



# LET'S WORK TOGETHER TO BEAT MEASLES

A report on Australia's Measles Control Campaign



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## Preface

Immunisation has proved to be one of the most effective public health measures in preventing death and illness from vaccine-preventable diseases. When I was appointed to the health portfolio in 1996, I believed one of my key responsibilities was to protect the health of Australia's children. Improving Australia's waning vaccination rates was an immediate way of approaching the task. In February 1997, I announced the Immunise Australia: Seven Point Plan, an ambitious plan to increase Australia's childhood vaccination rates. These measures commenced in July 1997 with national television advertisements showing parents the distressing reality of whooping cough and urging them to have their children vaccinated.

The plan also included the first steps to eliminate measles in Australia. This began in August 1998, with the Measles Control Campaign. I was extremely proud to be involved in the largest national vaccination campaign conducted in Australia since the introduction of poliomyelitis vaccination in 1956. As in the 1950s, our primary schools were again the sites of mass vaccination in 1998. Families in every corner of Australia took up the challenge and participated in the program. In all, 1.7 million primary school children were vaccinated as part of the Campaign. This was a tremendous effort and one that prevented an estimated 17,500 children from suffering the debilitating illness associated with measles.

I would like to thank everyone who was involved in the Campaign throughout Australia, in particular State and Territory departments of health and education, doctors, nurses, local councils and schools, and a special thank you to all the families who willingly participated in this vital public health initiative.

We have shown that we can achieve great success if we work together, and we have taken steps to ensure that Australia has begun the 21st century with high vaccination rates. Our ongoing challenge is to maintain these rates and continue to improve them until all Australian children are protected against vaccine-preventable diseases like measles.

A handwritten signature in black ink that reads "Michael Wooldridge". The signature is fluid and cursive, with the first name "Michael" and last name "Wooldridge" clearly legible.

*Michael Wooldridge*

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Ms Sue Campbell-Lloyd

## ***State/Territory Campaign Coordinators:***

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**Committees:** The National Immunisation Committee, the Measles Elimination Advisory Committee.

## ***State and Territory Education Departments and non-government education associations:***

- *New South Wales:* NSW Department of Education and Training, Association of Independent Schools, Catholic Education Commission, Australian Council of Parents, Parent & Citizen Federation of NSW, NSW Parents' Council, Federation of School Community Organisations.
- *Queensland:* Education Queensland, Catholic Education Commission, Association of Independent Schools, Queensland Council of Parent & Citizen Association, Independent Parents and Friends, Federation of Parents and Friends Association.
- *ACT:* ACT Department of Education and Training, Association of Independent Schools, Catholic Education Commission.
- *Western Australia:* Education Department of Western Australia, Association of Independent Schools, Catholic Education Commission.
- *Tasmania:* Department of Education, Community and Cultural Development, Association of Independent Schools, Catholic Education Commission, Catholic Schools Parents and Friends Federation, Australian Council of Parents and Friends Association, Parents Council of Independent Schools.
- *South Australia:* South Australian Department of Education, Training and Employment, Independent Schools Board Inc, Catholic Education Office, Independent Schools Parent Council, Association of School Parent Clubs, Primary Principals' Association, Federation of Parents and Friends, Catholic Primary Principals' Association.
- *Northern Territory:* Northern Territory Department of Education, Council of Government Schools Association, Christian Schools Association, Catholic Education Commission.
- *Victoria:* Department of Education, Association of School Councils, Association of Secondary School Principals, Victorian Council of School Organisations, Victorian Principals Federation, Victorian Primary Principals Association, Australian Education Union, Victorian Federation of State School Parent Clubs, Catholic Education Commission.

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# Summary

The Measles Control Campaign was conducted by the Commonwealth in conjunction with all States and Territories between August and November 1998. The Campaign was the first stage of a long-term strategy to eliminate measles from Australia.

## Background

The introduction of a measles-containing vaccine to Australia in 1968 had a dramatic impact on the number of measles cases, but immunisation levels were not high enough to prevent episodic outbreaks across Australia. There was an epidemic of measles in 1993-1994, and local projections suggested that another epidemic was likely in 1998 (Forrest et al 1998).

A measles control program with a two-dose vaccination schedule has operated since late 1994. In 1997, a measles elimination program was announced as part of the 'Immunise Australia: Seven Point Plan'. After preliminary research into overseas measles elimination campaigns, existing levels of measles immunity in Australia, and the cost and practicality of various options, the Measles Elimination Advisory Committee (MEAC) developed a strategy for measles elimination in Australia. The first step was to recommend to the National Health and Medical Research Council (NHMRC) that the second dose of Measles, Mumps, Rubella (MMR) vaccine be brought forward from 10-16 years of age to 4-5<sup>1</sup> years. This was done to shorten the interval between the two MMR doses to three years, thereby reducing the risk of an epidemic outbreak.

With this change to the schedule, a one-off vaccination campaign was necessary to ensure that children aged 5-12 years received their second dose. Accordingly, the Measles Control Campaign was planned and implemented. The main component of the Campaign was a school-based vaccination program that offered a dose of MMR vaccine to primary school age children. Preschool age children were reached through letters to parents asking them to ensure that their child had received their first dose of MMR vaccine. As well, principals of high schools were encouraged to provide information to students and their parents to ensure that the two-dose measles vaccination schedule had been completed.

To support the implementation of the Campaign, a comprehensive communication and social marketing strategy was developed. The strategy consisted of three major components: mass media advertising; direct marketing to parents and school principals; and public relations activities.

An integral part of the Campaign was the evaluation component, to assess both the reach and coverage of the Campaign.

The Campaign was funded and coordinated by the then Commonwealth Department of Health and Family Services (now Health and Aged Care). Funding of \$30.8 million was allocated to the Campaign, with key areas of expenditure being vaccines, communication activities and service delivery. States and Territories also contributed to the service delivery aspects of the Campaign.

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1 Since the Campaign, the schedule has been modified and now specifies 4 years as the age for the second dose.

## Results of the Measles Control Campaign

The Campaign resulted in a significant increase in levels of protection against measles among preschool and primary school age children, and averted an estimated 17,500 cases of measles (NCIRS 1999).

The Campaign was very successful in reaching primary school age children, with around 1.7 million or 96 per cent of children this age being vaccinated during the Campaign. More than 1.3 million of these children were vaccinated in the school program, in almost 8,800 schools in all States and Territories. A serosurvey conducted after the Campaign showed that 94 per cent of children aged 6-12 years were immune to measles, an increase from 84 per cent before the Campaign. The results of the Campaign for this age group were proportionally equal to or better than the measles vaccination program conducted in the United Kingdom in 1994. Parents showed significant support for the Campaign, with 89 per cent reporting that they were satisfied with the primary school program, and 87 per cent indicating that they would be willing to have their child vaccinated at school in future programs.

The Campaign also had an effect in the preschool group. It was estimated that 97.5 per cent of those aged 12-42 months had received their first dose of MMR vaccine, and serology showed that 89 per cent of children aged 2-5 years were protected, a rise from 82 per cent before the Campaign. Approximately 18,000 children who were due or overdue for the first dose of MMR vaccine at the beginning of the Campaign were vaccinated. By far the majority of parents (86 per cent) made favourable comments about the Campaign and the reminder letter.

The post-Campaign serosurvey showed that only 66 per cent of younger children aged 12-24 months were protected against measles. While the figures for older preschool children indicate that by school age most children had received their first MMR dose, the relatively low level of protection among younger children suggests that they were not receiving their first dose of MMR vaccine at the recommended age of 12 months.

The post-Campaign serosurvey also showed that the level of seropositivity in young people aged 12-18 years who were not directly targeted in the Campaign remained static at 91 per cent before and after the Campaign.

There were 89 serious adverse events during the Campaign that were assessed as having a causal link to the MMR vaccination. Of these, 46 were assessed to be certainly caused by the MMR vaccine, 23 as probably caused by the vaccine and 20 as possibly associated with the vaccine. The overall proportion of serious adverse events was 5.2 per 100,000 doses of vaccine administered. This rate was considerably lower than the proportion reported during the measles program in the United Kingdom. There were no deaths associated with the Campaign. The risks associated with MMR vaccination were clearly outweighed by the benefits of vaccination in providing protection against measles, mumps and rubella.

The communication strategy was a highly successful component of the Campaign. The post-Campaign parent survey showed that 96 per cent of parents who had a child vaccinated as part of the Campaign were satisfied with the Campaign. Awareness of the Campaign and of the need to sign a consent form both peaked at 97 per cent during the Campaign. The information pack and television advertisements had the highest reach of the Campaign elements, with up to 88 per cent and 86 per cent of the target group reporting awareness of these elements respectively during the Campaign.

## Future strategies for measles elimination

As part of the evaluation of the Measles Control Campaign, the National Centre for Immunisation Research and Surveillance of Vaccine Preventable Diseases (NCIRS) suggested that future efforts to eliminate measles in Australia should focus on achieving high levels of coverage from a two-dose strategy and placing an increased effort on surveillance activities.

The NCIRS identified the following three target age groups in need of special consideration:

- young people aged 12-18 years, among whom deficiencies exist in the levels of immunity to measles, and who were not directly targeted in the Campaign. This group would benefit from a targeted campaign to deliver the second dose of MMR vaccine;
- toddlers, many of whom are not receiving their first dose of MMR on time at 12 months of age. Programs should be implemented to ensure that this dose is administered promptly at 12 months of age; and
- children aged 4 years, the age now scheduled for the second dose of MMR. Steps should be taken to ensure that uptake of the second dose of MMR among this group is at least 95 per cent.

## Progress on Elimination Strategies

To ensure Australia continues to progress towards measles elimination, the Measles Elimination Advisory Committee (MEAC) has overseen the revision of national *Guidelines for the Control of Measles Outbreaks in Australia*.

Where previously these guidelines had focussed on the prevention and response to measles outbreaks, the revised recommendations have incorporated the results and subsequent findings from the Measles Control Campaign to emphasise the requirements for:

- sustained, optimal measles vaccination at twelve months and four years of age, including an effective monitoring and response system for ensuring timely vaccination and identification of susceptible sub-populations;
- enhanced measles surveillance and reporting; and
- capacity and preparedness for rapid control response to measles cases.

### Vaccination Strategies

There have been a number of initiatives introduced nationally which actively support increased vaccination uptake and further assist specific efforts in maintaining high measles vaccination coverage.

#### ***The Australian Childhood Immunisation Register (ACIR)***

In addition to its use prior to, and during the Measles Control Campaign, the ACIR is able to monitor measles immunisation rates at national, state/territory and local level. The ACIR also provides Child History Statements to parents/guardians at key immunisation milestones: 12 months, 24 months and 5 years. The Statement advises parents of the current immunisation details recorded by the ACIR, and also identifies vaccinations missing or overdue, which could prevent their child's record being assessed as 'up-to-date'. Parents as well as immunisation providers may request additional statements at any time.

### ***Immunisation Incentives for Parents***

An initiative which promotes timely immunisation for vaccines on the recommended immunisation schedule, is the linking of immunisation status to eligibility for childcare benefits. These measures ensure that government subsidies paid for childcare support are only available to parents whose children are age appropriately vaccinated or have a valid exemption.

### ***Immunisation Incentives for General Practitioners***

The General Practice Immunisation Incentives Scheme provides financial incentives for general practitioners to monitor, promote and provide age appropriate immunisation services to children under the age of seven years in their practice.

The Scheme provides payment for individual vaccination services provided and monitors practice coverage levels as the basis for outcome based tiered bonuses for achieving immunisation coverage of 80% and 90% and greater.

### ***School Entry Immunisation Requirements***

Legislation and regulations governing the requirements for providing documentation on immunisation status prior to commencing school currently exists within four states and territories in Australia.

The Commonwealth government has developed 'model' legislation pertaining to these requirements which will assist in a consistent approach to school entry requirements for immunisation nationally. School entry requirements specifically aid in promoting uptake of the second dose measles vaccination.

### ***Measles Immunisation Targets***

The targets set for national measles vaccination coverage are;

By the year 2001:

- 95 percent coverage of children with one dose of measles containing vaccine by their second birthday; and
- 95 percent coverage of children with at least one dose, and 90 percent with two doses of measles containing vaccine by school entry.

Coverage data released from the Australia Childhood Immunisation Register on 30 June 2000 reported Measles Mumps Rubella vaccination coverage of 91 percent for children aged 24 to 27 months. Second dose measles vaccination coverage figures for children at school entry will be routinely reported by the ACIR from 2001.

### ***Surveillance Strategies***

In addition to improving vaccination levels, Australia's progress towards measles elimination encompasses enhancements in measles surveillance to improve the National Notifiable Diseases Surveillance System's sensitivity to detect every case of measles.

A detailed strategy for measles surveillance (Heath et al 1999) has been endorsed by the Communicable Diseases Network of Australia and New Zealand (CDNANZ) and outlines the elements required for:

- detecting cases and the source of infection rapidly so that timely control measures can be implemented;
- detecting resurgence of indigenous measles transmission;

- detecting importation of measles; and
- monitoring serious complications of measles infection.

These components are being progressed through the education of General Practitioners and other physicians to report suspected cases of measles while awaiting confirmation, active case finding following a confirmed measles case, routine collection of vaccination history as part of the measles surveillance data set, and the routine reporting of notified measles cases in fortnightly teleconferences.

### **Response Strategy**

The *Guidelines for the Control of Measles Outbreaks in Australia* outline the protocol for rapid response to an outbreak of measles. This includes recommendations for case detection and isolation, contact tracing and post exposure prophylaxis and communication strategies during an outbreak at local, state or national levels.

The primary aim in preventing transmission of measles is the development of the surveillance system so as to detect every case of measles and provide a rapid response to prevent further transmission once a case is detected. The key to achieving this is the reduction of delays from the onset of illness to notification to public health authorities.

# Introduction

The Measles Control Campaign, *Let's Work Together to Beat Measles* was conducted between August and November 1998 by the Commonwealth in conjunction with all States and Territories. The main component of the Campaign was a school-based vaccination program that offered a dose of measles, mumps and rubella (MMR) vaccine to primary school children. The Campaign was the largest national vaccination program conducted in Australia since the introduction of poliomyelitis vaccination in 1956. It was the first stage of a long-term strategy to eliminate measles from Australia, and will ensure that Australia is well-placed in the World Health Organisation's (WHO) efforts to eradicate measles worldwide.

Measles is a highly infectious illness that primarily affects the respiratory tract. It is caused by a virus that is spread readily by air droplets. It can be a severe disease complicated by pneumonia (4 per cent of cases) and ear infections (2.5 per cent of cases). Acute encephalitis occurs in one in 2,000 people who develop measles, and for every 10 children who develop measles encephalitis, one will die and up to four will have permanent brain damage (NHMRC 1997). Sub-acute sclerosing panencephalitis (SSPE) is a late complication of measles in about 1 in 25,000 cases. SSPE causes progressive brain degeneration and is always fatal.

Even though measles has declined significantly in Australia and worldwide over the last 25 years, the measles-virus continues to circulate. More than 16,000 cases of measles were reported in Australia between 1988 and 1998.

There was a measles epidemic in Australia in 1993-1994, and serosurveys in South Australia in 1997 suggested that another epidemic was likely in 1998 (Forrest et al 1998). A measles control program with a two-dose vaccination schedule has operated since November 1994. In 1997, a measles elimination program was announced as part of the 'Immunise Australia: Seven Point Plan'. The Measles Elimination Advisory Committee (MEAC) was established to assist the Commonwealth Department of Health and Family Services in advising the Minister of the most appropriate strategy for this task. Membership of MEAC over the period August 1997 to August 1999 is given at Appendix 1.

