

The highest documented rates of ARF and RHD in the world are found in Aboriginal Australians, and Maori and Pacific Islander people in New Zealand and Pacific Island nations. Aboriginal and Torres Strait Islander people are reportedly up to 8 times more likely than non ATSI people to be hospitalised for ARF and RHD, and nearly 20 times as likely to die.\(^{(1)}\) Approximately 43% of Aboriginal people with ARF or RHD in the Top End of the Northern Territory first present with established RHD.\(^{(2,3)}\) As most rheumatic valve lesions are the result of repeated or prolonged episodes of ARF in childhood and adolescence,\(^{(4)}\) these data suggest that the early episodes of ARF are not being diagnosed in many children in the Top End of NT.

ARF is predominantly, but not exclusively, a problem among Indigenous communities and our understanding of the epidemiology and impacts of ARF is currently restricted to the NT and QLD. However, there are no data on the incidence, management and outcomes for this debilitating condition for the southern regions of Australia where an estimated 57% of the Indigenous community lives. Furthermore, there are no data on the impact of ARF on children in other communities eg, immigrants and refugees.

This study aims to provide national data on ARF in Australian children and to determine where and in whom ARF is currently occurring. This study will also document recurrences of ARF and the extent of use of secondary prophylaxis. Using the information we will make recommendations on where ARF and RHD programs should be established to reduce the level of sickness and death that results from ARF and RHD.

STUDY OBJECTIVES
This study aims to:
- Estimate the incidence of ARF in the child population of Australia, particularly in regions from which there are currently no data, or only poor quality data.
- Determine the proportion of all ARF episodes that are recurrences.
- Identify populations, groups and regions at highest risk of ARF.

REPORTING INSTRUCTIONS
Please report any new episode of Acute Rheumatic Fever (even if there is a history of previous episodes) in any child <15 years of age and diagnosed according to the criteria provided in the case definition.

FOLLOW UP OF NOTIFICATIONS:
A brief questionnaire requesting details about the diagnosis will be sent to clinicians who notify a case of ARF to the APSU. In the event that Sydenham’s chorea is identified, a brief questionnaire on chorea will also be sent to clinicians who agree to participate in collection of chorea data (optional).

CASE DEFINITION
According to the National Heart Foundation Guidelines for Diagnosis and Management of ARF and RHD.\(^{(5)}\)

<table>
<thead>
<tr>
<th>High Risk Groups</th>
<th>All Other Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial episode of ARF</strong></td>
<td><strong>Recurrent attack of ARF (in a patient with known past ARF or RHD)</strong></td>
</tr>
<tr>
<td>2 major or 1 major and 2 minor manifestations</td>
<td>2 major or 1 major and 2 minor or 3 minor manifestations</td>
</tr>
<tr>
<td>Plus Evidence of a preceding GAS infection</td>
<td>Plus Evidence of a preceding GAS infection</td>
</tr>
</tbody>
</table>

**Major Manifestations**
- Carditis (including subclinical evidence of rheumatic valve disease on echocardiogram)
- Polyarthritis or aseptic mono-arthritis or polyarthralgia
- Chorea
- Erythema marginatum
- Subcutaneous nodules

**Minor manifestations**
- Fever
- ESR ≥30 mm/hr or CPR ≥30 mg/l
- Prolonged P-R interval on ECG

**Evidence of a preceding GAS infection**
- Elevated or rising antistreptolysin O or other streptococcal antibody, or a positive throat culture or rapid antigen test for GAS.
- Upper limits of normal for streptococcal antibody titres in Australia:

<table>
<thead>
<tr>
<th>AGE GROUP</th>
<th>UPPER LIMIT OF NORMAL (IU/ML)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(years)</td>
<td>ASO titre</td>
</tr>
<tr>
<td>4–5</td>
<td>120</td>
</tr>
<tr>
<td>6–9</td>
<td>480</td>
</tr>
<tr>
<td>10–14</td>
<td>320</td>
</tr>
</tbody>
</table>
INVESTIGATOR CONTACT DETAILS (*Principal investigator*)

*Prof Jonathan Carapetis, Director, Menzies School of Health Research, Darwin NT*

Ms Sara Noonan (Study coordinator and contact person) Menzies School of Health Research, C/- 8 Denham Drive VALLEY VIEW SA 5093 Tel (08) 8263 7801 sara.noonan@menzies.edu.au

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Professor Bart Currie Infectious Diseases Physician, Menzies School of Health Research, Darwin NT

Dr Malcolm McDonald Lecturer in Epidemiology, Menzies School of Health Research, Darwin NT

Dr Gavin Wheaton Paediatric Cardiologist Women’s and Children’s Hospital Adelaide SA

Assoc Prof Nigel Curtis Head of Paediatric Infectious Diseases Royal Children’s Hospital, Parkville, Vic

Professor Michael Nissen Director, Infectious Diseases, Royal Children’s Hospital, Brisbane QLD

REFERENCES


4. ABS, National Aboriginal and Torres Strait Islander Health Survey: Summary Booklet.

The International Network of Paediatric Surveillance Units (INoPSU) was established in 1998 to facilitate international collaboration among the 14 member paediatric surveillance units (PSUs) around the world. This collaboration allows for sharing of resources, simultaneous data collection and comparison across geographical regions. INoPSU have facilitated the surveillance of 70 rare conditions and have now undertaken 150 studies covering a child population of over 50 million children and involving over 10,000 clinicians (Table 5). Details on all of the activities of each surveillance unit are available from their respective websites and also from the INoPSU website (www.inopsu.com).

<table>
<thead>
<tr>
<th>Paediatric Surveillance Unit</th>
<th>Year Founded</th>
<th>Population &lt;15y (millions)</th>
<th>Participating clinicians (number)</th>
<th>Card return rate (%)</th>
<th>Questionnaire return rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australian Paediatric Surveillance Unit</td>
<td>1993</td>
<td>3.9</td>
<td>1247</td>
<td>97</td>
<td>86</td>
</tr>
<tr>
<td>British Paediatric Surveillance Unit</td>
<td>1986</td>
<td>12.7</td>
<td>2550</td>
<td>91</td>
<td>92</td>
</tr>
<tr>
<td>Canadian Paediatric Surveillance Program</td>
<td>1996</td>
<td>7.6*</td>
<td>2500</td>
<td>82</td>
<td>96</td>
</tr>
<tr>
<td>Cyprus &amp; Greece Paediatric Surveillance Unit</td>
<td>2003</td>
<td>1.3</td>
<td>110</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>German Paediatric Surveillance Unit</td>
<td>1992</td>
<td>12.0</td>
<td>462</td>
<td>98**</td>
<td>60-95**</td>
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<tr>
<td>Irish Paediatric Surveillance Unit</td>
<td>1996</td>
<td>1.5</td>
<td>150</td>
<td>80</td>
<td>80</td>
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<tr>
<td>Latvian Paediatric Surveillance Unit</td>
<td>1997</td>
<td>0.4</td>
<td>8</td>
<td>70</td>
<td>85</td>
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<tr>
<td>Malaysian Paediatric Surveillance Unit †</td>
<td>1994</td>
<td>7.7</td>
<td>395</td>
<td>75</td>
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<tr>
<td>Netherlands Paediatric Surveillance Unit</td>
<td>1992</td>
<td>3.0</td>
<td>692</td>
<td>0</td>
<td>70</td>
</tr>
<tr>
<td>New Zealand Paediatric Surveillance Unit</td>
<td>1997</td>
<td>0.8</td>
<td>208</td>
<td>94</td>
<td>n/a</td>
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<tr>
<td>Papua New Guinea Paediatric Surveillance Unit †</td>
<td>1996</td>
<td>2.0</td>
<td>40</td>
<td>79</td>
<td>n/a</td>
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<tr>
<td>Portuguese Paediatric Surveillance Unit</td>
<td>2001</td>
<td>1.4</td>
<td>1800</td>
<td>33</td>
<td>66</td>
</tr>
<tr>
<td>Swiss Paediatric Surveillance Unit</td>
<td>1994</td>
<td>1.3</td>
<td>38</td>
<td>100</td>
<td>98</td>
</tr>
<tr>
<td>Welsh Paediatric Surveillance Unit</td>
<td>1994</td>
<td>0.6</td>
<td>158</td>
<td>100</td>
<td>n/a</td>
</tr>
</tbody>
</table>