After preliminary research into overseas measles elimination campaigns, existing levels of measles immunity in Australia, and the cost and practicality of various options for measles elimination, MEAC recommended the following strategy:

- bringing forward the second dose of MMR from age 10-16 years to age 4-5 years;
- offering MMR vaccination to all children in primary schools throughout Australia;
- conducting a campaign targeting all preschool age children by encouraging parents and general practitioners (GPs) to ensure that this cohort had received at least one dose of MMR vaccine; and
- encouraging parents of high school age children to ensure that their children had received two doses of measles vaccine.

These components are described in subsequent chapters of this report, with a focus on the primary school campaign.

## Scope of this report

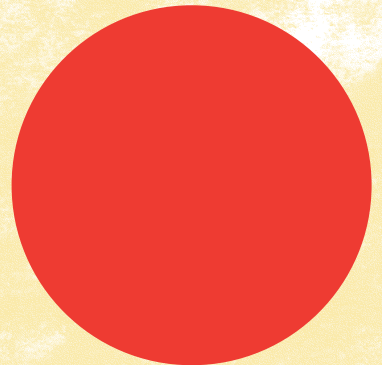
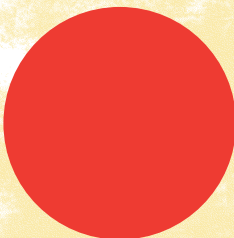
This report aims to outline the context in which the Campaign was developed, the planning stages, implementation (including the communication strategy), and results of the evaluation. It includes sections on:

- the changing epidemiology of measles and Australian and overseas efforts to control measles (Chapter 1);
- planning, development and administrative arrangements of the Campaign (Chapter 2);
- implementation of the Campaign, with a focus on the primary school vaccination program (Chapters 3);
- the Campaign's multi-faceted media and communications strategy (Chapter 4);
- the comprehensive evaluation undertaken to assess the vaccination coverage achieved and impact of the Campaign (Chapter 5); and
- findings and strategies for future efforts to control measles in Australia based on the conduct and results of the Campaign (Chapter 6).

The evaluation of the Campaign was commissioned by the National Centre for Disease Control (NCDC) and was undertaken by the National Centre for Immunisation Research and Surveillance of Vaccine Preventable Diseases (NCIRS). The studies carried out in this evaluation were approved by the Departmental Ethics Committee of the Commonwealth Department of Health and Family Services at its meeting in October 1998 (Ethics Register Number: 98/0135).

A separate evaluation of the communication strategy was commissioned by the Research and Marketing Group and conducted by the Wallis Consulting Group Pty Ltd.

# Background to the Measles Control Campaign





The Measles Control Campaign (MCC) was the first step in a strategy to eliminate measles from Australia. However, there was considerable earlier work to control measles, both in Australia and overseas. Earlier strategies and campaigns raised community awareness of the importance of vaccination and contributed to the eventual success of this Campaign.

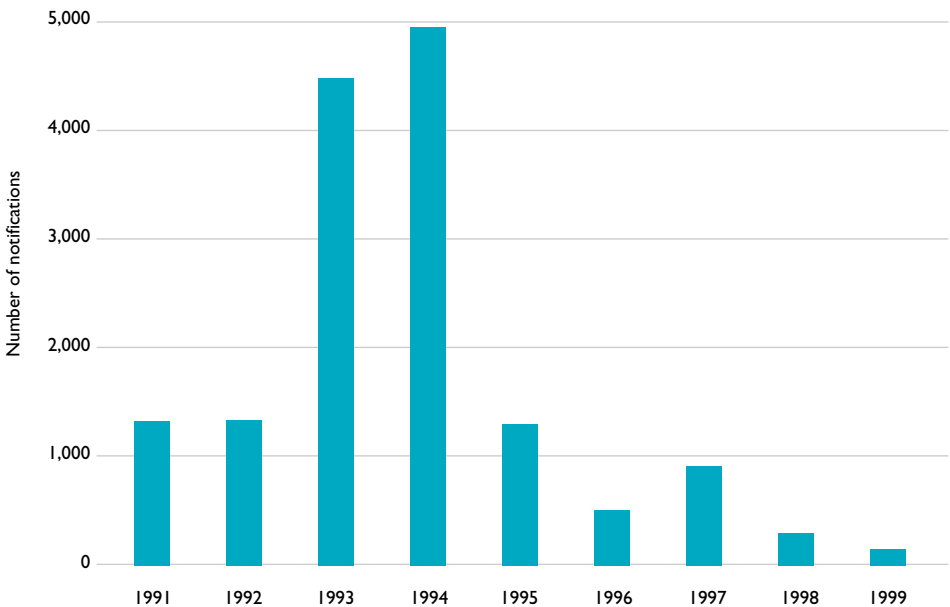
In this chapter, the background to the Campaign is described, to explain why it was necessary and to give the context in which planning and implementation occurred. The international experience of measles control is also discussed, so that Australia's efforts can be viewed in the context of efforts to control and eventually eradicate measles worldwide.

## 1.1 Measles in Australia

Figures from the Australian Bureau of Statistics (ABS) show that measles was responsible for 98 deaths in Australia between 1976 and 1995. Over this 19-year period, measles caused more deaths in Australia than diphtheria (4 deaths), pertussis (21 deaths) and tetanus (52 deaths) combined (NHMRC 2000).

The introduction of a measles-containing vaccine to Australia in 1968 had a dramatic impact on the number of measles cases. However, uptake of the vaccine was not high enough to prevent episodic outbreaks across Australia. Between 1993 and 1994, an epidemic of measles affected Australia, with a total of 9,431 cases notified and reports of two deaths. A marked decrease in measles notifications has occurred since this epidemic (Figure 1.1).

Figure 1.1: **Measles notifications in Australia, 1991-1999**



Source: National Notifiable Diseases Surveillance System.

## 1.2 Changing from outbreak prevention to measles elimination

In 1987-1988 the Bicentennial Campaign Against Measles was conducted throughout Australia, largely prompted by the 1983 ABS survey which showed that coverage for measles was a low 63 per cent (ABS 1995). The 1989-1990 ABS survey showed that coverage had reached 85 per cent (ABS 1995).

A two-dose MMR vaccination policy was introduced into Australia in November 1994, with the second dose replacing the schoolgirl rubella vaccination program. The recommended ages for the two doses for both males and females was 12 months for the first dose and 10-16 years for the second dose.

However, measles outbreaks continued to occur. If no action was taken, both international experience and local projections indicated that Australia was due to experience another major measles epidemic in 1998 (Forrest et al 1998).

In February 1997, the Commonwealth Minister for Health and Family Services (now Health and Aged Care), announced the 'Immunise Australia: Seven Point Plan'. This Plan proposed seven initiatives to improve childhood vaccination rates, and a specific focus on measles:

- restructuring the Maternity Allowance to provide a bonus to parents for ensuring that their child's vaccination coverage was complete and linking eligibility for Childcare Assistance and Childcare Rebate to a child's vaccination status;
- encouraging GPs to obtain high childhood vaccination coverage levels (later implemented through the General Practice Immunisation Incentives scheme);
- publishing vaccination rates from the Australian Childhood Immunisation Register (ACIR) to encourage competition and provide incentives to improve low rates of coverage;
- implementing a one-off national 'Immunisation Days' pilot program;
- developing a measles elimination program in consultation with States and Territories;
- establishing a national immunisation research centre and conducting a communication campaign to target parents of children aged 0-6 years and vaccination providers with the aim of increasing the level of full age-appropriate childhood vaccination coverage; and
- working with State and Territory governments to introduce school entry requirements to ensure that parents submit details of children's vaccination history on their child's enrolment at school.

Implementing this Plan meant a change from outbreak prevention of measles to a goal of eliminating the disease. To facilitate this progression, MEAC considered schedule changes and advised the National Health and Medical Research Council (NHMRC) to shorten the interval between the two MMR doses (NHMRC 1998). By bringing the second dose forward from 10-16 years of age to 4-5 years of age, the gap between the first dose of MMR and the second dose became three years, thus reducing the risk of an epidemic outbreak (Forrest et al 1998).<sup>2</sup> The first dose of MMR remained scheduled at 12 months of age.

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2 The MMR vaccine is up to 95 per cent effective after one dose if stored and administered correctly. It is at least 99 per cent effective after two doses. If 90 per cent of children received the vaccine and the vaccine is 95 per cent effective then only 85.5 per cent of children would be immune to measles after one dose. Since the birth cohort in Australia is approximately 250,000 per year the number of unimmunised children in Australia increases by approximately 36,000 each year. Ten years between the first and second dose of vaccine generates a pool of approximately 360,000 susceptibles, enough to sustain an epidemic. Therefore, by bringing the second dose of MMR forward to 4-5 years of age, there is only three to four years available for susceptibles to build up before the second dose, which lessens the risk of an epidemic occurring.

The amendment to the MMR schedule and the cessation of the adolescent program meant that the cohort of children who were attending primary school (5-12 year olds) would not receive a second dose of vaccine. Therefore, a one-off vaccination program was needed to ensure that these children did not miss out on their second dose.

## Vaccination coverage targets

The principal objectives of the measles elimination initiative are to:

- cease measles-related morbidity and mortality, by interrupting indigenous transmission of measles; and
- prevent reintroduction of measles until global eradication is achieved, by maintaining uniformly low levels of population susceptibility (Heath et al 1999).

In order to achieve these objectives, very high vaccination coverage levels are needed, especially in closed settings such as schools where contact rates are high. Uniformity of coverage is also important, because pockets of people who are susceptible to measles can perpetuate endemic transmission. The following vaccination coverage targets were set by the Communicable Diseases Network Australia New Zealand (Heath et al 1999).

By the year 2000:

- 90 per cent coverage of children with two doses of measles-containing vaccine by school entry; and
- 95 per cent coverage of primary school children with one dose of measles-containing vaccine in a school-based campaign.

By the year 2001:

- 95 per cent coverage of children with one dose of measles-containing vaccine by their second birthday (ie 10 per cent susceptible due to vaccine effectiveness of 95 per cent);<sup>3</sup> and
- 95 per cent coverage of children with at least one dose, and 90 per cent with two doses of measles-containing vaccine by school entry (5 per cent susceptibility).<sup>4</sup>

Following the excellent results of the Campaign, Australia is on target to fulfil the national measles vaccination coverage targets set for the year 2000. Detailed results of the Campaign are given in Chapter 5 of this report.

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3 If there is 95 per cent coverage with one dose and 95 per cent vaccine effectiveness, 90.25 per cent (ie 95 per cent of 95 per cent) of children are immune. Therefore approximately 10 per cent are susceptible.

4 If there is 90 per cent coverage with two doses and 100 per cent vaccine effectiveness, then all of these 90 per cent are immune. Another 5 per cent have had one dose. With 95 per cent vaccine effectiveness, 4.75 per cent of the children are immune (95 per cent of 5 per cent) and 5 per cent are not immune because they have had no dose. The total proportion who are immune is therefore 94.75 per cent (90+4.75+0), leaving approximately 5 per cent susceptible.

## 1.3 Overseas efforts to eliminate measles

Australia's efforts in measles control and elimination are an integral part of worldwide efforts to eradicate measles.

Since the inception of the WHO's Expanded Programme on Immunisation in 1974, the numbers of cases and deaths from measles worldwide has declined substantially, from an estimated 100 million cases and 5.8 million deaths in 1980, to an estimated 44 million cases and 1.1 million deaths in 1995.

Between 1985 and 1990, the number of measles cases reported worldwide declined by 56 per cent. Governments, international agencies and other organisations provided the human and financial resources needed to reach the global goal of 80 per cent infant vaccination coverage by the year 1990.

In the 1990s, further advances were made in measles control, particularly in the Americas. Indigenous measles transmission has been interrupted in several Latin American countries, the English speaking Caribbean, and the United States (WHO et al 1997; CDC 1997). Successful measles control overseas has been achieved through mass vaccination programs to preschool and school age children, or maintaining high coverage for a prolonged period with a two-dose measles vaccination schedule (WHO et al 1997). Progress towards measles elimination overseas is detailed in Chapter 2.

Despite these achievements, measles remains one of the leading causes of child mortality in developing countries, responsible for approximately 10 per cent of all deaths among children less than 5 years of age.

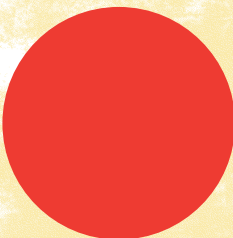
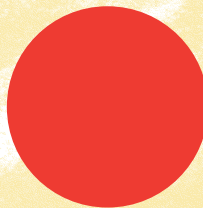
In July 1996, a joint meeting of the WHO, the United States Centers for Disease Control and Prevention, and the Pan-American Health Organization was convened to consider the feasibility of global measles eradication (WHO et al 1997). This group recommended the goal of global measles eradication, with a target date between 2005 and 2010.

### **Summary – Background to the Measles Control Campaign**

- Measles was responsible for 98 deaths in Australia between 1976 and 1995. Over this 19-year period measles caused more deaths in Australia than diphtheria, pertussis and tetanus combined.
- The introduction of a measles-containing vaccine to Australia in 1968 had a dramatic impact on the number of measles cases, but immunisation levels were not high enough to prevent episodic outbreaks across Australia. There was an epidemic of measles in 1993-1994, with local projections suggesting another epidemic was likely in 1998.
- A measles control program has operated since 1994. In 1997, a program for measles elimination was announced. To facilitate the change from outbreak prevention to a goal of eliminating measles, the second dose of MMR vaccine was brought forward from 10-16 years of age to 4-5 years. This was done to shorten the interval between the two MMR doses to three years, thereby reducing the risk of an epidemic.
- A one-off Measles Control Campaign was necessary due to the change in the timing of the second dose of the MMR vaccine, to ensure that all primary school children aged 5-12 years received their second dose.
- Significant achievements in measles control have been made in many countries, although it is still a leading cause of child mortality in developing countries. Australia's efforts in measles control and elimination are an integral part of worldwide efforts to control and eventually eradicate measles.

2

## Australia's response—the Measles Control Campaign



**T**his chapter discusses the planning and development of the Campaign. MEAC undertook extensive background research before making recommendations for a measles elimination strategy.

The recommendations of the WHO on global measles eradication and international experiences of vaccination programs were examined. In addition, Australian serosurveillance data from South Australia and New South Wales was commissioned, in order to determine existing levels of susceptibility to measles in children, adolescents and young adults.

To inform the development of options for a mass measles vaccination program, a study of the costs and logistics of planning and delivering a national school-based campaign was commissioned, and a workshop of experts was held to discuss logistical, funding and surveillance issues.

Based on this background research, MEAC considered various options for measles elimination and recommended the change to the schedule and a one-off school-based mass vaccination campaign for all primary school students, complemented by communication with parents of preschool and high school children to encourage measles vaccination in these age groups. These elements were to form the first stage of a longer-term strategy for the elimination of measles from Australia.

The development of the Campaign strategy involved defining Commonwealth and State/Territory responsibilities and the administrative framework within which the Campaign would operate, including budget allocation.

Consultation with stakeholders about all aspects of the Campaign, including the information pack and consent form, was an integral part of development and planning.

## 2.1 Development and planning

MEAC met on 11 occasions over the period August 1997 to July 1998, in the period preceding the Campaign. It was informed through reviews of measles elimination activities in other countries, consultation with international and national experts, and the commissioning of research on the seroprevalence of measles immunity within the Australian community and the feasibility of conducting a school-based measles vaccination campaign.

### The international experience

In considering an appropriate measles elimination strategy for Australia, MEAC reviewed relevant experiences in other countries relating to measles control and elimination, and the recommendations of the WHO on global measles eradication.

According to the WHO, the accumulation of susceptible persons over time is the most serious impediment to the elimination of measles. Because measles vaccine efficacy is not 100 per cent, even very high coverage rates do not prevent the accumulation of susceptibles (vaccine failures plus missed vaccination).

Countries with the greatest success in measles control have used a combination of strategies, including a two-dose vaccination schedule and a mass vaccination campaign where necessary. While mass campaigns are able to interrupt endemic transmission quite quickly, very high routine vaccination coverage or smaller follow-up campaigns are needed to prevent the reappearance or reintroduction of measles.

## Working towards global measles eradication

At their joint meeting in July 1996, WHO, the Pan-American Health Organization and the Centers for Disease Control and Prevention (United States) agreed that measles eradication was feasible with available vaccines and recommended adoption of the goal of global eradication with a target date between 2005 and 2010 (WHO et al 1997). It was noted that immunisation strategies relying on one dose of a measles-containing vaccine would not succeed, and that successful interruption of measles virus transmission in the Americas was the result of a three-tiered vaccination strategy that included:

- a 'catch-up' vaccination for all children aged 1-14 years, regardless of disease history or vaccination status;
- high routine vaccination coverage of greater than 90 per cent of children in each successive birth cohort at 12 months of age; and
- 'follow-up' vaccination campaigns whenever the pool of susceptibles in the preschool age population approximated the size of a typical birth cohort (approximately every three to five years).

It was noted that other strategies may work better in different countries or regions. The meeting also made recommendations about the critical role of disease surveillance and outbreak control in efforts to eliminate or eradicate measles.

It was concluded that:

the major obstacles to measles eradication are not technical but perceptual, political and financial. Measles is often mistakenly perceived as a mild illness. This misperception, which is particularly prevalent in industrialised countries, can inhibit the development of public and political support for the allocation of resources required for an effective elimination effort. The disease burden imposed by measles should be documented, particularly in industrialised countries, so that this information can be used to educate parents, medical practitioners, public health workers, and political leaders about the benefits of measles eradication.

(WHO et al 1997, p2)

## International experience of measles control

Measles control initiatives vary in different regions as follows.

- The United States has had a two-dose measles vaccination schedule since 1989, with later implementation of a legislative requirement for the second dose before school entry. These initiatives have been coupled with good outbreak control measures, leading to a decline in reported cases of measles and epidemiological evidence suggesting the interruption of transmission of indigenous measles.
- In the United Kingdom, a national measles vaccination campaign was conducted in 1994, targeting school children from 5-14 years of age using a measles/rubella vaccine. Eight million children were vaccinated with a mean coverage rate at district level of 92 per cent. Within two months the number of reported cases of measles fell to about 20 per cent of the previous year's level and this decrease in disease incidence has been maintained.



- In the Western Pacific Region, measles control activities have accelerated in several countries, through achieving and maintaining high routine vaccination coverage of infants, identifying and targeting low coverage districts for special attention, achieving effective measles surveillance, and if necessary conducting large-scale vaccination campaigns targeting a wide age group.
- All Latin American countries had conducted 'catch-up' campaigns by the end of 1995. The estimated measles vaccination coverage for children aged 1-14 years in Latin America and the English-speaking Caribbean exceeded 93 per cent. Measles is now rare in Latin America and the Caribbean.

## **Serosurveillance research**

Two serosurveillance projects were commissioned by the Commonwealth Department of Health and Family Services:

- the South Australian Health Commission conducted a measles serosurvey between January 1996 and June 1997 to determine susceptibility to measles among children and adolescents in South Australia; and
- the NCIRS conducted a seroprevalence study from June to November 1997, to determine the proportion of adolescents and young adults in New South Wales who were susceptible to measles.

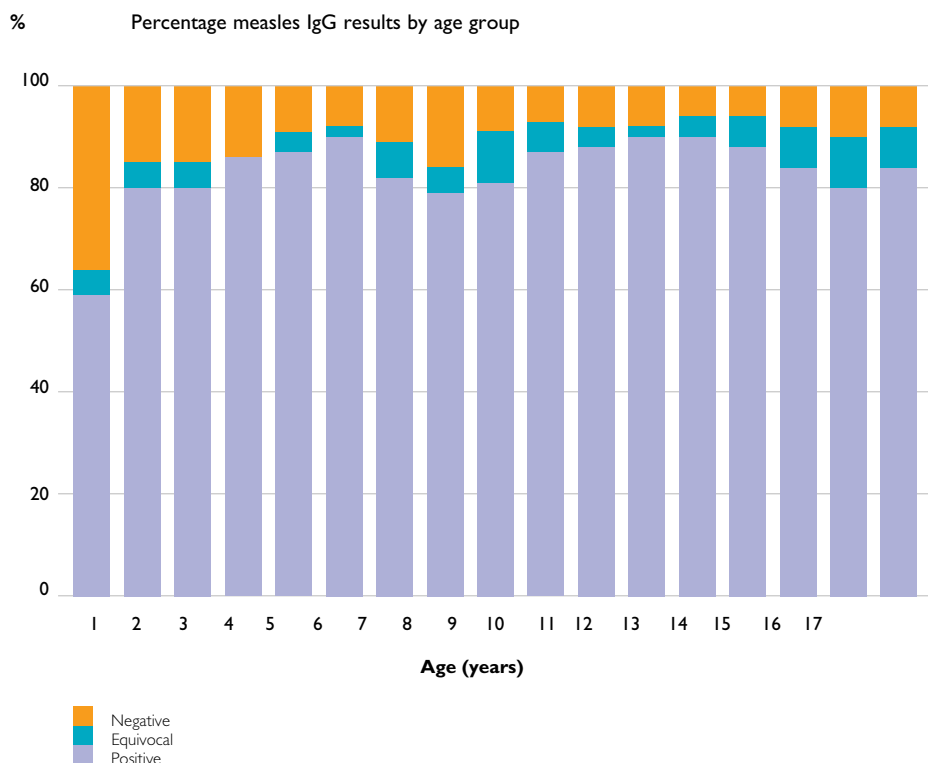
## **South Australian results**

A total of 2,029 specimens were collected for immunoglobulin G (IgG) testing from children aged 1-18 years. Findings indicated that 83.8 per cent of participants had measles immunity (were positive to IgG), 9.3 per cent were not immune (negative to IgG), and 6.9 per cent had equivocal results. By age group, the percentage not immune ranged from 6.3 per cent among 14-14.9 year olds to 35.1 per cent for 1-1.9 year olds (Figure 2.1).

These results indicated that there were probably enough susceptible children in the South Australian population to support a measles epidemic. The high level of susceptibility in the 1-1.9 year age group could have indicated a delay in uptake of the first dose of MMR vaccine, scheduled at 12 months of age.

**Figure 2.1: South Australian serosurveillance results**

Specimens collected between 8 January 1996 and 30 June 1997.



Source: South Australian Health Commission (unpublished).

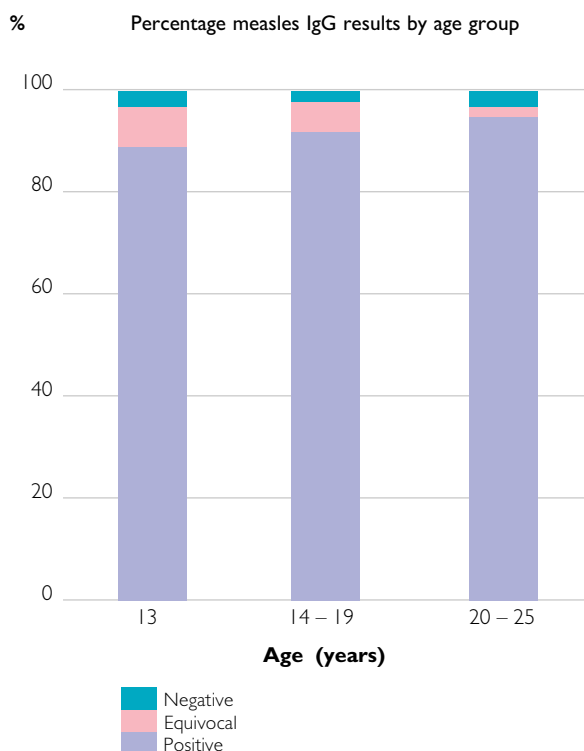
## New South Wales results

A total of 1,300 specimens were collected for IgG testing, from people aged 13-25 years. Findings indicated that a total of 90.9 per cent of patients had measles immunity (were positive to IgG), 5.2 per cent were not immune (negative to IgG) and 3.8 per cent had equivocal results.

By age group, the percentage not immune was 3 per cent among 13 year olds, 8 per cent among 14-19 year olds and 3 per cent among 20-25 year olds (Figure 2.2). The results indicated that a significant proportion of adolescents in the age group 14-19 were susceptible to measles or had low antibody levels.

The high level of susceptibility in the 14-19 year age group may have indicated a delay in uptake or no uptake of the second dose of MMR vaccine at 10-16 years, introduced in 1994 but not widely implemented until 1995-1996.

**Figure 2.2: New South Wales serosurveillance results**  
Specimens collected between June and November 1997.



Source: Gilbert et al (1998).

## Costings and feasibility of a school-based campaign

To inform planning of the delivery of a mass measles vaccination program, the Centre for Health Economics Research and Evaluation was commissioned to conduct a costing of such a national program. The resulting report was prepared in consultation with State and Territory health departments and provided an overview of the cost of current school-based vaccination programs. It also investigated the logistics of planning and delivering a national school-based campaign.

The report concluded that a national vaccination program aimed at vaccinating every school child in Australia was feasible and specified the time and staff resources required for both primary and high school campaigns (CHERE 1997).

The report noted that the detail of vaccination delivery would vary from State to State and for geographical areas (ie urban versus rural and remote areas). The geographical size and population densities of Australia would contribute to these variations.

It was estimated that the primary school component would cost \$15.5 million, and both the primary and high school components would cost \$24.6 million. These estimates did not include costs of vaccine purchase, transport and distribution or the cost of a national program coordinator.

## Workshop of experts

In November 1997, a workshop was held to discuss the logistical, funding and surveillance issues of a measles elimination campaign. Participants at the workshop included MEAC members, representatives of State and Territory health departments and invited guest speakers.

An overview of the WHO strategy for the global elimination of measles was given, involving the three-tiered strategy of 'catch up' (once-only vaccination campaign), 'keep-up' (high routine vaccination coverage) and 'follow-up' (campaigns once the pool of susceptibles reaches one birth cohort in size). A range of other issues were discussed including the epidemiology of measles in Australia, the need for enhanced surveillance activities in the elimination phase, the role of laboratory diagnosis and the costs and logistics of mounting an elimination campaign.

In conclusion, workshop participants suggested that all children aged 2-18 years could be targeted for a dose of MMR vaccine and that the second dose of MMR vaccine be brought forward from 10-16 years to 4-5 years (ie before school entry).

## Options for measles control and elimination

After taking into account all the evidence provided in relation to current epidemiology of measles, international programs and activities, and advice from experts, MEAC considered the following options for measles control and elimination in Australia. Each option was predicated on the proposed change to the measles vaccination schedule.

- **Option 1** – Mass vaccination of all primary school age children.
- **Option 2** – A mass measles vaccination campaign for all children/students from the age of 12 months to the last year of high school together with individual follow-up for non-attendance, including a mailout from the ACIR for children less than 5 years of age.
- **Option 3** – Two doses of measles vaccine before school entry and maintenance of the high school vaccination for six years.

Key considerations were logistics and cost. MEAC therefore recommended that Option 1 be implemented as the first stage of a longer-term measles elimination strategy, with other strategies used to encourage compliance with the first dose of vaccine among preschool children and with the second dose among high school students.

## 2.2 A national strategy for the Measles Control Campaign

Option 1 was developed into a strategy for the Campaign. The components of the strategy were:

- to conduct a campaign to vaccinate on parental consent, all children in primary schools throughout Australia;
- to encourage parents and GPs to ensure that all preschool age children had received at least one dose of MMR vaccine; and
- to encourage parents of high school age children to ensure that their children had received two doses of measles vaccine.

The strategy was enhanced by: State and Territory school entry legislative requirements; the system of childcare-related payments dependent on vaccination status; the introduction of the General Practice Immunisation Incentives scheme in July 1998; and the ACIR system of reminder letters to parents.

### **Primary school-based campaign (5-12 year olds)**

MEAC recommended that registered nurses be recruited and trained to conduct the Campaign so that existing services would not be disrupted. A model for school-based vaccination clinics was developed, with teams of two registered nurses and one administrative assistant to vaccinate in schools at a rate of 300 children per team per day, over the 60 working day period from August to November 1998.

Some States and Territories indicated that they would conduct follow-up clinics to vaccinate children who missed vaccination on the school clinic day through absence or illness. It was also acknowledged that some parents would have their children vaccinated by their local medical practitioner or immunisation clinic.

### **Preschool aged children (1-5 year olds)**

A letter was to be sent from the Health Insurance Commission to the parents of all children recorded on the ACIR as being overdue for the 12-month MMR vaccine. The parents of these children would be advised to attend their usual immunisation service provider to update the child's vaccination status. The aim of this component of the Campaign was to maximise coverage for the first dose of measles vaccine.

### **High school aged children (12-18 year olds)**

A letter would be sent to the parents of all high school students explaining that while a national MMR vaccination program had been conducted for the past four to five years in the first year of high school or the last year of primary school, coverage for this dose was not optimal in all States and Territories and clearly some children had missed out on receiving this second dose. Parents were to be advised of the change to the routine vaccination schedule, the importance of the second dose and asked to ensure that their child had received two doses of MMR vaccine.

## **Roles and responsibilities of the Commonwealth and States and Territories**

The funding arrangements and the roles and responsibilities of the key government agencies in the implementation of the Campaign were negotiated and defined in contracts between the Commonwealth Department of Health and Family Services and the State and Territory health departments.

### **Commonwealth responsibilities**

The Commonwealth agreed to provide funds to States and Territories to meet the costs of employing a State/Territory Coordinator and service delivery staff and other expenses such as transport and communication. The Commonwealth also provided vaccines and disposable items, and funds for an extensive public education campaign and evaluation of the Campaign.

Specifically, the Commonwealth agreed to:

- provide funding to the States/Territories for the following purposes:
  - the employment of service delivery teams;
  - the hire of one mobile phone and one motor vehicle for each service delivery team;
  - service delivery enhancement for rural and remote localities; and
  - the purchase of contaminated waste bags and adrenaline;
- liaise with and assist the State/Territory Coordinators in the implementation of the Campaign;
- provide support and direction via the National Campaign Manager;
- undertake a process of consultation with State/Territory departments of education, Catholic Education Commissions, Associations of Independent Schools and State/Territory health departments;
- develop and provide the following materials to the States and Territories for use in the Campaign:
  - written information on the benefits and risks of vaccination, and
  - consent forms;
- provide the States and Territories with vaccine and disposable items for use in the Campaign;
- provide the States and Territories with a public education strategy and public education material to promote and support the Campaign;
- provide regular national data to the States and Territories on the progress of the Campaign, including reported adverse events following vaccination; and
- evaluate the Campaign nationally and provide a final report.