* Canadian Paediatric Surveillance Program paediatric population is aged 0-17.9 years
** 2004 Annual results
† Malaysian and Papua New Guinea Units have ceased surveillance

Acknowledging Contribution to Surveillance Studies
Paediatric surveillance units rely on the continued participation of paediatricians and other child health clinicians in the surveillance system. Their contribution is important and it should be encouraged and acknowledged in any publications that arise from surveillance studies. INoPSU recently published guidelines on acknowledging the important contribution of clinicians reporting cases to surveillance studies. They proposed the following recommendations in a letter in Archives of Disease in Childhood [1]:

- To qualify for authorship on publications, individuals must fulfil criteria set out in the Vancouver Protocol (www.icmje.org.au), and an acknowledgement of the clinicians contribution should also be included after the final author’s name, ie. “On behalf of contributors to the (national PSU)”
- Investigating teams are encouraged to consider inviting clinicians who have contributed significant data through case reports onto the study team to provide expertise relevant to the condition being studied and authorship may then be offered if appropriate under the Vancouver protocol.
- Individual clinicians reporting cases may be acknowledged by name in the acknowledgement section of the publication provided prior permission is sought for the clinician.

Public Health Impacts of Surveillance Studies
Studies conducted by paediatric surveillance units aim to have impact by effecting changes to public health policy, health resource allocation and clinical practice and ultimately improving child health. Collaboration among the INoPSU members has led to the simultaneous conduct of surveillance studies in different countries allowing for the international comparison of data and identification of geographical differences for conditions studied. Examples of studies conducted by units, and their impacts are summarised in Table 6. (2)

Reference:
<table>
<thead>
<tr>
<th>Study</th>
<th>Impact</th>
<th>Participating PSU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute flaccid paralysis</td>
<td>Confirmed absence of wild poliovirus and presence of vaccine-associated paralytic polio; contributed to WHO eradication and accreditation program.</td>
<td>APSU, BPSU, CPSP, NZPSU, SPSU</td>
</tr>
<tr>
<td><strong>Haemophilus influenzae</strong> type B infection</td>
<td>Documented success of Hib vaccination programs including combined pentavalent vaccine</td>
<td>APSU, ESPED, NSCK</td>
</tr>
<tr>
<td>Pertussis infection in infants</td>
<td>Informed changes to vaccination schedules; Identified need to review age of first vaccination and for targeted adult/adolescent vaccination.</td>
<td>APSU, BPSU, CGPSU, NSCK, NZPSU</td>
</tr>
<tr>
<td>Pneumococcal infection</td>
<td>Documented disease burden and supported universal vaccination programs.</td>
<td>ESPED, NZPSU</td>
</tr>
<tr>
<td>Congenital rubella syndrome (CRS)</td>
<td>Document persistence of CRS despite good vaccine coverage; and identify need for targeted vaccination for susceptible women (eg, immigrants, non-immune, pre-conception and postpartum).</td>
<td>APSU, BPSU, CPSP, NZPSU, SPSU, NSCK</td>
</tr>
<tr>
<td>Subacute sclerosing panencephalitis</td>
<td>Confirms disease is rare in countries with well implemented measles vaccination programs and is associated with wild measles virus infection.</td>
<td>APSU, BPSU, CPSP</td>
</tr>
<tr>
<td>Congenital Varicella; neonatal varicella; complications.</td>
<td>Supported need for universal vaccination; and education for community and health professionals regarding infection in pregnancy.</td>
<td>APSU, BPSU, CPSP</td>
</tr>
<tr>
<td>Neonatal herpes simplex virus infection</td>
<td>Confirms HSV-1 most prevalent in Australia and Canada; incidences is lower than in USA; disease is often severe. Identifies need for effective screening and development of vaccines both against HSV-1 &amp; 2.</td>
<td>APSU, BPSU, CPSP, SPSU</td>
</tr>
<tr>
<td>HIV/AIDS, perinatal exposure to HIV</td>
<td>Support recommendation for anti-retroviral agents, caesarian section, bottle feeding in infected mothers; supported recommendation for universal prenatal screening.</td>
<td>APSU, BPSU, LPSU, NSCK, NZPSU</td>
</tr>
<tr>
<td>Invasive group B streptococcal disease</td>
<td>National prevention guidelines recommended, either based on risk factors or through universal screening in late pregnancy.</td>
<td>BPSU, CPSP, ESPED, NSCK, PPSU</td>
</tr>
<tr>
<td>Progressive intellectual and neurological deterioration (PIND) and childhood dementia.</td>
<td>Identified variant CJD in Britain but not Canada and no trend to increased rate. Identified PIND has many aetiologies; many cases idiopathic; all highly demanding of health services.</td>
<td>APSU, BPSU, CPSP</td>
</tr>
<tr>
<td>Early onset eating disorder (&lt;13 years old)</td>
<td>Confirms need for pre-adolescent diagnostic criteria; substantial proportion of cases are boys aged ≤ 9years.</td>
<td>APSU, BPSU, CPSP, NSCK</td>
</tr>
<tr>
<td>Conversion disorder</td>
<td>First national study; described clinical features, disease burden, co-morbidity and risk of recurrence.</td>
<td>APSU</td>
</tr>
<tr>
<td>Munchausen syndrome by proxy</td>
<td>Identified large disease burden; feelings of isolation in clinicians; and need for multidisciplinary support for diagnosis and management.</td>
<td>APSU, BPSU</td>
</tr>
<tr>
<td>Rett Syndrome; Prader Willi Syndrome; Smith-Lemli Opitz Syndrome (SLOS)</td>
<td>Describe molecular epidemiology and genotype-phenotype correlations; establish research cohorts for longitudinal and other studies.</td>
<td>APSU, BPSU, CPSP</td>
</tr>
<tr>
<td>CHARGE association</td>
<td>Identified the complexity of CHARGE; overlap with other syndromes; need for future health resources plan; facilitated genetic studies.</td>
<td>APSU, CPSP</td>
</tr>
<tr>
<td>Medium chain acyl CoA dehydrogenase deficiency</td>
<td>Confirmed the value of neonatal tandem mass spectrometry screening for early identification of disease</td>
<td>BPSU, NSCK</td>
</tr>
<tr>
<td>Vitamin K deficiency bleeding</td>
<td>Confirms most cases are late onset and related to underlying liver disease; high proportion of cases receive none or incomplete prophylaxis.</td>
<td>APSU, BPSU, CPSP, ESPED, NZPSU, SPSU, NSCK</td>
</tr>
<tr>
<td>Fetal alcohol syndrome</td>
<td>Identified need for universal diagnostic criteria, specialised services, education of health professionals and the community, and prevention</td>
<td>APSU, NZPSU</td>
</tr>
<tr>
<td>Haemolytic uraemic syndrome</td>
<td>Described geographic variation in aetiology, highlighting the need for new diagnostic tests. Supported preventative measures eg education; hygiene recommendations for kindy farms; legislation regarding food production.</td>
<td>APSU, BPSU, CPSP, LPSU, NZPSU, PPSU, SPSU</td>
</tr>
<tr>
<td>Chemistry set poisoning</td>
<td>Resulted in amended legislation in the UK regarding packaging and provision of information</td>
<td>BPSU</td>
</tr>
<tr>
<td>Reye syndrome</td>
<td>Resulted in ban of aspirin in paediatric/youth populations</td>
<td>BPSU, ESPED</td>
</tr>
<tr>
<td>Baby walkers</td>
<td>Supported ban on sale, re-sale, advertisement and importation of baby walkers in Canada</td>
<td>CPSP</td>
</tr>
<tr>
<td>Lap-belt syndrome</td>
<td>Resulted in call for age- and size-appropriate use of restraints for children in motor vehicles</td>
<td>CPSP, APSU</td>
</tr>
</tbody>
</table>
INoPSU Conference 2006

Following the successful 3rd INoPSU meeting held in Lisbon, Portugal during 2004, a fourth meeting was held in London in May 2007 to coincide with the BPSU’s 20th Anniversary Conference. Representatives from the 12 active national units attended the meeting.