### **State and Territory responsibilities**

The States and Territories agreed to implement the Campaign within the framework of local resources and/or by the recruitment of additional registered nurses to conduct the school-based clinics. All nurses were to receive specific instruction in Campaign requirements including the administration of MMR vaccine. They were also to receive cardiopulmonary resuscitation training and instruction in the recommendations of the NHMRC on vaccination (NHMRC 1997).

Specific responsibilities were to:

- provide parents or guardians with information on the benefits and risks of vaccination and obtain valid consent in relation to the vaccination of each child;
- vaccinate children, with parental consent, between the dates specified by the Commonwealth for the duration of the Campaign in the State or Territory;
- ensure compliance with the recommendations of the sixth edition of *The Australian Immunisation Handbook* (NHMRC 1997) in relation to the recording of vaccinations and the reporting of adverse events, for the vaccinations performed under the Campaign;
- provide a written record of vaccination (including date and batch number of the vaccine) for each child and retain the written consent in relation to each child for legal purposes;
- complete primary school data collection forms and forward these bi-weekly to the Commonwealth;
- contact the National Campaign Manager with the details of any adverse events as soon as possible and forward a written report within a week;
- provide a written report against the State/Territory strategic plan for the Campaign, within three months of the completion of the Campaign; and
- ensure that cold-chain requirements were met throughout the Campaign.

The Commonwealth began paying funds to States and Territories in March 1998 to enable State and Territory health departments to recruit and employ a State/Territory Coordinator. The Coordinators liaised directly with the National Campaign Manager and were responsible for the implementation of the Campaign in their respective jurisdictions.

The Coordinators were also required to prepare State/Territory-based strategic plans for implementation of the Campaign. These plans varied between jurisdictions, depending on existing vaccination programs and methods of recruiting nurses. In some States/Territories, this involved using local councils to conduct the vaccination clinics.

### **Involvement of general practitioners**

GPs were called upon to play several key roles in the Campaign. These roles included providing advice and support to parents with preschool, primary school and high school age children who were eligible for MMR vaccination, administering MMR vaccine to these children, and providing follow-up advice and care to children who may have experienced an adverse reaction to the vaccination. Some GPs were also involved in public relations activities associated with the Campaign such as being local media spokespersons or answering concerns regarding the safety and efficacy of vaccination.

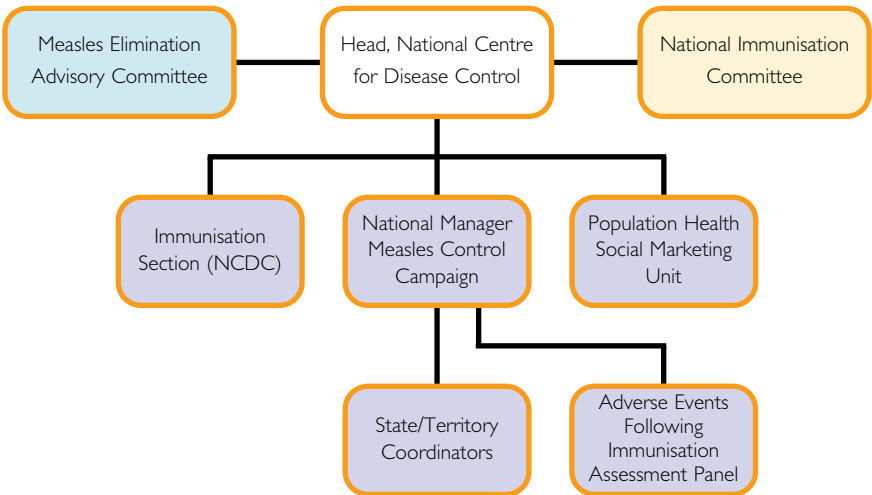
It was anticipated that most primary school age children would be vaccinated at school. The communication activities conducted during the Campaign encouraged parents to take their child to their local GP or other usual vaccination service provider if their child missed being vaccinated at school and to discuss any concerns or questions regarding the vaccination with them. In addition, some parents, particularly those with younger primary school age children, preferred to have their children vaccinated by their usual service provider rather than at school.

GPs and other vaccination service providers, such as local councils and child health nurses, were specifically targeted to provide the first dose of MMR vaccine to children aged 1-4 years who had not already received this vaccination and to provide a catch-up dose of MMR vaccine to children aged 12-18 years.

Administration of the Campaign

Figure 2.3 depicts the administrative arrangements and lines of reporting which were established to implement the Campaign.

Figure 2.3: Administrative framework for the Campaign





## Budget

A total budget of \$30.8 million was allocated to the Campaign, as shown in Table 2.1.

Table 2.1: **Campaign budget allocation**

Item	Allocation (\$)
Vaccine	11,948,750
Coordination/administration	735,000
Service delivery teams	5,096,740
Consumables	2,269,467
Other associated costs	441,399
Education campaign	10,000,000
Evaluation	100,000
Miscellaneous	250,000
<b>Total</b>	<b>30,841,356</b>

Funding for service provision was calculated on a team basis with each team comprising two registered nurses and one administrative assistant. The number of teams to be funded for each State and Territory was calculated by dividing the total number of children enrolled in primary schools in the State/Territory by 60 working days (total children to be vaccinated per day) and dividing again by 300 (number of children to be vaccinated by each team).

The total budget allocation for each State and Territory is given in Table 2.2.

Table 2.2: **Campaign budget allocation for States and Territories**

State/Territory	Allocation (\$)
New South Wales	2,130,678
Victoria	1,777,550
Queensland	1,547,640
Western Australia	834,602
South Australia	750,538
Tasmania	346,128
Australian Capital Territory	275,346
Northern Territory	275,346
<b>Total</b>	<b>7,937,828</b>

## 2.3 Consultation

Consultation with a wide range of stakeholders was integral to the planning and development of the Campaign in order to identify implementation issues and to encourage support for the Campaign.

### **Health departments and committees**

The members of the National Immunisation Committee were consulted and involved in the planning of the Campaign. The National Immunisation Committee oversees the *Immunise Australia Program* and is comprised of representatives of Commonwealth, State and Territory health authorities, general practice and NACCHO. State and Territory Health Ministers and Directors of Public Health/Chief Health Officers were advised of the proposed plan and implementation of the Campaign.

### **Education authorities**

The seventh Ministerial Council on Employment, Education, Training and Youth Affairs meeting in June 1997 supported the concept of conducting a measles vaccination campaign in schools.

Education authorities at every level, both government and non-government, were advised of the Campaign. Face-to-face consultations were held between March and July 1998, with education authorities and parents' groups in each State and Territory, to outline the Campaign and to discuss any concerns. State/Territory Coordinators were encouraged to liaise closely with the nominated contacts of these groups. The importance of frequent communication between State and Territory health and education departments was also highlighted.

All primary school principals were notified about the Campaign and given the contact details of their State/Territory Coordinator. School principals and some parent groups contacted the National Campaign Manager about the activities of anti-vaccination groups. These issues were managed by the individual State/Territory Coordinators.

### **Health professionals**

Consultations were undertaken with representatives of the Divisions of General Practice and the Royal Australian College of General Practitioners in the development of Campaign materials for GPs. The Australian Medical Association, Pharmacy Guild of Australia and the Pharmaceutical Society of Australia were formally briefed on the Campaign.

The Australian Nursing Council, the Australian Nursing Federation and the Royal College of Nursing were consulted about the Campaign strategy, with particular reference to the important role of registered nurses in the Campaign. These organisations facilitated the accreditation of the nurses in Queensland and Tasmania. The Australian Local Government Association was consulted about the service provision role by local councils in some States.

### **Peak organisations**

Face-to-face briefing sessions were held with a range of organisations (see Appendix 2).

### **Development of the consent form and supporting documentation**

During their development, the vaccination consent forms and supporting documents were submitted for focus testing with parents, teachers and principals. Discussion of the development of this documentation, including the consultation process, is given in Section 3.4.

## Communication and social marketing

To support the implementation of the Campaign, a comprehensive communication and social marketing strategy was developed. The strategy consisted of three major components of mass media advertising, direct marketing to parents and school principals, and public relations activities. The development and implementation of the communication and social marketing components of the Campaign are discussed in Chapter 4.

### Summary – Planning and development of the Campaign

- In planning the Measles Control Campaign, the Measles Elimination Advisory Committee was informed through reviews of measles elimination activities in other countries, consultation with international and national experts, and the commissioning of research into the seroprevalence of measles immunity within the Australian community and the feasibility of conducting a school-based measles vaccination campaign. A workshop of experts was held to discuss the logistical, funding and surveillance issues of a measles elimination campaign.
- A strategy for a Measles Control Campaign was developed to form the first stage of a longer-term strategy for measles elimination. The aim of the Campaign was to improve measles vaccination coverage rates in Australia in an effort to eliminate the transmission of the virus in the near future.
- The components of the Measles Control Campaign were:
  - to conduct a ‘mop-up’ Campaign by vaccinating on parental consent, all children in primary schools throughout Australia;
  - to conduct a ‘catch-up’ campaign of all preschool age children by encouraging parents and GPs to ensure that this cohort had received at least one dose of MMR vaccine; and
  - to encourage parents of high school age children to ensure that their children had received two doses of measles vaccine.
- Commonwealth and State/Territory responsibilities were decided and administrative arrangements including the budget determined. Strategic plans for implementation were prepared by each State and Territory. A total budget of \$30.8 million was allocated to the Campaign.
- Consultation with a wide range of stakeholders was integral to the planning and development of the Campaign in order to identify implementation issues and to encourage support for the Campaign. Extensive consultation was undertaken with education authorities, health departments, GPs, nurses and other health professionals, and peak organisations.

3

## Implementation of the Measles Control Campaign



The strategy developed by MEAC recommended that the Campaign offer measles vaccination to all children attending primary school throughout Australia.

This chapter discusses the implementation of the Campaign, including:

- the recruitment of the National Campaign Manager and State/Territory Coordinators to coordinate the Campaign, and specially trained registered nurses in each State and Territory to deliver the vaccinations;
- the conduct of school clinics, including the booking of clinics, the contents of the information packs sent to schools and the standard protocol for operation of the clinics;
- development of a standard consent form, which was subjected to extensive consultation and modified accordingly before distribution;
- supply and distribution of vaccine and specially designed packs of disposable items for use in the school clinics;
- data collection from every school, using a standardised collection form, which provided the dataset for part of the Campaign evaluation (discussed in Chapter 5); and
- adverse events reporting and the adverse events findings from the Campaign.

## 3.1 Appointment of staff

### National Campaign Manager and State/Territory Coordinators

In October 1997 a National Campaign Manager was appointed to coordinate the measles elimination program, in collaboration with MEAC and the NCDC. Specifically, the Manager was required to:

- liaise with key stakeholders involved in the measles elimination program;
- provide relevant and timely information to MEAC and the NCDC;
- develop and coordinate a network of State/Territory Coordinators for the campaign;
- develop and coordinate elements of the measles elimination program as determined by MEAC and the NCDC; and
- provide relevant reports to the NCDC and MEAC on these activities.

The Commonwealth provided funding of \$50,000 to each State and Territory for the employment of a State/Territory Coordinator before the Campaign. The role of these Coordinators was to ensure that the Campaign responsibilities of the States and Territories were fulfilled (outlined in Chapter 2, see page 13). Each State and Territory employed one Coordinator. In addition, the South Australian Coordinator was assisted by a team of three consultants and the Queensland Coordinator by three zonal coordinators.

The National Campaign Manager consulted extensively with the State/Territory Coordinators and assisted in the development of policies and protocols. As well as several face-to-face meetings, weekly teleconferences were conducted and the progress of the Campaign, the number of adverse events and incidents reported were discussed. This also proved a useful forum for resolving issues and developing strategies to address the activities of anti-vaccination groups.

## Recruitment and training of service delivery staff

The Campaign was conducted by specially trained registered nurses in all States and Territories. It is difficult to determine the exact number of nurses involved in the delivery of the primary school vaccination program as some staff were employed part-time or on a sessional basis, and others were either currently employed in the provision of vaccination services, such as Community Health staff whose positions were then 'back-filled', or were actively recruited for the Campaign.

The delivery of the Campaign varied from State to State. For example, Victoria used the services of its local councils who routinely conduct school-based clinics. In this instance, the councils were able to provide the bulk of the nursing staff, with the addition of a small number of agency staff. Queensland also used local councils to conduct the Campaign in some areas of the State, recruited staff for other areas and used Community Health and outreach staff for remote areas.

Queensland and Tasmania encountered difficulties with the training of staff, as no formal vaccination accreditation programs were conducted in those States. In Tasmania, the Nursing Board had not authorised nurses to undertake vaccination. The State/Territory Coordinator undertook training in another State and then, using the New South Wales 'Immunisation Accreditation for registered nurses' training course, accredited the recruited nursing staff to administer vaccinations for the Campaign only.

In Queensland, nurse immuniser training courses had not been accredited by the Queensland Nursing Council or the Rural Health Training Cooperative at the time of the planning phase for the Campaign. After long delays, accreditation courses were approved and held only weeks before the Campaign began. A medical officer was present while the nurses vaccinated children in the school clinics.

Due to the increased number of appropriately trained nurses needed for the Campaign, New South Wales, South Australia, Western Australia, the Northern Territory and the Australian Capital Territory conducted additional vaccination accreditation courses for nurses. Victoria tendered the school vaccination clinics to current regional vaccination providers.

## 3.3 School clinics

### Booking clinics

The State/Territory Coordinators started liaising with schools several weeks before the Campaign began. This included informing the principals of each primary school about the Campaign and negotiating how the Campaign would be conducted in each school. Initially a letter was sent to all primary schools from the State/Territory Coordinators, followed by letters and telephone calls to book dates for vaccination clinics. Schools were also sent a principals' information kit from the Commonwealth that included:

- a check list (indicating the sequence of events during the Campaign);
- teacher briefing notes;
- parent's letter template;
- contact list for State/Territory Coordinators;
- consent information fact sheets;
- measles information fact sheets (available in 13 languages other than English); and
- a measles information pack.

This kit also explained that the school would be sent measles information packs that should be distributed to all children attending the school. Parents received a specially designed A5-size envelope which contained a covering letter from the Federal Minister for Health and Family Services explaining the importance of the Campaign, the consent form and the *Measles Information Booklet*. The booklet provided information on measles, the vaccine to be used in the Campaign, contraindications to the vaccine, common reactions that might occur and what to do about them and a question and answer section. A summary of this information was translated into eight community languages.

The State/Territory Coordinators also provided information about the Campaign to all home-school associations within their State/Territory. Home-school children were encouraged to attend their usual vaccination clinic or family doctor to receive their MMR vaccination.

### **Implementation of school clinics**

Teams of accredited registered nurses conducted the school vaccination clinics during the Campaign. These teams varied in number and some teams were supported by an administrative assistant.

Before the scheduled vaccination day, schools were advised of the facilities required to conduct a clinic and how the clinic would operate. This enabled the school to be prepared for changes to class schedules during the school vaccination clinic. On vaccination day, clinics were conducted according to a standard protocol, with nurses checking the consent and identity of each child before delivering the vaccination.

To ensure that vaccines were transported and stored correctly, the vaccination accreditation course included education in vaccine cold-chain requirements.

### **Rural and outback clinics**

Special consideration was given to implementing the Campaign in rural and outback communities. Alternative delivery methods were instigated for children who lived in very isolated communities, such as travelling community health clinics, Aboriginal and Torres Strait Islander Health Services and the Royal Flying Doctors Service. The Campaign began early in some outback communities, to maximise vaccination levels among Aboriginal communities with high geographic mobility.