There were opportunities for networking and exchange of ideas and experiences of rare disease surveillance. Issues affecting most units included funding, the ethical approval of studies and the increasing need for data confidentiality. The morning session consisted of presentations from individual units. The Australian unit presented New Zealand and Australian data on Fetal Alcohol Syndrome. There was much interest in replicating the study by other units although concerns over case definition need to be addressed. The Canadian unit presented data on neonatal herpes and hyperbilirubinaemia. Talks on type 2 diabetes (Latvia), vitamin K deficiency bleeding (Netherlands) and acute flaccid paralysis (Switzerland) were also presented. On behalf of INoPSU the Australian Unit presented a paper on the public health impacts of surveillance studies. This paper has since been published in Archives of Disease in Childhood. At a business meeting in the afternoon, we discussed funding needs, the potential for international collaboration in developing studies and further development of the INoPSU website.

We look forward to the next meeting in Germany in 2008.

Representatives from the following national surveillance units attended the 4th INoPSU Conference, London:

Australian Paediatric Surveillance Unit
British Paediatric Surveillance Unit
Canadian Paediatric Surveillance Program
German Paediatric Surveillance Unit
Greece & Cyprus Paediatric Surveillance Unit
Irish Paediatric Surveillance Unit

Latvia Paediatric Surveillance Unit
Netherlands Paediatric Surveillance Unit
New Zealand Paediatric Surveillance Unit
Portuguese Paediatric Surveillance Unit
Swiss Paediatric Surveillance Unit
Welsh Paediatric Surveillance Unit
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**Policy Statements**

1. The Royal Australasian College of Physicians (RACP) and The Royal Australian and New Zealand College of Psychiatrists (RANZCP). Alcohol Policy: Using evidence for better outcomes. 2005 (E. Elliott, Committee Member).

**Reports that include APSU data**


Abstracts


Publications and Presentations 2005 - 2006


Presentations


18. Elliott EJ. Fetal alcohol syndrome in Australia: what we know and what we need to know. Fetal Alcohol Syndrome: diagnosis, epidemiology, behaviours and prevention. FAS Workshop, Children's Hospital at Westmead, May 2005.


25. Jones CA. Hepatitis C virus infection in Australian. 5th Update on HIV and Hepatitis Infection in children, Randwick, Sydney, 2005.


51. Rawlinson WD. Congenital CMV. Lectures to UNSW Science and Medicine Students in the Viruses and Disease Course, March and August 2005.

52. Rawlinson WD. Diagnosis of Viral Infection. University of NSW, School of Women’s and Children's Health Diploma of Paediatrics Lecture Program 2005.


55. Thorley B, Brussen KA, Stambos V, Kelly HA. The last case of wild poliovirus infection in Australia; a retrospective epidemiological and virological analysis. Communicable Disease Control Conference May 2005.


57. Thorley B, Brussen KA and Kelly H. How do we know we are polio free? 10th National Immunisation / 2nd PHAA Asia Pacific Vaccine Preventable Diseases Conference 2006.

**Community and Media Impacts**

1. Alcohol warnings for pregnant women. The Australian Dec. 18, 2006. (Interview with E. Elliott)


8. Maley J. To drink or not, for baby’s sake. Sydney Morning Herald Aug 8, 2005: 12-15. (Interview with E. Elliott)


13. Spencer F. Graphic alcohol labels flagged for mums-to-be. The West Australian 2006. (Interview with C. Bower)


**Workshops run by APSU**


Fetal Alcohol Syndrome (FAS) Workshop: Diagnosis, Epidemiology, Behaviours, and Prevention

This workshop was held on 5 May 2005 at The Children’s Hospital at Westmead and attracted an audience of over 100 clinicians, indigenous health workers, educators, researchers and interested policymakers. International speakers were Prof Ken Jones, who is credited as being the first to report FAS in the English literature, and Dr Christina Chambers, an epidemiologist with a special interest in the prevention of FAS, both from San Diego School of Medicine, California.

Australian speakers included Prof Carol Bower and Heather D’Antoine from the Telethon Institute for Child Health Research in Western Australia; Anne Russell, mother of two adult children with FAS, who represented the National Organisation for Fetal Alcohol Syndrome and Related Disorders; Lorian Hayes, an indigenous educator in Health Promotion, and Colleen O'Leary who is currently working in the Child & Community Health Directorate of the Western Australia Department of Health and Prof Elizabeth Elliott.

The workshop was exceptionally well rated and was featured in The Sydney Morning Herald newspaper the next day: “Professor Elliott said data suggested Australia had a low rate of the syndrome – less than one case per thousand live births in the general population, and between two and three cases per thousand in the indigenous population. But a lack of awareness of the syndrome among GPs and women and the reluctance of mothers to admit to alcohol use during pregnancy meant many cases were being missed.”

Rett Syndrome: Diagnosis, Genetics, Epidemiology, Clinical Management and the Parents Perspective

A two day workshop was held on 20 and 21 November 2005, at the Kerry Packer Institute for Child Health Research, The Children’s Hospital at Westmead. The workshop was a joint venture between the APSU, the Telethon Institute for Child Health Research and the Rett Association. The first day was for parents and carers of children with Rett Syndrome and provided an opportunity for parents to network while having access to clinicians and researchers working in the area. This was also a valuable opportunity for clinicians to hear firsthand experiences about living with, and caring for, a child with Rett syndrome. Approximately 80 parents, carers and educationalists from around Australia attended.

Presentations on the second day were aimed at health professionals. The audience was multidisciplinary and included nurses, therapists, a special education teacher, senior consultants and other clinicians, researchers, dieticians, a genetics counsellor, and some parents and carers. The workshop highlighted the latest advances in clinical and genetic diagnosis and the need for a multidisciplinary approach to the care of children with Rett syndrome. Improved linkage of researchers through the “InterRett” study has enabled the development and comparison of cohorts internationally. Crystal Laurvick showed results from a study of the psychosocial impacts on families and communities, and this was echoed by two heartfelt presentations from parents. All presentations rated very highly and all who attended reported increased knowledge of Rett syndrome after the workshop. Guest Speakers included: Dr Helen Leonard, Professor John Christodoulou, Dr Gordon Baikie and Ms Crystal Laurvick. Materials related to the workshop are available from the APSU website www.apsu.org.au.
Recipients of the wine prize draw highlighted

ACT
Dr Ann Crawshaw
A Prof G David Croaker
Dr Alison Kent
Dr Anthony Lafferty
Dr Grant A Mackenzie
Dr Suzanna Powell