### **General practice**

Divisions of General Practice distributed Campaign information kits produced by the Commonwealth to all GPs. The kits informed GPs of the change to the MMR vaccination schedule and also included a background information paper on the Campaign and commonly asked questions related to the Campaign and MMR vaccination. GPs were asked to provide parents with additional information on the Campaign and the MMR vaccine as appropriate and also provide MMR vaccinations to children if their parents chose not to have their child vaccinated at the school clinic.

### **‘Mop-up’ clinics**

In Victoria, Queensland, South Australia, the Australian Capital Territory and the Northern Territory ‘mop-up’ clinics were conducted in instances when substantial numbers of children had been absent on the school vaccination clinic day.

### 3.3 Development of the consent form and Campaign information

There was national agreement for the development of a standard consent form for the Campaign. A review of existing vaccination consent forms was undertaken and a draft form was developed in consultation with the National Immunisation Committee, MEAC, NCIRS and staff employed in school-based vaccination programs. Each State and Territory sought legal advice on the validity of the form and the NSW Health Department trialed the form in high school-based vaccination clinics. The form was then submitted to three rounds of formal focus testing throughout Australia with parents of children in the target audience to assess its suitability.

South Australia subsequently chose to use a form which was consistent with the consent process in that State and which collected data on the reasons why parents declined to provide consent. There was some confusion when copies of this form were inadvertently distributed to a few schools in the other States and Territories. Several notices were sent to the State/Territory Coordinators to alert their staff to the different format and to ensure that valid written consent was obtained for each child. A copy of both forms is at Appendix 3.

Separate consent forms were also developed for some Aboriginal and Torres Strait Islander communities, designed by vaccination providers from these communities. One Community Health Centre in the Northern Territory developed a video that explained the Campaign, narrated by an Aboriginal Health Worker in the local language.

The *Measles Information Booklet* for parents was also developed in consultation with the National Immunisation Committee, MEAC and NCIRS and underwent three rounds of focus testing with parents. The Principals' Information Pack and teachers' Briefing Note were focus tested with principals and teachers across Australia and the contents refined accordingly. This consultation is discussed in more detail in Chapter 4.

### 3.4 Vaccine and disposable items

#### Supply

The only licensed measles-containing vaccine in Australia in 1998 was measles mumps rubella vaccine (MMR II) manufactured by Merck, Sharp and Dohme. CSL Ltd<sup>5</sup> was contracted by the Commonwealth for the purchase and distribution of 1.95 million doses of vaccine and syringes pre-filled with diluent.

Packs of disposable items were specially designed for the Campaign. These packs contained sufficient items to vaccinate 200 children, including hypodermic needles, absorbent towels, alcohol handwipes, alcohol swabs, cotton wool balls and a sharps container.

The use of syringes pre-filled with diluent for injection saved a great deal of time and was felt by States and Territories to be beneficial in a mass campaign of this nature.

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5 Formerly known as Commonwealth Serum Laboratories.



## Distribution

CSL Ltd distributed both the vaccines and disposable items throughout Australia, with a total of 2,620 deliveries over the Campaign period. The States and Territories commended CSL Ltd on the efficiency, professionalism and timeliness of the distribution process, which enhanced the conduct of the Campaign.

## 3.6 Collection of data

Standardised data collection forms were completed for each school at the time of vaccination. A unique identifying number was assigned to each school and information about the school, date of vaccination, and number of students vaccinated was recorded for the initial visit and any subsequent 'mop-up' visits.

The data collection form was developed in collaboration with the States and Territories, MEAC and the NCIRS. A copy of the form is at Appendix 4.

The forms were completed by the vaccination staff after each school clinic and sent to the State or Territory health department. Forms were faxed bi-weekly to the Immunisation Section of the Commonwealth Department of Health and Family Services for data entry. A report on the progressive totals was distributed to the State/Territory Coordinators and discussed at the weekly teleconferences.

After the Campaign, the entire database was transferred to the NCIRS for analysis as part of the formal evaluation of the Campaign. These data were used to compare final coverage estimates for the Campaign. Additional variables such as year/grade, postcode and date of vaccination were used for other analyses.

## 3.7 Adverse events

The importance of the notification of adverse events following vaccination by all health professionals, vaccination providers and parents was emphasised throughout the Campaign. Vaccination providers and health professionals were encouraged to notify adverse events according to *The Australian Immunisation Handbook* (NHMRC 1997) as follows:

- the occurrence of one or more of the following conditions within 48 hours of the administration of a vaccine:
  - anaphylaxis;
  - shock;
  - hypotonic/hyporesponsive episode; or
- the occurrence of one or more of the following conditions within 30 days of the administration of a vaccine:
  - encephalopathy;
  - convulsion;
  - aseptic meningitis;
  - thrombocytopenia;
  - acute flaccid paralysis;

- death; or
- any serious event thought to be associated with a vaccination, including hospitalisation.

The following protocol for reporting was established before the Campaign:

- reports of adverse events were forwarded by States/Territories to the National Adverse Events Reporting Scheme in the Commonwealth Department of Health and Family Services and the Australian Drug Reaction Advisory Committee (ADRAC), which is responsible for post-marketing surveillance of all drugs including vaccines in Australia;
- immediate serious adverse events were reported by teams of nurses conducting the school-based clinics on a daily basis to State/Territory Coordinators;
- all serious adverse events were notified by State/Territory Coordinators to the National Campaign Manager by telephone, with a written report provided within one week of the event; and
- GPs reported all adverse events by telephone to State/Territory Coordinators and/or ADRAC.

The follow-up of all adverse events following vaccination was undertaken by States and Territories according to normal procedures.

Definitions of adverse events and assessment of causality are given in Appendix 5.

## **Adverse Events Assessment Panel's report**

An independent expert panel was established before the Campaign started, to assess serious adverse events that were reported to occur following the administration of the MMR vaccine during the Campaign. The Panel comprised three paediatricians with a special interest in immunisation, two medical epidemiologists, and the National Campaign Manager. The panel classified the reported adverse events following vaccination according to modified definitions recommended by the Pan-American Health Organization (PAHO 1998) (Appendix 5). The Panel also assigned causality ratings to each adverse event according to a classification developed by ADRAC (see Appendix 5). Overall and individual adverse event rates for each adverse event were calculated by dividing the number of events by the number of doses of MMR administered during the Campaign.

The Panel only assessed serious adverse events that occurred within 30 days of the administration of an MMR vaccine given during the Campaign. Reports were collected from three sources and received up to 1 September 1999. Incomplete or uncertain reports were excluded.

The three sources of reports were:

- collection by State/Territory Coordinators from Campaign vaccine providers, parents and GPs, who were asked to report all significant adverse events that were possibly related to administration of the MMR vaccine;
- National Adverse Events Reporting scheme (reports were collated by the NCDC and published regularly in *Communicable Disease Intelligence*); and
- ADRAC, which receives reports from private practitioners, public health providers, hospitals, vaccine manufacturers, and vaccine recipients or their parents.

Reports were collated from these sources and duplicate reports excluded by using identifiers. It was not possible to identify duplicate reports that were collected from ADRAC as confidentiality restrictions do not permit personal identifiers to be provided with these reports.

## Results

A total of 124 adverse events were reported in children aged 4-13 years. Of these, 19 were reported to ADRAC, 32 to the National Adverse Events Reporting Scheme and 73 to the State/Territory Coordinators. There were four duplicate reports identified. Twenty-one syncopal reactions that did not require any medical attention were considered not serious and excluded. Following review of the adverse events by the panel, 10 reports were excluded from further analysis because three adverse events had onset dates missing (one parotitis and two rashes) and seven were assessed to have an unclear causality (Table 3.1).

**Table 3.1: Assessment of causality of adverse reactions associated with the Campaign**

Adverse events	Certain	Probable	Possible	Unclear	Total analysed (excluding unclear)
Allergic reaction	7	2	2		11
Anaphylaxis	1				1
Anaphylactoid reaction	6				6
Arthritis		1			1
Arthralgia		1	1	1	2
Fever			5	1	5
Encephalopathy			1		1
Hyperventilation	2	3			5
Local reaction	3				3
Lymphadenitis		1			1
Other reaction		6	4	2	10
Parotitis		4		1*	4
Pain				1	0
Rash	1	1	1	4*	3
Seizures			4		4
Seizures (febrile)			1		1
Severe local reaction	2				2
Syncope	5	3			8
Syncopal fit	19	2			21
<b>Total</b>	<b>46</b>	<b>23</b>	<b>20</b>	<b>10</b>	<b>89</b>

\* Two rashes and one parotitis had missing onset dates.

After subtracting the excluded reports, 89 reports were considered by the Panel. For the 1.7 million children vaccinated during the Campaign, the overall adverse event rate was 5.24 per 100,000 administered doses. This was lower than the rate of 14.9 per 100,000 administered doses reported during the United Kingdom campaign (Salisbury et al 1995). The rates of almost all of the individual adverse events reported were lower than those reported from the United Kingdom, except for the rate of seizures, which was slightly higher (Salisbury et al 1995). Table 3.2 gives the incidence rate of all classified events.

**Table 3.2: Adverse events associated with MMR vaccine**

Adverse event	No	Rate per 100,000 doses
Allergic reaction	11	0.65
Anaphylaxis	1	0.06
Anaphylactoid reaction	6	0.35
Arthritis	1	0.06
Arthralgia	2	0.12
Encephalopathy	1	0.06
Fever	5	0.29
Hyperventilation	5	0.29
Local reaction	3	0.18
Lymphadenitis	1	0.06
Other reaction	10	0.59
Parotitis	4	0.24
Rash	3	0.18
Seizures	4	0.24
Seizures (febrile)	1	0.06
Severe local reaction	2	0.12
Syncope	8	0.47
Syncopal fit	21	1.24
<b>Total</b>	<b>89</b>	<b>5.24</b>

There were no deaths reported resulting from the administration of the MMR vaccine during the Campaign and all the children who were reported to have had a serious adverse event following vaccination have recovered. It was not possible to follow-up nine children because their adverse events were reported by ADRAC, and their recovery status was classified as 'unknown' (two fevers, three parotitis, two rashes, one afebrile seizure and one measles-like illness).

Although 46 reactions were categorised to be certainly caused by the MMR vaccine, the majority of these were syncope, syncopal fits, local reactions, and allergic reactions that were short-lived, as shown in Table 3.1.

### **Allergic type reactions/anaphylactoid/anaphylaxis reactions**

Eleven allergic, six anaphylactoid and one anaphylactic reaction were reported. The combined rate for anaphylaxis, anaphylactoid and allergic reactions was 1.06 per 100,000 administered doses which is lower than the rate in the United Kingdom of 1.6 per 100,000 administered doses (Cutts 1996). The rate for the one anaphylactic reaction was 0.06 per 100,000 as compared to 1 per 100,000 in the United Kingdom (Salisbury et al 1995). It is possible that the anaphylactoid reactions that were treated with adrenaline by the school nurses averted more cases of anaphylaxis. This is a credit to the school nurses who recognised the seriousness of the reactions and treated the children promptly.

Adrenaline was administered to a total of 13 children, seven for immediate allergic reactions (six anaphylactoid and one anaphylaxis) and for six children without immediate allergic reactions (four syncope and two hyperventilation). There were no adverse effects of adrenaline in these children.

All but four of the allergic reactions occurred within one hour of administration of the vaccine and were classified as *certainly* caused by the vaccine. The anaphylactic reaction occurred three minutes after the child was vaccinated. Of the six anaphylactoid reactions, four children developed symptoms within five minutes of administration of MMR vaccine, one child developed symptoms after 15 minutes and another after 60 minutes.

Two children with anaphylactoid reactions were admitted to hospital while the remaining children with anaphylactoid reactions and the one with an anaphylactic reaction were treated in the hospital emergency department and then discharged. All the children recovered.

### **Neurological reactions**

There were four children reported with afebrile seizures, one with a febrile seizure and one with an encephalopathy. All of these reactions were considered to be possibly related to the MMR vaccine. The rate of febrile seizures was 0.06 and afebrile seizures 0.24 with an overall rate of 0.30 per 100,000 doses of MMR administered. This overall rate of seizures (febrile and afebrile) was slightly higher than the 1 in 600,000 reported in the United Kingdom (Salisbury et al 1995). The one case of encephalopathy/encephalitis was considered *possibly* related to the vaccine and its rate was 0.06 per 100,000 doses administered.

### **Syncope**

There were eight children reported with syncope that required medical attention (three were hospitalised, three were seen in an emergency department and two were seen by a doctor). There were many more reports of simple syncope in children who were reviewed by the State/Territory Coordinators. However, these reports were not reviewed by the Panel.

### **Arthritis and arthropathies**

Two cases of arthralgia and one case of arthritis were reported giving a rate of 0.12 and 0.06 per 100,000 administered doses respectively. The arthritis developed in a six year old child one day after MMR vaccine. This reaction was considered to be *possibly* related to the MMR vaccine. The onset of arthralgias in two children occurred five and fourteen days after the MMR vaccine was administered.

### **Parotitis**

There were four parotitis reactions reported, occurring at two hours, 24 hours, eight days and 10 days after receiving the MMR vaccine. All of the parotitis reactions were considered to be *probably* related to MMR vaccine. The rate of parotitis was 0.24 per 100,000 administered doses.

**Local reaction/severe local reaction**

There were three local reactions and another two severe local reactions reported. All of these reactions were considered to be *certainly* caused by the MMR vaccine and all of the children have recovered. The rate of this reaction was 0.3 per 100,000 administered doses.

**Lymphadenitis**

There was only one case of lymphadenitis reported, which occurred 21 days after receipt of the vaccine and the child has recovered.

**Other reactions**

Ten reactions were categorised as 'other reactions'. Of these, two children presented with a measles-like illness and four with a rubella-like illness, one had hallucinations and one was diagnosed as having hemiplegic migraine. In addition, one child had a late onset fever with headache and another child had fever and a stiff neck. All of the reactions categorised as 'other reactions' were considered to be *possibly* related to the MMR vaccine.

**Discussion**

The overall reported rate of adverse events was low. The Panel considered that this was due to the Campaign targeting school children, most of whom were receiving their second dose of MMR, rather than to under-reporting. The incidence of adverse reactions is expected to be lower for children receiving their second dose of MMR vaccine compared with infants receiving their first dose of MMR vaccine. The reactions reported in older children were probably mostly in those susceptible to the vaccine virus. As most of the data on adverse events relate to primary vaccination of infants, it was considered only appropriate to compare the rates from the Campaign to similar measles vaccination campaigns that provided the second dose of a measles-containing vaccine to similar aged children.

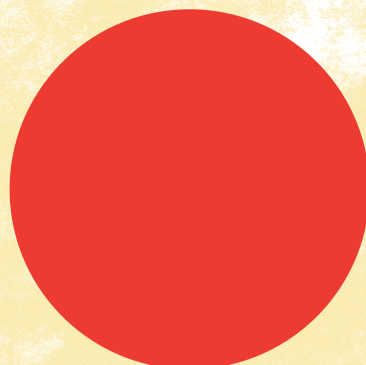
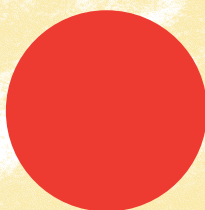
The aim of the Campaign was to avert an anticipated measles epidemic. Therefore the incidence of serious adverse events should be evaluated against the number of measles cases prevented through the Campaign. It is thought that the Campaign in Australia averted an estimated 17,500 cases of measles (NCIRS 1999). On comparing the risks and benefits of MMR vaccine, the benefits of this Campaign far outweigh the incidence of serious adverse events associated with vaccination.

### **Summary – Implementation of the Campaign**

- A National Campaign Manager and State/Territory Coordinators were recruited to coordinate the implementation of the Campaign and ensure that national and State/Territory responsibilities were fulfilled.
- Teams of accredited registered nurses conducted the school vaccination clinics in all States and Territories during the Campaign. Vaccination training and accreditation occurred in some jurisdictions to meet the demand for service delivery staff. The school vaccination clinics operated according to a standard protocol.
- Standard information materials, including a consent form, were developed for parents, providers, teachers and school principals. These materials were focus tested for suitability before being used in the Campaign.
- Standard data collection forms were completed by vaccination staff after each school clinic and forwarded through State and Territory health departments to the Commonwealth for data entry. Regular feedback on progressive totals was given to State/Territory Coordinators. After the Campaign, the database was transferred to the National Centre for Immunisation Research and Surveillance for analysis as part of the Campaign evaluation.
- General Practitioners provided significant support throughout the campaign by promoting the need for vaccination, responding to enquiries about the campaign, and vaccinating children whose parents chose not to have their child vaccinated at a school clinic.
- The importance of reporting adverse events following vaccination was emphasised throughout the Campaign. A panel was established to assess serious adverse events that occurred within 30 days of the administration of an MMR vaccine given during the Campaign. Reports were collected from three sources and received up to 1 September 1999.
- The reported rate of adverse events was low. Overall, 46 reactions were categorised to be certainly caused by the MMR vaccine. The majority of these were syncopal fits, syncope, local reactions, and allergic reactions that were short-lived. On comparing the risks and benefits of MMR vaccine, the benefits of the Campaign far outweighed the incidence of serious adverse events associated with vaccination.

# 4

## Communication strategy





The Campaign was supported by a communication strategy which aimed to increase parental awareness of the school-based program and encourage parents to give consent for their children to be vaccinated. The communication strategy was managed by the Population Health Social Marketing Unit of the then Commonwealth Department of Health and Family Services (now Health and Aged Care).

The extensive research conducted for the development and evaluation of the 1997 Immunise Australia community education campaign was critical in planning the Campaign. Background research was also undertaken to inform the development of Campaign materials and focus testing was carried out on materials, including the consent form.

As part of the strategic planning process, an evaluation strategy for the communication component of the Campaign was developed. The evaluation strategy involved a benchmark survey conducted before the implementation of the Campaign, daily continuous tracking surveys conducted over the five weeks of Campaign activity, and a final evaluation survey conducted after the final advertising had been completed at the end of the school-based vaccinations.

## 4.1 1997 Immunise Australia community education campaign

The 1997 Immunise Australia community education campaign aimed to increase the level of full age-appropriate vaccination in Australia. The primary target for the campaign was parents of children aged 0-6 years.

### Research

The development of the campaign was informed by a literature review of the role of parents and service providers in vaccination (Bazeley & Kemp 1994) and extensive qualitative research with parents (summarised in Carroll 1997). While most parents were found to support vaccination, many had not seen children suffering from vaccine-preventable diseases and underestimated the seriousness of the diseases on the recommended immunisation schedule. Associations with vaccination were often negative.

The research found that some parents were actively questioning the efficacy of vaccination and demanding comprehensive information, and that a small minority had actually rejected vaccination. The key motivators to vaccination were identified as emotional ones related to protecting children's health. Barriers to vaccination related to practical (eg difficulty in attending venues, remembering when vaccinations are due), medical (eg postponing vaccinations when a child is sick) and emotional factors (eg fear of adverse reactions to vaccines). The emotional barriers were the strongest of these.

## Implementation

The community education campaign principally involved advertising on television and in women's and parent magazines. The campaign comprised:

- two 60-second television advertisements showing the seriousness of vaccine-preventable diseases;
- magazine advertisements, which reinforced the television advertising and outlined the full immunisation schedule;
- an information booklet outlining the benefits and risks of vaccination;
- a poster, distributed through doctors' surgeries and health centres;
- Immunisation Days held at health centres and doctors' surgeries at selected locations across the country;
- measures to increase service providers' knowledge and skills, and to encourage the active promotion and provision of full age-appropriate child vaccination; and
- a multicultural marketing strategy targeting 12 language groups.

These activities were supported by continuing public relations activity to give detailed information on the risks of vaccine-preventable diseases, the benefits of vaccination, and common side effects of vaccination. The public relations strategy was successful in putting the issue on the public agenda and garnering significant editorial support for the campaign in metropolitan and regional media.

## Evaluation

The evaluation of the 1997 campaign involved pre and post-campaign telephone surveys, each conducted nationally with approximately 800 parents/guardians of children aged up to 6 years (Cramer & Carroll 1998).

Results indicated that the campaign effectively reached and communicated with its target audience. There was an increase in reported discussion about vaccination in the home, and a significant increase in the proportion of respondents reporting correct ages for vaccination. There was an increased perception of the seriousness of measles and other vaccine-preventable diseases and in the proportion of respondents who believed that a child not vaccinated against measles would catch measles.

Between the two surveys, the proportion of parents who reported they had checked their child's immunisation status in the last three months also increased (36 per cent to 43 per cent) as had the number of parents who reported they had taken their child to be vaccinated (22 per cent to 33 per cent). Overall, the study found that 99 per cent of parents in the target group supported vaccination, with 91 per cent strongly supporting it. The positive shifts in attitudes regarding childhood vaccination were seen to generally build upon the earlier achievements of a less intensive education campaign implemented in 1995, which achieved a more modest reach and behavioural outcomes (Research & Marketing Group 1996).

## 4.2 Research for the 1998 Campaign

The qualitative research and surveys from 1995 and 1997 provided extensive information on parents' knowledge, attitude and behaviour in relation to childhood vaccination in the 0-6 year age group. For the 1998 Campaign, a small qualitative research project was commissioned to investigate whether knowledge and attitudes to vaccination varied substantially between parents of children aged 0-6 years and parents of primary school age children. The project was conducted by a consultancy, Market and Communications Research, and involved focus groups with mothers (Market and Communications Research 1998a). The key aims of the research were to:

- undertake a preliminary assessment of parents' attitudes to a school-based program;
- identify the general level and nature of information about the program desired by parents;
- gain an initial reaction by parents to the proposed consent form; and
- assess the appropriateness of using the measles television advertisement from the 1997 Immunise Australia community education campaign in the proposed Campaign.

If the results of this small exploratory research project were not consistent with the previous research or identified new issues among parents of the older age group, a more comprehensive research project was to be considered.

### Results

The research project confirmed that knowledge and attitudes of parents of primary school age children were not dissimilar to those of parents of the younger age group. The school-based vaccination program was generally perceived to be a convenient, efficient and cost-free method of ensuring a child is protected from measles. The research indicated that parents in areas where there were already established school-based vaccination programs were more positively predisposed to the program.

The most compelling factor in a parent's decision to participate in the school program was found to be the desire to protect their child from measles. Parents generally accepted that measles can be a very serious disease. It was evident that the 1997 campaign had contributed to this perception, with many parents citing the television advertisements from that campaign.

### Knowledge

The research project found that there was low awareness of the necessity for a second dose of the MMR vaccine. Some parents confused the MMR vaccine with the DTP (diphtheria, tetanus, pertussis) vaccine which was being administered to 4-5 year olds before school entry, and considered that their child had already received their second MMR dose. Awareness of the rubella vaccine was high, and particularly associated with girls being vaccinated in their early teens. However, parents did not associate rubella with the second dose of MMR and measles.

Parents sought the following information:

- why the age for the second dose of the measles vaccine was being lowered;

- the consequences of children having missed their first dose, or having already had their second dose;
- how the vaccination clinics at school would take place, from a practical, logistical and safety viewpoint;
- how children would be prepared for the vaccinations and what monitoring procedures would be in place to check the children after the vaccination;
- alternatives for parents who did not wish their child to participate in the school program and whether it was possible to take their child to the family doctor; and
- what contingency plans were in place for school children who were away on the day and whether parents would receive a record that their child had been vaccinated as part of the program.

Some of these questions were an early indication that a proportion of parents may wish to attend their GP rather than participate in the school program. As a result, consideration was given in the strategy development phase to ensuring GPs were well informed about the Campaign.

Participants in the research project were given a sample consent form to consider. Generally, parents indicated they would sign the consent form, particularly if they could obtain satisfactory answers to their specific questions or concerns. Parents indicated they would seek further information from the telephone information number included on the consent form, and other people such as the school principal, the child's teacher, the local doctor and the local council health worker.

Parents provided useful comments for improvement of the design of the sample consent form. In addition, some parents also expressed a need for the use of less technical medical terminology, and a telephone number for parents who may require a translation.

While the advertisement from the 1997 campaign was well recognised by many parents in the groups, it was considered to be targeting parents of younger children, and was not seen to relate to the school-based vaccination programs in its existing format.

## 4.3 Strategic planning and development of materials

The results of the research project guided the development of both the advertising and direct marketing strategies for the Campaign. The research determined the need for an information-based campaign and identified what information parents would require to participate in the Campaign, highlighting the need for an information pack that outlined the rationale for the Campaign and the change in the vaccination schedule.

Based on these findings, a comprehensive social marketing strategy was developed in consultation with key stakeholders to promote the Campaign (DHFS 1998). The strategy identified the primary target audience for the Campaign as being parents of primary school age children (aged 5-12 years). Secondary target audiences were identified as parents of children aged 1-4 years who may have missed the 12-months MMR vaccination, and parents of high school age children (aged 12-18 years). Other secondary audiences identified for communication were vaccination service providers (including GPs and nurses)

and people in a position to provide information to parents about vaccination (eg child-care providers, pharmacists).

A complementary stakeholder management strategy was also developed to generate support from key stakeholders and to inform them of the details of the Campaign. The strategy was developed in recognition of the vital role of stakeholders in the successful implementation of the Campaign. Stakeholders were identified as principals of primary schools and high schools in Australia and peak bodies of schools (including independent school associations and parents' associations). In addition, a wide range of health organisations and associations, and State/Territory and Commonwealth government departments and bodies were considered to be key stakeholders for the purpose of the strategy.

## **Objectives of the communication strategy for target groups**

### **Parents of primary school age children**

The communication strategy sought to increase and reinforce positive attitudes to the school-based component of the Campaign as a positive health measure for children. It sought to promote vaccination as an appropriate way to care for children and as an important part of being a responsible parent.

The key objectives for parents of primary school age children were to raise awareness of:

- changes to the existing measles vaccination schedule;
- the fact that the Government would be implementing a campaign in all primary schools in Australia to ensure primary school children did not miss out on the second MMR vaccination; and
- the need for the use of a consent form signed by parents.

The behavioural objective was for parents to support the Campaign by seeking out and reading material about the Campaign, and ultimately signing and returning the consent form in order for their child to participate.

Among parents of primary school age children, special consideration was given to the development of a strategy targeting parents from non-English speaking backgrounds. An extensive advertising and public relations strategy was designed to meet the information needs of 13 non-English speaking background communities. The languages chosen for targeting were Portuguese, Arabic, Persian, Turkish, Cambodian, Chinese, Indonesian, Korean, Thai, Lao, Vietnamese, Samoan and Tongan. Selection of these languages was based on several factors including the number of children under 12 years in each language group, recency of arrival, and English proficiency of the language group.

### **Parents of children aged 1-4 years**

The main objectives for parents of children aged 1-4 years were to:

- raise awareness that a child not vaccinated against measles was at risk of contracting the disease; and
- inform parents that, if a child had missed their 12-month MMR vaccination, they would receive a reminder notice.

Consistent with objectives for parents of the older age group, the Campaign also sought to increase and reinforce positive attitudes towards childhood vaccination. The behavioural

objective for this target group was to review their child's vaccination status and to complete age-appropriate vaccination.

### **Parents of children aged 12-18 years**

Objectives for parents of children aged 12-18 years included:

- raising awareness that vaccination was an important issue facing parents of adolescent children;
- promoting positive attitudes to vaccination; and
- ensuring that adolescents received their second dose of MMR.

### **Vaccination service providers and information providers**

The main aim of communication with vaccination service providers and information providers was to promote awareness of the nature and scope of the Campaign and to encourage universal professional support and involvement in the Campaign. This would facilitate opportunistic vaccination of those children and adolescents not involved in the school-based program, and/or the provision of information to parents.

## **Communication development and refinement**

Based on the communication objectives for each of the target groups, an advertising brief was developed for Ogilvy and Mather, the advertising agency responsible for the development of advertising materials for the 1997 education campaign. A brief to develop materials for non-English speaking parents was developed for multicultural marketing consultants, Cultural Perspectives, and a series of communication briefs were developed for public relations consultants, Royce Communications. Both companies had also been involved in the 1997 campaign.

Building on the achievements of the 1997 campaign, the briefs specified that concepts should assume a sense of consumer support for vaccination and depict the school-based program of the Campaign as a normal part of school life. In addition, the communication materials were required to clearly deliver the facts relating to the Campaign, thereby addressing the information needs of parents as identified in the developmental research.

### **Materials targeting parents**

A four-stage communication plan targeting parents was proposed. The aims of the plan were to:

1. make parents aware that current measles vaccination levels were not adequate to protect their children and explain that the Government would shortly be introducing a measles vaccination campaign in all primary schools across Australia;
2. alert parents that their children would be receiving an information pack and consent form from their school and advise them that they would need to sign the form and return it so that their child could be vaccinated;
3. remind parents that they should have received the information pack and that they needed to sign the consent form and return it to the school to ensure their child would be vaccinated; and
4. make parents aware if their child missed their second dose of the measles vaccine via the school program, they could catch up through their local doctor or health clinic.

Three different campaign approaches were proposed, each including television advertisements corresponding to the four proposed stages. Supporting newspaper concepts and an information kit (including a consent form) to be distributed through schools were also developed.

Campaign materials and concepts targeting parents underwent three stages of evaluation and refinement.

The initial advertising concepts were evaluated through eight focus groups with parents of primary school age children (Market and Communications Research 1998b). The research indicated problems with the advertising strategy not achieving identification among its key target audience as follows.

- The approach found to be the most successful in communicating the intended message to parents was the one in which school situations depicted in the advertising reinforced that the Campaign was a school-based program and the wide diversity of children featured suggested that the advertising was intended for all parents. However, several components of this concept required refinement, including modifying some of the images that suggested to some parents that the program was only for Government schools.
- The initial newspaper concepts did not alert parents to the fact that there had been a change in the measles vaccination schedule that would affect all primary school age children, and were not strongly associated with school.
- Most components of the information pack were viewed positively, with an accepted rationale for the Campaign being provided and the information booklet meeting parental needs as identified in the developmental research.
- The draft consent form was found to be potentially confusing.

The advertising concepts and draft consent form were revised to address these points. The main challenge of the revisions was to simply and effectively communicate that the Campaign would potentially result in all primary school children being vaccinated against measles. This was achieved by combining the first two of the proposed four stages of the communication plan. The revised concepts were then tested in three focus groups (Market and Communications Research 1998b) with the following results.