Dr Michael Falk
Dr Judith L Bragg

NSW
Dr Susan Adams
Dr Geoff Amblor
Dr Ian Andrews
Dr Elizabeth Argent
Dr Andrew Berry
Dr Paul Bloomfield
Dr Christopher Blyth
Dr Jennifer R Bowen
Dr Adam Campbell
Dr Paul Chidiac
Dr Des Cohen
Dr Richard J Cohn
Dr Heather Coughtry
Dr Maria Craig
Dr Paul Craven
Dr Patricia Crock
Dr Clare A Cunningham
Dr P Davidson
Dr John A De Courcy
Dr Mark De Souza
Dr Kim Donaghe
Dr Peter E Doyle
Dr Matthew J Edwards
Dr Carolyn J Ellaway
Dr Phillip J Emder
Dr Adrienne G Epps
Dr John B Erikson
Dr Elizabeth R Fagan
Dr Michael Fanner
Dr Dominic A Fitzgerald
Dr Stuart M Gadd
Dr Deepak Gill
Dr Safak Goktogan
Dr P M Goodhew
Dr Sandra P Gray
Dr P Grattan-Smith
Dr Anne Hackett
Dr Maxwell Hopp
Dr Keith M Howard
Dr Neville J Howard
A Prof David Isaacs
Dr Stephen Jacob
A Prof Cheryl A Jones
Dr Alyson M Kakakios
Dr Stewart J Kellie
Dr Allan M G Kerrigan
Dr Alison M Kessson
Dr Jan Klimek

Dr Martin R Kluckow
Dr Paul W Knight
Dr Phillip Kolos
Mr Erik La Hei
Dr John A Lawson
Dr A S C Lim
Dr Melissa C Luig
Dr Sloane Madden
Dr Albert Mansour
Dr Susan M Marks
Dr Glenn M Marshall
Dr Hugh C O Martin
Dr C R McIlwain
Dr David W McDonald
Professor Peter B McIntyre
Dr Fiona McKenzie
Dr Tracey Merriman
Dr Joseph P Moloney
Dr P Palasanthiran
Dr P Patradoon-Ho
Dr Susan Piper
Dr Suzanna Powell
Dr J S Preddy
Dr Laurence G Roddick
Dr Susan J Russell
Dr Charles M Scarf
Dr John K H Sinn
Dr Robert Smith
Dr Jacqueline A Stack
Dr David R Starte
Dr Glenn Stephens
Dr Lee Sutton
Dr Juliana T K Teo
Dr Anne M Turner
Dr Peter Van Asperen
Dr J L Walker
Dr Mary-Clare Waugh
Dr Boyd Webster
Dr Meredith Wilson
Dr Catherine Wilshire
Dr Ian Wright
A Prof John Ziegler

Dr Timothy J Donovan
Dr Aaron M Eastberk
Dr Bruce Goodwin
Dr Leonie M Gray
Dr Wayne A Harris
Dr G J Harte
Dr E M Hutton
Dr J Anne Kynaston
Dr Helen Liley
Dr Elena J Mantz
Dr John R McCleanor
Dr David B McCrossin
Dr Julie McEniery
Dr Susan Moloney
Dr David J Moore
Dr Clare Nourse
Dr Jose A Prado
Dr Ian F Robertson
Dr Patrick J Ryan
Dr Phil Sargent
Dr A J Slater
Dr M Slawowski
Dr Mark Stretton
Dr David I Tudehope
Dr Claire E Wainwright
Dr Timothy H Warnock
Dr Michael L Williams
Dr Nicholas F Woolfchild

SA
Dr Christopher Barnett
Dr Janice M Fairchild
Mr W D A Ford
Dr Paul M Goldwater
Dr Ross R Haslam
Dr Simon L James
Dr Christopher M Lunt
Dr Richard G Power
Dr Nicola J Spurnier
Prof Hock-Lim Tan
Dr M W Yung

Dr Jennifer E Ault
Dr E Simpson

NSW
Dr E Simpson

Clinicians Reporting Cases in 2005

Recipients of the wine prize draw highlighted

ACT
Dr Amelia M Herath
Dr Ian W Hutton
Dr Paul J Jenkins
Dr Penelope J Johnson
Dr Alison Kent
Dr Antony Lafferty
Dr Suzanne M Packer

Dr Michael Falk
Dr Judith L Bragg

Dr E Simpson

NSW
Dr Jennifer E Ault
Clinicians returning 100% of cards in 2005

SA

Dr Phillip Adams
Dr George P Blake
Dr R Burnell
Dr Brian Copin
Dr Richard T L Couper
Dr Terence G Donald
Dr Philip R Egan
Dr Janice M Fletcher
Prof Kevin D Forsyth
Dr Andrew W Grieve
Dr Eric A Haan
Dr T T S Han
Dr Michael G Harbord
Dr Paul H Henning
Dr Anthony M Hoby
Dr Anthony R Israel
Dr Kenneth F Jureidini
Dr Jon Jureidini
Dr J D Kennedy
Dr David B Ketteridge
Dr Maria Kirby
Dr Margaret Anne
Kummerow
Dr Margaret R Kyrkou
Dr M A Measday
Dr Josie Nozza
Dr Peter A Petek
Dr Robert P Pollnitza
Dr Terence S Pouras
Dr Richard G Power
Dr Michael S Rice
Dr Malcolm Richardson
Prof Don M Robertson
Dr Remo (Ray) N Russo
Dr Michael J Smiley
Mr Anthony sparrow
Dr Gregory J Smith
Dr Rima E M Stauagas
Dr Nigel L Stewart
Professor Hock-Lim Tan
Dr Ram Suppiah
Dr Billy S Tao
Dr Heather Tapp
Dr Andrew J Tidemann
Dr Deirdre A White

TAS

Dr Dr Christopher J Bailey
A Prof K L Armstrong
Prof Allan Carmichael
Dr Patrick M T Fernando
Dr Peter J Fetti
Dr Elizabeth Hallam
Dr Mark M Pascoe
Dr A W Shugg
Dr Ian G Stewart

VIC

Dr Dr Roger C Allen
Dr Katie J Allen
Dr Stuart G Anderson
Mr Alexander W Auldist
Dr Gordon Bailke
Dr Erver Bajraszewski
Dr David G Bannister
Professor Graeme Barnes
Dr Noel Mcg Bennett
Dr Simon P Blair
Dr Fiona D Brown
Dr Fergus J Cameron
Dr William D Capell
Dr Bronwyn A Cathels
Dr C Chandran
Dr Jacinta M Coleman
Dr S Costello
Dr John M Court
Dr A J Daley
Dr Margot J Davey
Dr Peter Davis
Dr Noni M Davis
Dr Martin B Delatycki
Dr P Dewan
Dr Peter S Dewez
Dr Peter Andrew Downie
Dr David C Downing
A Prof Lex William Doyle
Dr John Hedley Drew
Dr Kevin Bernard Dunne
Dr Peter James Eastaugh
Dr Daryl Efron
Dr James Elder
Dr Adrian M Elderhurst
Dr Bronwyn M Francis
Dr Peter D Francis
Dr Simon Fraser
Dr Jeremy L Freeman
A Prof Paul D FULLerton
Dr Robert J M Gardner
Dr Danny E Garrick
Dr Susan Gibb
Dr Hugo Gold
Dr Peter W Goss
Dr Desmond H Guppy
Dr Dennis Hain
Dr C Hamilton
Dr Richard Haslam
Dr Sari Hayllar
Dr Michael Hayman

Dr Ralf Heine
Dr Peter H Hewson
Dr David J Hill
Dr Harriet Hiscock
Dr Nigel W J Hocking
Dr Geoffrey G Hogg
Dr James Holberton
Dr Alexander M Hopper
Dr Robyn L Hore
Dr Sian M C Hughes
Dr Rod W Hunt
Dr David J James
Dr Frederick C Jarman
Dr Bernard M Jenner
Dr Diana Lynne Johnston
Dr Lilian Johnstone
Mr Justin H Kelly
Dr Hugh Kelso
Dr Susan Kermond
A Dr Richard Kitching
Dr Annette Knoches
Dr A J Kombberg
Dr Anthony Lewis
Dr Catherine Lynch
Dr Leslie J Markman
Dr R John H Massie
Dr Catherine Mcadam
Dr David A McCreadie
Mr D McLaren
Dr James A McLellan
Dr Elizabeth McLeod
Dr Kathryn McMahan
Mr Neil D Mcmullin
Dr R B McNeill
Prof Samuel Menahem
Dr Margot Nash
Dr M J Nowotny
Prof Frank Oberklaid
Dr M R Oliver
Dr Greg M Pallas
Dr Chris Pappas
Dr Julian H Paxton
Dr V A Pearse
Dr Susan Randle
Dr I D Rawlinson
A Prof D S Reddithough
A Prof Colin F Robertson
Dr Sheryle Rogerson
Dr Margaret Rowell
Dr R Neil D Roy
Dr Monique Ryan
Dr Luke P Sammartino
Dr Christine Sanderson
Dr Keryn Reynolds
Dr R Savarrayan

Prof Susan Sawyer
A Ingrid E Scheffer
Dr Jill R Sewell
Dr Lloyd K Shield
Dr Ian J Skelton
Dr Arnold L Smith
Dr Lindsay J Smith
Dr Christopher Smith
Dr Jennifer A S Smith
Dr John C Spensley
Dr Michael J Stewart

Dr T G Stubberfield
Dr Mimi Tang
Dr Russell G Taylor
Dr Nick H Thies
Dr Karin Tiedemann
Dr David Gerald Tingay
Dr Jacinta M Tobin
Dr Sophie C Treleaven
Dr Keith D Waters
Dr Peter W Wearne
Dr Annette N Webb
Dr Robert G Weintraub
Dr Anthony P Weldon
Prof George Werther
Dr Susan White
Mr S F Wickramasinghe
Dr James L Wilkinson
Dr Harry Zehnwirth

WA

Dr A J Alessandri
Dr David L Baker
Dr David P Burgner
Dr Lynda Chadwick
Dr Gervase M Chaney
Dr Peter J L Chauvel
Dr Richard J Christie
Dr Hock Leng Chua
Dr Harvey L C Coates AO
Dr Harry Dumbell
Dr Ian James Everitt
Dr Annette M Finn
Dr Philomena Fitzgerald
Dr Noel P French
Dr Anna Gubbay
Dr Richard Hill
Dr Michelle Howell
Dr Lawrence T H Hu
Dr Kay H Johnston
Clin A Prof T W Jones
Dr C Kikiros
Dr Geoffrey J Knight
Dr Rolland Kohan
Dr Helen Leonard
Dr Jane Mary Lesslie
Dr Dominic Mellon
Dr Cherry Martin
Dr Judy E McMichael
Dr Helen J Mead
Dr Corrado Minutillo
Dr Lakshmi Nagarajan
Dr Mark Parker
Dr Marianne Phillips
A Prof Susan L Prescott
Dr P C Richmond
Dr David E Roberts
Prof Karen N Simmer
Dr M Slattery
Dr Jennie Slew
Dr Russell G Troedson
Dr Jack B Vercoe
Dr A Wilkins-Shumer
Dr Frank Willis

51
Recipients of the wine prize draw highlighted

ACT
Dr Ann Crawshaw
Dr Ian F Crawshaw
A/Prof G David Croaker
Dr Ian W Huffin
Dr Paul I Jenkins
Dr Alison Kent
Dr Anthony Lafferty
Dr Timothy McDonald
Dr Suzanna Powell
A/Prof Graham J Reynolds
Dr Michael J Rosier

NSW
Dr Susan Adams
Dr Stephen Alexander
A/Prof Geoff Ambler
Dr Rosemary Ambler
Dr Alan F Armos
Dr Donald G Anderson
Dr Elizabeth Argent
Dr John D Arnold
Dr Nadia Badawi
Dr Yvonne Belessis
Dr Graham Bench
Dr G P Bent
Dr Andrew Berry
Dr Christopher Blyth
Dr Rosemary E Fahy
Dr John A De Courcy
Dr Robert Davies
Dr P Davidson
Dr Robert Davies
Dr John A De Courcy
Mr Anthony Dilley
Dr Peter Ernest Doyle
Dr Scott Dunlop
Prof Elizabeth J Elliott
Dr Phillip John Emder
Dr Adrienne G Epps
Dr Anthony D Epstein
Dr Paul Evrard
Ms Fiona Fahy
A/Prof D A Fitzgerald
Dr Bob K J Fonseca
Dr P M Goodhew
Dr Padraic Grattan-Smith
Dr Toby D R Greenacre
Dr Katherine Hale
Dr Robert J Halliday
Dr Robert J Hardwick
Dr Richard K Hart
Dr John G Harvey
Dr Maxwell Hopp
Dr Keith M Howard
Prof David Isaacs
Dr A Prof Cheryl Anne Jones
Prof Peter Dominic Jones
Dr Hala Kafk
A/Prof Alison M Kessoon
A/Prof Henry A Kilham
Dr Jan Klimek
Mr Erik La Hei
Dr John A Lawson
Dr Joanne Leal
Dr Ian D Lennon
Dr A S C Lim
Dr Daniel C S Lim
Dr Alison Loughran-Fowlds
Dr Kristine Macartney
Dr Rajesh Maheshwar
Dr Albert Mansour
Dr Hugh C O Martin
Dr Mary Mccaskill
Dr Geoffrey McCowage
Dr Tim Mcrossin
Dr David T McDonald
Dr Patricia McVaeagh
Dr Tracey Merriman
Dr Patrick J Moore
Dr David R Mowat
Dr Desmond L Mulcahy
Dr Craig Munns
Dr Patricia E Mutton
Dr Anandhan P Naidoo
Dr A/Prof David A Osborn
Prof Robert A Ouvrier
Dr Pamela Palasanthiran
Dr Con Papadopoulos
Dr Julianne Parle
Dr Patrick Patradoon-Ho
Dr Elizabeth Peadon
Dr Elizabeth Pickford
Dr Christopher C Poon
Dr Keith M Power
A/Prof Peter G Procopis
Ms Kerry Quinn
Prof William Rawlinson
A/Prof A R Rosenberg
Dr Greg Rowell
Dr David N Schell
Dr Vijay Shingde
Prof Martin Silink
Dr Jacqueline E Small
Dr Peter Smith
Dr David R Starte
Dr Michael Stormon
Dr Lee Sutton
Dr Paul R Tait
Dr Rodney L Tobiarnsky
Dr Toby Tchahar
Dr Anne M Turner
Dr Dimitra Tzioumi
Dr Mary-Claire Waugh
Dr Boyd Webster
Dr Richard Webster
Dr Bridget Wilcken
Dr C R Wiles-Harrell
Dr Catherine Willshire
Dr Nicholas Wood
Dr Helen Woodhead
Dr Lisa Catherine Worgon
Dr Barry E Wyeth
Dr Kyle Meredith Yates
A/Prof John B Ziegler

NT
Dr Rosemary E Fahy
Dr Robert Roseby

QLD
Dr Donald B Adsett
Dr Donald B Appleton
Dr Erica Baer
Dr Deborah Bailey
Dr Ruth Barker
Prof Jennifer A Batch
Dr Richard P B Brown
Dr Gregory I Carman
Dr David W Cartwright
Dr Richard E Cherry
Dr Kelvin Choo
Dr Ronald C Clark
Dr John Coghlan
Dr Lucy Helen Cooke
Dr Andrew Cotterill
Dr Maree G Crawford
Dr J A Cullen
Dr Alison Cupitt
Dr Mark W Davies
Dr Peter J DeBuse
Dr R D Diplock
Dr Timothy John Donovan
Dr Aaron M Eastbrook
Dr Michael R Gattas
Dr Kate Gibson
Dr Bruce Goodwin
Dr G J Harte
Dr E M Hurrion
Dr Susan Ireland
Dr J A Kynaston
Dr Helen Liley
Dr Bruce G Lister
Dr Julie McEniery
Dr Robert A L McGregor
Dr David McMaster
Dr Hilary P Mercer
Dr Ross D Messer
Dr Ryan Mills
Dr Susan Moloney
Dr Anthony Morosini
Dr Brian D Morris
Dr Clare Nourse
Dr Tat-Hin Ong
Dr Julie Panetta
Dr David R Pincus
Dr Jose A Prado
Dr Ian F Robertson
Dr Christopher J Ryan
A/Professor Alan A Sive
Dr H Statelewski
Dr Felix K Y Tan
Dr Fiona Thomson