- The revised television concepts were assessed as successfully communicating that the Campaign would target all primary school children, and the majority of parents felt that the advertisements were personally relevant to them. However, there was some confusion that the Campaign would be ongoing, with some parents thinking that their child may not be vaccinated at school for some years.
- The revised newspaper advertisements were more closely linked to the television advertising, and clearly indicated that the measles vaccination schedule had changed. They depicted children in school uniform, with a wider age range of children more representative of primary school. However, there was also the perception in relation to the newspaper advertising that the Campaign would be ongoing.
- The revised consent form was easily understood by parents, more clearly indicating which sections were to be completed by parents who wished their child to be vaccinated at school.

Once minor revisions had been made to the script to clearly communicate that the Campaign was a one-off program, production of the television advertisement and the

information pack began. Children aged 5-12 years representing a mix of socioeconomic status, gender, age and ethnicity were chosen for the television and print advertisements. All children involved had to have parental consent and provide their vaccination certificates.

When production was complete, a final research stage was undertaken to ensure that the final advertisements were consistent with the communication objectives (Market and Communications Research 1998c). Three focus groups were conducted. This research confirmed that parents perceived the main messages of the advertising, with parents responding positively to the advertising and being supportive of the Campaign. Based on respondent feedback, some minor production changes were made. The final images used for the newspaper advertising and information pack were recognised by parents as being closely linked to the television advertising, and achieved their information objectives.

### ***Materials for parents of non-English speaking backgrounds***

To assist parents from non-English backgrounds, the information booklet prepared for parents contained summary information about the Campaign in eight languages. The eight languages chosen were the larger language groups. In addition, two fact sheets in the 13 languages were prepared. One sheet provided information on the consent form and how it was to be completed, the other provided information on measles, the Campaign and the vaccine. These sheets were distributed to schools via two methods. A master copy of the sheets was included in the principals' information pack and the fact sheets were also distributed directly to schools in areas with high ethnicity. Print and radio advertising was developed in languages other than English using images and linkages to the mainstream advertising.

### **Principal and teacher materials**

As part of the stakeholder management strategy, an information pack was prepared for distribution to principals of primary schools. The pack outlined the rationale for the Campaign, the role principals would have, and included resource material which could be used for the promotion of the program within the school. Similarly, a briefing booklet was prepared for teachers. The principals' information pack was distributed in mid-June to give schools the maximum time to prepare for their vaccination days. A series of in-depth interviews and mini-focus groups were conducted with these target groups to assess whether the pack and booklet met their information needs and the materials were revised based on the feedback.

Ongoing consultations with State and Territory education and health departments were undertaken during Campaign development and implementation. Some direct mail activities to disseminate key information to principals were undertaken with the assistance of State/Territory education departments as specific issues arose.

### **Service providers**

Consultations were undertaken with representatives of the Divisions of General Practice and the Royal Australian College of General Practitioners in the development of the Campaign materials for GPs. A briefing session was also held with the Australian Medical Association. Members of the Australian Childhood Immunisation Charter (established as part of the Immunise Australia Program), were also valuable in spreading the Campaign's messages via their networks. Face-to-face briefings were held with the Pharmacy Guild, the Pharmaceutical Society of Australia, the Royal College of Nursing Australia, Australian Nursing Federation, Australian Nursing Council, and the Australian Local Government Association and these organisations were provided with comprehensive Campaign briefing kits. These organisations indicated their support for the Campaign during these consultations and undertook to disseminate information to their members throughout the Campaign.



## **Additional materials targeting parents and service providers**

### ***Website***

In line with the objective of providing information to parents in order to receive informed consent, an internet website was developed. BKM Ogilvy One were commissioned in May 1998 to design, host and maintain an Immunise Australia Program website. The website contained copies of all Campaign resources, including the consent form in a format that could be easily downloaded and printed. The site also contained information on the risks and benefits of vaccination, the current NHMRC immunisation schedule, information on common side effects of vaccination, and information tailored to the needs of vaccination service providers (including the Australian Immunisation Handbook). Throughout the course of the Campaign, additional information was posted on the site to meet emerging information needs.

During the course of the Campaign from July to November, there were approximately 7,000 user sessions for the site. This equates to approximately 50 user sessions per day. The average user session length was approximately seven minutes.

### ***Telephone information line***

A critical component of the 1997 community education campaign was the establishment of a telephone information line. The information line provided information to both the general public and vaccination service providers about vaccination and the campaign. Information was either provided verbally by trained information officers or through written materials that were mailed to the caller.

As part of the 1998 Campaign, information officers were briefed on how to answer queries in relation to the Campaign. If required, assistance was provided on how to complete the consent form. Additional information packs or resources for parents, teachers, principals and service providers could also be ordered through the line.

During the Campaign period, the telephone information line received over 17,500 calls. Over 11,000 calls to the line were from members of the public requiring additional information. Most of the calls were handled verbally with no further action required.

## **4.4 Implementation**

In April 1998 a public relations strategy targeting all key stakeholders in the Campaign was developed by the Commonwealth Department of Health and Family Services. This strategy was presented to the National Immunisation Committee in May for consideration and comment, and revised accordingly.

The Campaign was launched by the Minister for Health and Family Services on 9 July 1998, approximately three weeks before the first school-based vaccinations. The launch received comprehensive media coverage over the following two days, including evening news services. The Campaign was implemented in line with the three stages of the communication plan. The first two weeks of advertising involved raising awareness of the Campaign and the information pack containing the consent form. The third week of advertising reminded parents to return the consent form.

## **Parents of children aged 5-12 years**

National advertising began three weeks before commencement of vaccinations. Newspaper advertising for the Campaign involved full-page (or page dominant) advertisements in every State/Territory and major regional newspapers in Australia. Television advertising commenced with advertising spots in the Sunday night movie across all networks at concurrent times. The television advertising involved 400 Target Audience Rating Points per week with the expectation that 90 per cent of the target group would see the advertising at least once, and that 77 per cent of the target group would see the advertising three times or more. This was the heaviest media buy the Population Health Social Marketing Unit had ever purchased for a campaign.

The distribution of information packs coincided with the first week of school term after the school holiday period in the relevant State/Territory. In some States/Territories there were problems with the distribution of the pack. This was due to the inadvertent deletion of sections of some school mailing lists. This problem was detected by calls to the information line and State/Territory Coordinators by school principals. The continuous tracking study also detected that in some States/Territories the distribution of information packs was slower than anticipated.

## **Parents of non-English speaking backgrounds**

With some of the smaller language groups, where there was limited media infrastructure, an advocates strategy was implemented to complement advertising and direct marketing activity. The strategy involved advocates of vaccination from the language group visiting churches, temples, and social and cultural events to promote the Campaign. The advocates were also available for media interviews.

## **Parents of children aged 1-4 years**

Parents of children aged 1-4 years, who missed their first scheduled dose of MMR vaccine received a letter from the ACIR to inform them of the schedule change and remind them that their child was overdue for their first MMR vaccination. Parents were encouraged to take their child to their GP or local vaccination clinic to check their child's vaccination status or to receive a vaccination. In addition, some public relations activity was undertaken in parenting magazines and women's magazines reminding parents of the need to check their child's vaccination status and alerting them to the change in the measles vaccination schedule.

## **Parents of children aged 12-18 years**

A mailout of information to secondary schools was undertaken, asking principals to remind parents of teenage children of the need to check their child's vaccination status to ensure adolescents had received two doses of MMR vaccine in their life. High school principals were provided with an information kit which included a pro forma article for placement in the school newsletter. Parents were encouraged to update their child's vaccination with their local GP.

In addition, an information package was mailed to GPs which contained a poster for display in their surgeries to remind parents to check the vaccination status of their teenage children.

Further, an information package was provided to a range of youth-related organisations including football associations, netball associations and scouts and guides organisations to encourage them to disseminate information about MMR vaccination through their existing communication mechanisms to both parents and youth.

Some low key public relations activity was also undertaken in magazines targeting young woman. The activity highlighted the importance of MMR vaccination, in particular rubella vaccination, to their future reproductive health.

## **Community public relations**

A comprehensive public relations strategy was undertaken throughout the course of the Campaign. The public relations activity supported the advertising strategy by providing detailed information to the target audience through a range of communication channels. This strategy included the development of a spokesperson register and a communication protocol to ensure timely and consistent responses from Campaign spokespeople. The register ensured a range of expert voices were available for the media to discuss the Campaign, including international experts from the WHO. The strategy of offering spokespeople to the media on a regular basis ensured the issue remained on the public agenda throughout the course of the Campaign. In addition, extensive media briefing and liaison resulted in high levels of positive reporting of the Campaign.

The public relations strategy also included a series of media events to provide an angle for the media to report the Campaign:

- the official launch of the Campaign;
- the distribution of the information packs;
- the start of the school-based vaccination clinics; and
- the announcement of the results of the Campaign.

All events were attended by the Minister for Health and Family Services and were successful in generating national media interest in the Campaign and sustaining it over a five month period. To support each of these activities, comprehensive media briefing kits were developed which included media releases, ministerial speeches, a detailed question and answer casebook, pictures of primary school children and video news releases, produced to assist the television media with footage for news bulletins. The latter were particularly successful with regional media outlets that were unable to have representation at the media events in order to take their own footage.

An additional component of the public relations strategy was a local media program of activity which consisted of the provision of regular stories to regional and suburban media outlets about the implementation of the Campaign in their region. Some examples of the publicity angles provided were photos of the first school children vaccinated as part of the Campaign, regular progress reports on the implementation of the Campaign in the local area, reminders that the clinics were being held in the local area at a particular time, and results of the Campaign on a regional basis. This strategy enabled the national Campaign to have a very local focus and as such increased the personal relevance of the communication activities with the target audience.

Table 4.1 provides a summary of the number of articles that appeared in the print media during the course of the Campaign and the proportion of the articles that were positive.

Table 4.1: **Campaign print media coverage**

Month	Articles	Per cent of positive articles
July	39	92.3
August	90	80.0
September	34	79.4
October	22	77.3
November	135	94.8
December	13	100.0
<b>Total</b>	<b>333</b>	<b>87.3</b>

Source: Public Health Media Unit, Commonwealth Department of Health and Aged Care.

## Issues management

An issues management strategy to monitor and develop responses to anti-vaccination activity and other issues was implemented.

Letters to the editor columns were anticipated as a preferred tactic of the anti-vaccination lobby as this forum enables a message to be promoted in an unedited form. Based on previous experience, a decision was made to limit the number of responses to these letters to avoid 'letter writing wars' as prolonged correspondence would leave an impression in the reader's mind that the two sides of the vaccination debate were equally valid, thereby lending credibility to the opposing argument.

All decisions to respond to anti-vaccination letters to the editor were made in consultation with the Minister's Office, the Population Health Media Unit, Population Health Social Marketing Unit, the State/Territory Coordinators and State Health Media Units. It was considered an appropriate strategy that the Commonwealth was given first right of reply on issues directly relating to the Campaign.

Anti-vaccination lobby groups started distributing a standard letter to editors in the first week of the Campaign. In August, a letter was sent by the Head of NCDC, to counter most of the allegations made by the anti-vaccination lobby in their generic letter. This syndicated letter was aimed at providing one voice of authority in response to the anti-vaccination lobby's claims and had an immediate effect in stemming the flow of misinformation. In September, anti-vaccination lobbyists stepped up their letter writing to include new letters largely relating to proposed legal action against the Commonwealth in relation to the Campaign. Due to the threat of the impending legal action, the Commonwealth was advised not to respond to these letters.

The Department enlisted the support of various high profile vaccination advocates, including the Australian Medical Association, Rotary International and the Deafness Foundation, to write general letters in support of vaccination. The media embraced these letters as 'voices of reason' in the vaccination debate and as such these letters had high take-up rates.

For areas of particularly high anti-vaccination activity a separate ‘hot spots’ strategy was developed. This strategy involved extensive liaison with media outlets running anti-vaccination stories and the provision of positive information and stories to these media outlets throughout the course of the Campaign. The rationale for this localised strategy was to ensure that any negative publicity was not given wider media attention or a national platform for debate. On a number of occasions in consultation with State/Territory health departments and the State/Territory Coordinator, local GPs were nominated as media representatives which proved to be an effective strategy. Further, some GPs took the initiative to approach media outlets themselves to speak against anti-vaccination claims.

It is useful to note that the target audience was receiving information on the Campaign from a range of sources, not just letters to the editor. The effectiveness of this strategy is highlighted by the fact that most positive media coverage occurred in mass media channels, particularly television, metropolitan daily newspapers and mass audience talk back radio, reaching a far greater audience than the letters to the editor which appeared largely in suburban papers.

Table 4.2 summarises the number of letters that were positive and negative to the Campaign that appeared in newspapers during the course of the Campaign.

**Table 4.2: Number of letters to the editor that were positive and negative in relation to the Campaign**

Month	Positive letters	Negative letters
July	3	7
August	25	22
September	4	9
October	7	1
November	6	2
December	1	1
<b>Total</b>	<b>46</b>	<b>42</b>

Source: Public Health Media Unit, Commonwealth Department of Health and Aged Care.

It can be seen that the Department’s issue management strategy was effective in addressing the misinformation disseminated by the anti-vaccination lobby.

## Communication strategies for GPs and other vaccination service providers

The strategy included the use of Divisions of General Practice and specialist medical media to disseminate information about the Campaign to GPs. The National Immunisation Committee expressed concern that the strategy did not include direct mail activity to all GPs and the strategy was therefore refined to include a range of direct mail activities.

Throughout the development and implementation of the Campaign the National GP Immunisation Coordinator provided advice on the development of Campaign elements as

did a range of other vaccination service provider representatives including representatives of the Royal Australian College of Nursing, Australian Nurses Federation and the Australian Local Government Association.

A mailout to GPs occurred shortly before the launch of the Campaign and in the middle of the school-based vaccination period. In addition, from June to December monthly articles were distributed to all medical specialist media for inclusion in their publications. There were five substantial articles in *Australian Doctor*, relating to the changes to the measles vaccination schedule and the Campaign. Further, there was significant take up of these articles in Division of General Practice newsletters. The *Friday Fax*, a communication vehicle of the Royal Australian College of General Practitioners, was used on a number of occasions to inform GPs of current issues in the Campaign.

Information was disseminated via a range of communication channels, to ensure that all vaccination providers were: well informed about the Campaign; aware of the schedule change; equipped to answer questions from parents about the Campaign; and informed of the impact of the Campaign on their remuneration through the General Practice Immunisation Incentive scheme. For the duration of the Campaign, articles and media releases were sent monthly to medical media including *Australian Doctor*, *Medical Observer*, *Modern Medicine*, and to Divisions of General Practice, Royal Australian College of General Practitioners faculties, State-based Organisations and branches of the Australian Medical Association to ensure that GPs were kept well informed of the progress of the Campaign.

## 4.5 Evaluation

### Benchmark survey

Before the launch of the television advertising on 9 July 1998, a quantitative survey of 490 interviews was conducted with parents of primary school children. The purpose of the survey was to establish levels of knowledge, attitude and behavioural intention in relation to the MCC before the implementation of the communication strategy. The benchmark research was also used to inform last minute tactical decisions about the conduct of the Campaign. Due to the fact that no survey research had been conducted at the development stage because of time constraints, the results of the benchmark research provided the first quantitative estimate of the proportion of parents who would provide consent for their children to participate in the Campaign. The survey was conducted by the Wallis Consulting Group (Wallis Consulting Group 1998).

### Methodology

The sample design for the benchmark survey was influenced by the design of the overall research program for the evaluation of the communication component of the Campaign. In the benchmark survey, decisions were made with respect to total sample size and quotas for individual State and Territories in order to meet the continuous tracking objectives and keep within the designated evaluation budget.