SA
Dr Christopher Barnett
Dr David A Boulderstone
Dr R Burnell
Dr Brian Coppin
Dr Philip R Egan
Dr Janice M Fletcher
Mr W D A Ford
Dr Paul N Goldwater
Dr Annie Whybourne
Dr Paul Hammond
Dr Bevan Headley
Dr Paul H Henning
Dr Malcolm A Higgins
Dr David B Kettridge
Dr Kathy Lee
Dr D M Lawrence
Dr Andrew J McPhee
Dr M A Meadsday
Dr Scott Morris
Dr Terence S Pouras
Dr Jeremy Rafios
Dr Jacqueline Kaye Schutz
Dr Gregory J Smith
Dr Heather Tapp

TAS
Dr Christopher J Bailey
Dr Sean Beggs
A/Prof John Daubenton
Dr Peter J Field
Dr Mark M Pascoe
Dr Margaret M Phelan
Dr A W Shugg
Dr David Strong

VIC
Dr Roger C Allen
Dr Kym P Anderson
Dr Stuart G Anderson
Dr Peter L J Barnett
Dr Penelope H Bolt
Dr Justin Brown
Dr Jim Buttery
A/Prof D J S Cameron
Dr William D Capell
Dr Bronwyn A Cathles
Dr Tracy Coleman
Dr Kevin J Collins
Dr Nigel Curtis
Dr David A Coghill
Dr Peter S Deweze
Prof Richard R Doherty
Dr John Hedley Drew
Dr Peter James Eastaugh
Dr Adrian M Metherhurst
Dr Wei Qi Fan
Dr Wolf-Christian Fiedler
Dr Peter J Forrest
Dr Jolene M Fraser
Dr Paul N Goldwater
Dr Jeremy L Freeman
Dr David Fuller
Dr Vanessa Gabriel
Dr Danny E Garrick
Dr Hugo Gold
Dr Anton G M Harding
Dr Simon Harvey
Dr Simon Hauser
Dr Sari Haylir
Dr Nigel J W Hocking
Dr James Helbrom
Dr Susan E Jacobs
Dr Bernard M Jenner
Dr Diana Lynne Johnston
Dr Hugh Kelso
Dr S Khosrowpanah
Dr Teresa Lazaro
Dr Robert F Lim
Dr Edwin J Lowther
Dr Lesley J Markman

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Clinicians Reporting Cases in 2006

Recipients of the wine prize draw highlighted

ACT
Dr Judith L Bragg
Dr Ian F Crawshaw
Dr Ann Crawford
A Prof G David Croaker
Dr Michael Falk
Dr Amelia M Herath
Dr Hilary A Holmes
Dr Ian W Hufton
Dr Paul J Jenkins
Dr Penelope J Johnson
Dr Zsuzsoka Kecskes
Dr Alison Kent
Dr Antony Lafferty
Dr G Malecky
Dr Timothy McDonald
Dr Suzanne M Packer
A Prof Graham J Reynolds
Dr Michael J Rosier
Dr Erroll Simpson
[Further names listed]

NSW
Dr C Abkiewicz
Dr Susan Adams
Dr Julie C Aisworth
Dr Lesley C Ades
Dr Ion S Alexander
Dr Stephen Alexander
Dr Hugh D W Allen
Dr Garth Alperstein
A Prof Geoff Ambler
Dr RosemaryAmbler
Dr Alan F Amos
Dr Donald G Anderson
Dr Michael Aniscombe
Dr Jayne H Antony
Dr John D Arnold
Dr Jennifer E Ault
Dr Nadia Badawi
Dr Lynn Banna
Dr Peter A Barr
Dr Karl Baumgart
Prof Louise A Baur
Dr Vivian V Bayl
Dr Philip J Beeby
Dr Graham J Bench
A Prof David L Bennett
Dr G P Bent
Dr Jennifer Berg
Dr Mary E Bergin
Dr Andrew Berry
[Further names listed]

WA
Dr Robert A Sloane
Prof Mike South
Dr Mike Starr
Mr Keith B Stokes
Dr Terry G Stubberfield
Mr Robert Stundon
Dr Russell G Taylor
Dr Anne-Marie Turner
Dr Andrew M C Watkins
Mr S F Wickramasinghe
Dr Margaret Zacharin
Dr Harry Zenwirth
Dr Martin Berry
Dr Roger Blackmore
Dr Paul Bloomfield
Dr Christopher Blyth
Dr Srinivas Bollisetty
Dr Jennifer R Bowen
Dr J B Bretenet
Dr Kerry Brown
Dr Gary Browne
Dr M P Brydon
Dr Adam Buckmaster
Dr P Buckner
Dr Laurence E Budd
Dr Donald L Butler
Dr Anne M E Bye
Dr P Ha Yuen Caldwell
Dr Ian Callander
Dr Peter J Campbell
Dr Dianne Campbell
Dr Thomas A Campbell
Dr Jeffrey Chaitow
Dr Kitty Chee
Dr Paul Chidiac
Dr Howard W Chilton
Dr Raymond Chin
Dr Alan Y H Chong
Dr Robin X C Choong
Dr David Christie
Prof John Christodoulou
Dr Simon D Clarke
Dr John C Coakley
Dr Ralph C Cohen
Dr Des Cohen
Dr Richard J Cohn
Dr Michael J Cole
Dr Felicity A Collins
Dr Patrick E Connanlon
Dr J R Coomarasamy
Dr Peter John Cooper
Dr Stephen G Cooper
Dr Carolyn Cooper
Dr Michael C Copeman
Dr Heath Coughtry
Dr Christopher T Cowell
Dr Jonathon Craig
Dr Maria Craig
Dr Paul Craven
Dr Geoffrey J Crawford
Dr Patricia Crock
Dr Genevieve E Cummins
Dr Shane Curran
Dr Bruce Currie
Dr Julie A Curtin
Dr Luce Dalla-Pozza
Dr P Davidson
Dr Robert Day
Dr Andrew Day
Dr John A De Courcey
Dr Mark D Derussen
Dr Michael J Deloughery
Dr Kim Donaghe
Dr Peter John Donald
Dr Stuart F A Donney
Dr Ana Maria Dosen
Dr David Dossetor
Dr Peter Ernest Doyle
Dr Barry John Duffy
Dr Richard John Dunstan
Dr Linda Duroyage
Dr Peter William Ebeling
Dr Matthew J Edwards
Dr Carolyn Jane Ellaway
Prof Elizabeth J Elliott
Dr Phillip John Emder
Dr Adrienne G Epps
Dr Anthony D Epstein
Dr John B Erikson
Dr Nick Evans
Dr Elizabeth R Fagan
Dr Michael J Fairley
Dr Robert H Farnsworth
Dr Michael Fasher
Dr John Feller
Dr Penelope Field
A Prof D A Fitzgerald
Dr Fiona Fleming
Dr Bob B J Fonseca
Dr Michael R Freelander
Dr Stuart M Gadd
Dr Andrew J Gardiner
Dr P A Garvey
Prof Kevin J Gaskin
Dr Madlen Gazarian
Dr Maurice D Gett
Dr Thomas A Gilroy
Dr Anna Clare Gill
A Prof Jonathan Gillis
Dr Neil D Ginsberg
Dr Anne F Glanville
Dr Rebecca Glover
Dr Chin Lum Goh
Dr Safak Goctogan
Dr Maria Linette Gomes
Dr P M Goodhew
Dr T M Grattan-Smith
Dr Padraic Grattan-Smith
Dr Kay H Johnston
Clin A Prof T W Jones
Dr Bradley Jongeling
Dr Anne F Kehoe
Dr Helen J Mead
Dr Lakshmi Nagarajan
Dr Flemming H Nielsen
Dr P C Richmond
Dr Jacqueline M Sculfor
Dr Mary J Shinn
Dr Peter J Silberstein
Dr M Slattery
Dr Stephen Stick
Dr Jack B Vercoe
Dr A Wilkins-Shurmer

Clinicians returning 100% of monthly cards in 2006

Dr Lloyd K Shield
Dr Robert A Sloane
Prof Mike South
Dr Mike Starr
Mr Keith B Stokes
Dr Terry G Stubberfield
Mr Robert Stundon
Dr Russell G Taylor
Dr Anne-Marie Turner
Dr Andrew M C Watkins
Mr S F Wickramasinghe
Dr Margaret Zacharin
Dr Harry Zenwirth
Dr Luce Dalla-Pozza
Dr P Davidson
Dr Robert Day
Dr Andrew Day
Dr John A De Courcey
Dr Mark D Derussen
Dr Michael J Deloughery
Dr Kim Donaghe
Dr Peter John Donald
Dr Stuart F A Donney
Dr Ana Maria Dosen
Dr David Dossetor
Dr Peter Ernest Doyle
Dr Barry John Duffy
Dr Richard John Dunstan
Dr Linda Duroyage
Dr Peter William Ebeling
Dr Matthew J Edwards
Dr Carolyn Jane Ellaway
Prof Elizabeth J Elliott
Dr Phillip John Emder
Dr Adrienne G Epps
Dr Anthony D Epstein
Dr John B Erikson
Dr Nick Evans
Dr Elizabeth R Fagan
Dr Michael J Fairley
Dr Robert H Farnsworth
Dr Michael Fasher
Dr John Feller
Dr Penelope Field
A Prof D A Fitzgerald
Dr Fiona Fleming
Dr Bob B J Fonseca
Dr Michael R Freelander
Dr Stuart M Gadd
Dr Andrew J Gardiner
Dr P A Garvey
Prof Kevin J Gaskin
Dr Madlen Gazarian
Dr Maurice D Gett
Dr Thomas A Gilroy
Dr Anna Clare Gill
A Prof Jonathan Gillis
Dr Neil D Ginsberg
Dr Anne F Glanville
Dr Rebecca Glover
Dr Chin Lum Goh
Dr Safak Goctogan
Dr Maria Linette Gomes
Dr P M Goodhew
Dr T M Grattan-Smith
Dr Padraic Grattan-Smith
Dr Kay H Johnston
Clin A Prof T W Jones
Dr Bradley Jongeling
Dr Anne F Kehoe
Dr Helen J Mead
Dr Lakshmi Nagarajan
Dr Flemming H Nielsen
Dr P C Richmond
Dr Jacqueline M Sculfor
Dr Mary J Shinn
Dr Peter J Silberstein
Dr M Slattery
Dr Stephen Stick
Dr Jack B Vercoe
Dr A Wilkins-Shurmer
Clinicians returning 100% of monthly cards in 2006

SA
- Dr K Abbott
- Dr Phillip Adams
- Dr Christopher Barnett
- Dr George P Blake
- Dr Hilary Boucaut
- Dr Yumin Chan
- Dr Richard A Cockington
- Dr Brian Coppin

Dr David G Corlis
Dr Richard T L Couper
A Prof Jenny Couper
A Prof G P Davidson
Dr Philip R Egan
Dr David S Everett
Mr W D A Ford
Prof Kevin D Forsyth
Dr Michael G Harbord
Dr Paul H Henning
Dr Malcolm A Higgins
Dr David J S Hill
Dr Anthony R Israel
Dr Judith A Jaensch
Dr Kenneth P Jureidini
Dr Jon Jureidini
Dr J D Kennedy
Dr David B Ketteridge
Dr Maria Kirby
Dr Margaret A Kummerow
Dr Margaret R Kyrkou
Dr Christopher M Lamb
Dr Paul Lang
Dr Peter Marshall
Dr A James Martin
Dr Andrew J McPhee
Dr David J Moore
Dr P S Munt
Dr Christopher M Pearce
Dr Peter A Petek
Dr Robert P Pollinitz
Dr Nicola K Plopawski
Dr Terence S Pouras
Dr Richard G Power
Dr Jeremy Rafts
Dr Nicholas Ricci
Dr Michael S Rice
Dr Brett Kingsley Ritchie
Dr Terence P Robertson
Dr Remo (Ray) N Russo
Dr A Sabato
Dr Michael J Smiley
Dr Gregory J Smith
Mr Anthony Spermon
Dr Rima E M Stausgas
Dr Nigel L Stewart
Dr Ram Suppiah
Prof Hook-Lim Tan
Dr Billy S Tao
Dr Heather Tapp
Dr Mark A Theisinger
Dr David G Thomas
Dr Andrew J Tidemann
Dr Deirdre A White

Dr Christopher J Bailey
Prof Allan Carmichael
Dr Anthony J Dunstan
Dr Edmond J M Fenton
Dr Patrick M T Fernando
Dr Peter J Fleet
Dr Evelyn Funk-Bowes
Dr Elizabeth Hallam
Dr/Valerie M Hewitt
Dr David G McDonagh
Dr S J Parsons
Dr Mark M Pascoe
Dr Margaret M Phelan
Dr A W Shugart
Dr Ian G Stewart
Dr Michelle Williams

VIC
- Dr Roger C Allen
- Dr David Amor
- Dr Stuart G Anderson
- Dr Ylva Anderson
- A Prof K L Armstrong
- Dr David S Armstrong
- Mr Alexander W Auldist
- Dr Gordon Baille
- Dr David G Bannister
- Dr Charles Barfield
- Dr Philip B Bergman
- Dr Julie E Bines
- Dr John M Bishop
- Dr Simon P Blair
- Dr Avithu Boneh
- Dr Fiona D Brown
- Dr A Douglas Bryan
- Dr Jim Buttery
- A Prof D J S Cameron
- Dr Fergus J Cameron
- Dr William D Capell
- Dr David J Carolane
- Dr Elizabeth A Carse
- Dr Bronwyn A Cathels
- A Prof A G Catto-Smith
- Dr C Chandran
- Dr Peter G Churven
- Dr Tracy Coleman
- Dr Jacinta M Coleman
- Dr Kevin J Collins
- Dr S Costello
- Dr John M Court
- Dr Noel E Cranwick
- Dr Nigel Curtis
- Dr David A Cutting
- Dr A J Daley
- Dr Margaret H Danchin
- Dr Anita Lucia D’Aprano
- Dr Margot J Davey
- Dr Peter Davis
- Dr Noni M Davis
- Dr Martin B Delatycki
- Prof Paddy Dewan
- Dr Peter S Dewez
- Dr Peter Andrew Downie
- Dr David C Downing
- A Prof Lex William Doyle
- Dr John Hedley Drew
- Dr Karen Leslie Dunn
- Dr Kevin Bernard Dunne
- Dr Peter James Eastaugh
- Dr Maurice Kelvin Easton
- Dr Daryl Efron
- Dr James Elder
- Dr Adrian M Elderhurst
- Dr Michael Fahey
- Dr Colin J Feekery
- Dr Wolf- Christian Fieder
- Dr Lance V Fong
- Dr Geoffrey W Ford
- Dr Peter J Forrest
- Dr Bronwyn M Francis
- Dr Peter D Francis
- Dr Simon Fraser
- Dr Jeremy L Freeman
- A Prof Nicholas J Freezer

Dr Vanessa Gabriel
Dr Danny E Garrick
Dr Susan Gibb
Dr Tiow-Hoe Goh
Dr Hugo Gold
Dr Peter W Goss
Dr Philip J Graves
Dr Desmond H Guppy
Dr Dennis Hain
Dr C Hamilton
Dr Michael D Harari
Dr Winita Hardikar
Dr Anton G M Harding
Dr Richard Haslam
Dr Simon Hauser
Dr Sari Heavir
Dr Michael Hayman
Dr Ralf Heine
Dr Robert D Henning
A Prof Peter H Hewson
Dr David J Hill
Dr Harriett Hiscock
Dr Nigel W J Hocking
Dr Geoffrey G Hogg
Dr James Holberton
Dr Robyn L Hone
Dr Ian E Humphrey
Dr Rod W Hunt
Dr John G Hunter
Dr Susan E Jacobs
Dr Frederick F Jarman
Dr Bernard M Jenner
Dr David L Johnson
Dr Diana Lynne Johnston
Dr Lillian Johnstone
Dr Colin Lindsay Jones
Mr Justin H Kelly
Dr Hugh Kelso
Dr Andrew D Kennedy
Dr S Khosrowpanah
Dr A Richard Kitching
Dr Annette Knoches
Dr A J Kornberg
Dr David Krierer
Dr Thomas J Lee
Dr Anthony Lewis
Dr Robert F Lister
Dr Edwin J Lowther
Dr Lionel Lubitz
Dr Catherine Lynch
Dr Mark T Mackay
Dr Leslie J Markby
Dr Michael K Marks
Dr Catherine Marraffa
Dr R John H Massie
Dr Brendan McCann
Dr David A McCreight
Dr Joanna McCluskin
Dr Peter N McDougall
Dr James A McLellan
Dr Elizabeth McLeod
Dr Kathy McMahon
Mr Neil D McLennan
Dr R B McNeill

Dr Joseph Mel
Prof Samuel Menahem
Dr John F Mills
A Prof P T Monagle
Prof Colin Morley
Dr Anne L Moulden
Dr Kenneth M Mounfield
Dr Jane Munro
Dr Margaret Nash
Prof Terence M Nolan
Dr M J Nowotny
Prof Frank Oberklaed
Clinicians returning 100% of monthly cards in 2006

Dr M R Oliver  Dr Ian J Skelton  Dr Geoffrey J Knight
Dr Anne O'Neill  Dr Susan Skull  Dr Rolland Kohan
Dr Gillian Opie  Dr E Smibert  Dr Alpana Kulkarni
Dr Greg M Pallas  Dr Lindsay J Smith  Dr Hemant Anant Kulkarni
Dr Chris Pappas  Dr Christopher Smith  Dr Kishore Kumar
A Prof Campbell Paul  Dr Jennifer A Smith  Dr Jane Mary Lesslie
Dr Julian H Paxton  Dr Arnold L Smith  Dr Cherry Martin
Dr V A Pearse  Dr Andrea Smith  Dr Judy E McMichael
Dr Roderic J Phillips  Prof Mike South  Dr Helen J Mead
Dr Anisha Pillay  Dr John C Spensley  Dr Catherine F Mews
Dr Harley R Powell  Dr Michael J Stewart  Dr Ashanthi Munasinghe
Dr Jenny Proimos  Dr Terry G Sterberfield  Dr Lakshmi Nagarajan
Dr Sarath Ranganathan  Mr Robert Studden  Dr Rama Naidoo
Dr I D Rawlinson  Dr Joseph Tam  Dr Mark Parker
A Prof D S Reddighough  Dr Mimi Tang  Dr Sanjay Patole
Dr Gehan Roberts  Dr Nick H Thies  Dr Bronwyn Peirce
Dr Philip James Robinson  Dr Karin Tiedemann  Dr Marianne Phillips
Dr Christine Rodda  Dr Margerete Tilders  Dr P Jams S Price
Dr Phillip Rosengarten  Dr Brian J M Timms  Dr C Richomond
Dr I D Rawlinson  Dr David Gerald Tingay  Dr Jacqueline M Scurlock
Dr Gehan Roberts  Dr Jacinta M Tobin  Dr Peter J Silberstein
Dr Philip James Robinson  Dr Sophie C Treleaven  Dr Desiree Silva
Dr Christine Rodda  Dr F C M Veit  Dr M Slattery
Dr Phillip Rosengarten  Dr Brian G Walker  Dr Jennie Skee
Dr Katherine S Rowe  Dr Amanda M Walker  Dr Colin Somerville
Dr Margaret Rowell  Dr Craig S Walker  Dr Janine Spencer
Dr R Neil D Roy  Dr Keith D Waters  Dr Jeffrey B Stevens
Dr Monique Ryan  Dr Andrew M C Watkins  Dr Stephen Stick
Dr Luke P Sammartino  Dr Peter W Wearne  Dr Jeffrey R Tompkins
Dr Christine Sanderson  Dr Annette N Webb  Dr Russell G Troedson
Dr Kerryn R Saunders  Dr Robert G Weintraub  Dr Jack B Vercoe
Dr R Savarirayan  Dr Anthony P Weldon  Dr Ian R Walpole
Prof Susan Sawyer  Dr Susan White  Dr Andrew M Wawryk
Dr Ingrid E Scheffer  Mr S F Wickramasinghe  Dr A Wilkins-Shurmer
Dr Jill R Sewell  Dr James L Wilkinson  Dr Frank Willis
Dr Lloyd K Shield  Dr Margaret Zacharin
Dr David Sholl  Dr Harry Zehnwright

WA

Dr A J Alessandri  Dr David L Baker  Dr Geoffroy J Knight
Dr David L Baker  Dr Fiona Bettenay  Dr Rolland Kohan
Dr Fiona Bettenay  Dr Carole Caccetta  Dr Alpana Kulkarni
Dr Lynda Chadwick  Dr Gervase M Chaney  Dr Hemant Anant Kulkarni
Dr Richard J Christie  Dr Richard J Christie  Dr Kishore Kumar
Dr Hock Leng Chua  Dr Harvey L C Coates AO  Dr Jane Mary Lesslie
Dr Catherine H Cole  Dr Charles Crompton  Dr Cherry Martin
Dr Luigi D'Orsogna  Dr Harry Dumbell  Dr Judy E McMichael
Dr Harry Dumbell  Dr Alan W Duncan  Dr Helen J Mead
Dr Simon J Erickson  Dr Annette M Finn  Dr Catherine F Mews
Dr Philomena Fitzgerald  Dr Noel P French  Dr Ashanthi Munasinghe
Dr Andrew Gill  Dr Gary C Geelhoed  Dr Lakshmi Nagarajan
Dr Ian J Gollow  Dr Andrew Gill  Dr Rama Naidoo
Dr Harvey Graham  Dr Elizabeth Green  Dr Mark Parker
Dr Elizabeth Green  Dr Anna Gubbay  Dr Sanjay Patole
Prof Saxson S Gubbay  Dr Linda D Harris  Dr Bronwyn Peirce
Dr Anna Gubbay  Dr Linda A Harris  Dr Marianne Phillips
Dr Linda D Harris  Dr Linda A Harris  Dr P James S Price
Dr T Rex Henderson  Dr Noel P French  Dr C Richomond
Dr Richard Hill  Dr Gary C Geelhoed  Dr Jacqueline M Scurlock
Dr Michelle Howell  Dr Andrew Gill  Dr Peter J Silberstein
Dr Lawrence T H Hu  Dr Annette M Finn  Dr Desiree Silva
Dr Kay H Johnston  Dr Margerete Tilders  Dr M Slattery
Clin A Prof T W Jones  Dr F C M Veit  Dr Jennie Skee
Dr Bradley Jongeling  Dr Andrew Gill  Dr Colin Somerville
Dr Blanche Khaw  Dr Susan Skull  Dr Janine Spencer
Dr C Kikiros  Dr Andrew Gill  Dr Jeffrey B Stevens

Thank you to every clinician who participates in APSU surveillance, for your continued support of this important work. We look forward to your continued participation.