A stratified quota sampling methodology was used for the benchmark survey. A quota of 98 respondents was set for five geographic regions (Western Australia; Queensland; South Australia and the Northern Territory; New South Wales and the Australian Capital Territory; and Victoria and Tasmania) with 28 of the interviews in each region conducted with respondents from non-metropolitan areas. Households were randomly chosen within these

strata using a list derived from the CD ROM White Pages. These households were then contacted and it was established whether any children aged 5-12 years were living in the household. If this was the case, the person in the household mainly responsible for the health care of the child was interviewed. Several other screening questions established whether 5-12 year olds were currently attending a primary school (or kindergarten in New South Wales). The average interview length was approximately 15 minutes.

Due to the disproportionate sampling methodology adopted for the survey, the results of the survey were weighted to population parameters established from the ABS Family Thematic Profile, based on the 1996 Census of Population and Housing.

## Results

When asked whether they were aware of any new government health initiatives or campaign specifically relating to children's health, 3 per cent of parents reported the Campaign. When asked whether they were aware of the government starting a new campaign designed to help reduce the number of children who catch measles, this proportion increased to 33 per cent.

After hearing details of the Campaign, 93 per cent of parents reported that they supported the Campaign (76 per cent 'strongly' supported). A further 5 per cent were neutral to the Campaign. Parents were asked whether they would or would not provide consent for their children aged 5-12 years to be vaccinated against measles at school as part of the Campaign. As summarised in Table 4.3, approximately 84 per cent of parents indicated they would provide consent. Reasons for not providing consent are also summarised in Table 4.3.

Table 4.3: **Whether parents would provide consent and reasons for not consenting**

	Per cent (n=490)
Would provide consent for the Campaign	83.5
Would take to GP	4.3
Believe child has already received second MMR	5.1
Child has already had measles	0.3
Would require more information	3.4
Don't know	2.3
Disagree with vaccination	1.1
<b>Total</b>	<b>100.0</b>

Consistent with research previously conducted with parents of children aged 0-6 years:

- 96 per cent of parents of primary school children in the benchmark survey indicated that they supported vaccination and 85 per cent of respondents indicated that they 'strongly supported' vaccination;
- 89 per cent of respondents were aware that children currently received their first vaccination for measles at 12 months, but only 46 per cent were aware that the second vaccination was given between 10 and 16 years;

- 83 per cent of parents believed 'it would be serious to a child's health if they caught measles', 77 per cent believed 'measles can cause serious complications including pneumonia and inflammation of the brain' and 75 per cent believed 'a child can die from measles'.

The benchmark research found that the main concern parents had about the Campaign was 'the level of hygiene of school vaccinations'. Approximately one-third of respondents indicated a high level of concern with this issue.

In the absence of a quantitative phase of developmental research, the benchmark research confirmed the strategic rationale of the communication component of the Campaign.

## **Continuous tracking**

As the duration of the media schedule for the Campaign was short (three weeks in the initial stages) with a relatively high media weight, daily tracking of the advertising was implemented to monitor the impact of the Campaign as part of a risk management strategy. Before the benchmark survey there were no population estimates in relation to the target group's attitude to the Campaign and its elements. As outlined earlier, only qualitative research had been conducted to guide the developmental phase. If after the Campaign launch there had been negative reaction to the Campaign, or one of its components, a strategy needed to be implemented immediately to address the problem. Continuous tracking was considered to be an effective way to monitor implementation measures, particularly the reach of communication elements. Results from nightly surveys were reported to the Department the following morning allowing strategic communication decisions to be made on a daily basis during the implementation phase.

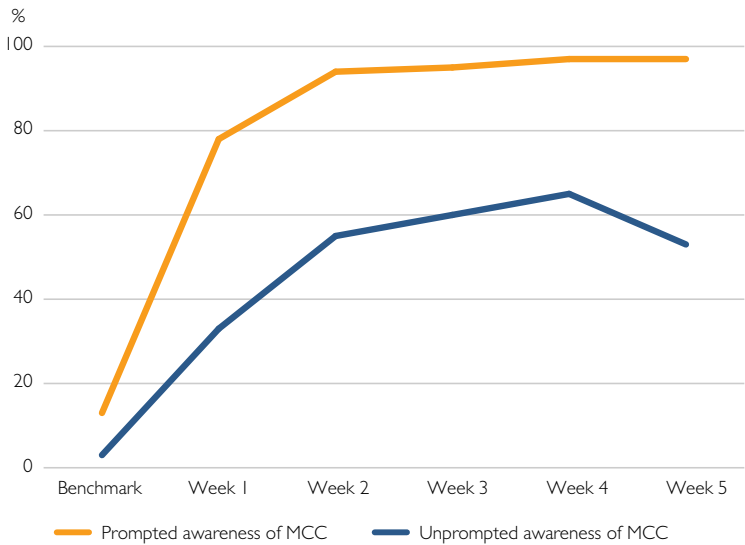
The tracking survey involved 70 interviews with parents of children in the target group per night for four weeks. Quotas were set at 14 interviews per night in each of the five geographical regions, with four of the interviews in each region conducted in non-metropolitan areas. Results of the previous night's survey were reported daily. At the end of the fourth week, 99 per cent of the target group reported they were aware of the Campaign but only 87 per cent reported that they had seen the information pack. It was therefore decided to undertake a final stage of tracking in the fifth week. The final stage involved 210 interviews on 12 August resulting in a total of 2,184 continuous tracking interviews.

The tracking survey adopted the same screening questions as the benchmark survey and the data were weighted according to the same population parameters. The tracking survey aimed to determine levels of awareness of the Campaign and the Campaign elements, knowledge of the Campaign, attitudes to the Campaign and behaviour in relation to the Campaign. Results were as follows.



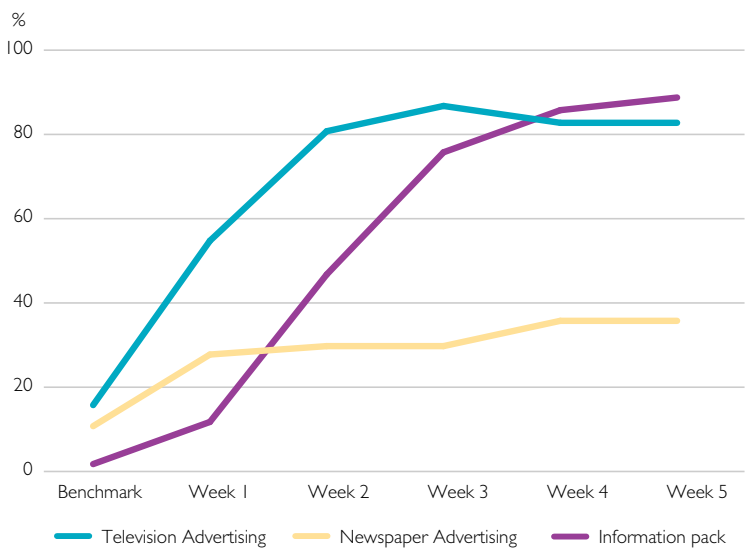
- Campaign awareness** – the survey showed increases in both unprompted awareness and prompted awareness of the Campaign (see Figure 4.1).

Figure 4.1: **Awareness of the Campaign**



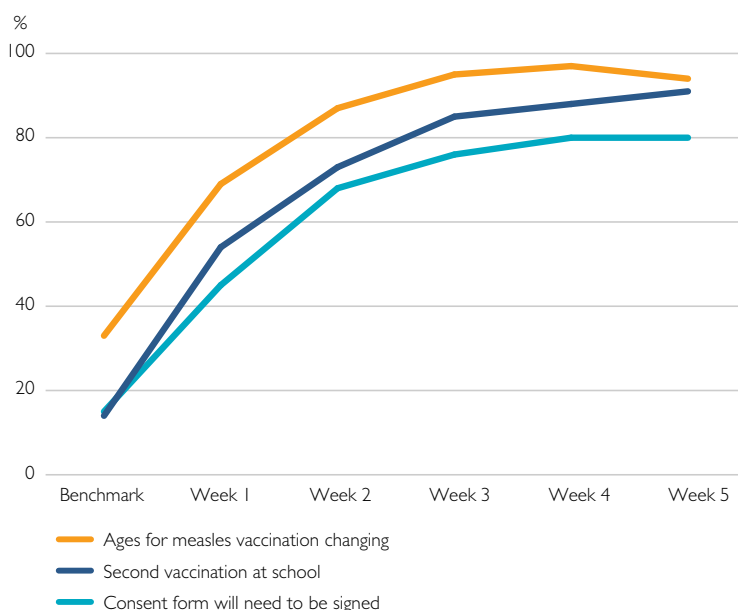
- Awareness of communication elements** – to establish reach of the individual advertising and direct marketing elements, parents were asked whether they had seen each of the communication components (prompted recall) (Figure 4.2).

Figure 4.2: **Prompted awareness of the communication elements**



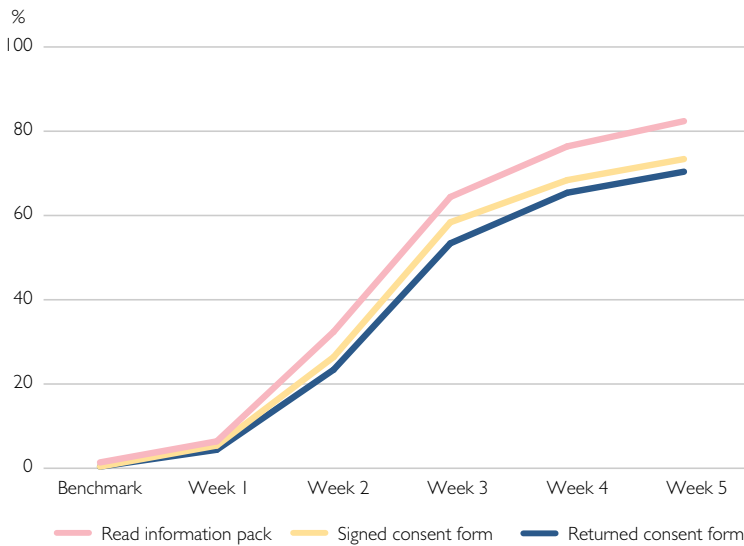
- **Knowledge** – parent knowledge concerning the change in age for measles vaccination, the school-based measles vaccination program, and the need for parents to sign a consent form improved in the Campaign period (Figure 4.3).

Figure 4.3: Increase in knowledge in relation to the Campaign



- **Attitude** – attitudes toward the Campaign and vaccination were generally stable, with 95 per cent of respondents supporting the Campaign, 81 per cent strongly supporting the Campaign, 97 per cent supporting childhood vaccination, 87 per cent strongly supporting vaccination, and 1 per cent opposing the Campaign and vaccination. The most frequently mentioned concern in the benchmark survey was the level of hygiene of school vaccinations. The proportion of parents reporting concerns about the level of hygiene of school vaccinations decreased from 33 per cent in the benchmark to 18 per cent in Week 2 of the tracking, and remained relatively stable thereafter.
- **Behaviour** – to measure behaviour in relation to the Campaign, respondents were asked whether they had read the information pack, signed the consent form, and returned the consent form to school. The proportions of parents reporting each of the behaviours increased over the tracking period (Figure 4.4). By the final week of tracking, 82 per cent of parents reported reading the information pack, 73 per cent of parents reported signing the consent form and 70 per cent had returned it to school. Further questions revealed that of those who had read the information pack, 92 per cent rated the pack as informative (60 per cent rated it ‘very’ informative).

**Figure 4.4 Behaviour in relation to the Measles Control Campaign**



### Evaluation survey

School-based vaccinations took place between the beginning of August and the end of November. The final stage of the advertising, which aimed to encourage parents whose children were not vaccinated as part of the Campaign to arrange for their child to be vaccinated at their GP or health centre, ran during the week beginning 15 November. To assess this stage of advertising and to estimate the effectiveness of the Campaign against its objectives, a final evaluation survey was conducted in the last week of November by the Wallis Consulting Group (Wallis Consulting Group 1999).

The survey involved 1,215 interviews with parents in the target group. Approximately 240 interviews (of approximately 15 minutes) were conducted in each of the five previously defined geographic regions, with 70 interviews in each region in non-metropolitan areas. The evaluation survey used the number of eligible children covered by the 1,215 interviews as a base, resulting in a total base of 1,917 children for analysis, due to the fact that more than one eligible child could be found per household (or interview).

As with the benchmark and tracking surveys, the data was weighted to the population parameters established from the ABS Family Thematic Profile. In addition, survey estimates for child-level data were weighted to reflect the actual distributions of 5-12 year olds across the sampled regions.

## Results

The evaluation survey found that 37 per cent of parents reported seeing advertising about the Campaign on television in the previous week. Of these, 71 per cent reported the message as 'parents should arrange for their child to be vaccinated if the child missed out on the Campaign'.

The survey established whether each child had been vaccinated at school as part of the Campaign or anywhere else other than school since May (when publicity about the change in schedule started in earnest). Results are summarised in Table 4.4. Parents reported that 79 per cent of children had been vaccinated at school as part of the Campaign. An additional 11 per cent of children had been vaccinated elsewhere (eg at doctors' surgeries) during the course of the Campaign. Taking into account an additional 4.5 per cent of children whose parents believed they had already received a second MMR vaccine before the Campaign, this resulted in a potential rate of protection against measles of 94 per cent.

**Table 4.4: Vaccination outcomes achieved as a result of the Campaign**

	Per cent (n=1,917)
Immunised as part of the Campaign	79.0
Immunised elsewhere	10.6
Child received second MMR before the Campaign	4.5
Child has already had measles	0.1
Sub Total: Potentially protected against measles	94.2
Plan to immunise in the future	4.4
No plans/undecided	1.5
<b>Total</b>	<b>100*</b>

\*Does not sum to 100 per cent due to rounding.

The results of two independent studies conducted by the NCIRS found consistent results (further discussed in Chapter 5). One study involving blood tests after the Campaign of approximately 1,000 primary school age children found that 94 per cent were protected against measles. Another survey of 1,844 parents using a WHO cluster sampling method found that 80 per cent of children were vaccinated at school and 11 per cent vaccinated elsewhere. This resulted in 96 per cent being protected after taking into account 4 per cent vaccinated against measles outside the Campaign time period.

Further analysis of the evaluation survey data revealed that five year olds were the least likely to have been vaccinated at school (64 per cent) and most likely to have been vaccinated elsewhere (24 per cent). The main reason given for why children were not vaccinated at school was because parents preferred a GP or other health practitioner to conduct the vaccination.

The evaluation survey also found that children from homes where a language other than English was spoken were more likely than other students to have been vaccinated at school (91 per cent vs 78 per cent) and more likely to have been vaccinated at all against measles at school or elsewhere during the Campaign (95 per cent vs 89 per cent). This would suggest the strategy targeting people from non-English speaking backgrounds was successful.

In the evaluation survey, parents who had a child vaccinated as part of the Campaign were asked to rate their level of satisfaction with the Campaign. In total, 96 per cent of this group reported they were satisfied with the Campaign (64 per cent reported they were 'very' satisfied).

### **Principals' survey**

In December 1998, a survey was conducted with principals of 463 government and private primary schools (Royce Communications 1998). In the survey, 95 per cent of principals reported that they had received the principals' information pack in a timely manner. The survey also found that 94 per cent believed the vaccinations went 'very smoothly' on the day and 94 per cent indicated they would be very likely to support any future school-based vaccination programs.

## **4.6 Conclusions**

Results of the evaluation indicate that the communication strategy was successful in meeting its objectives. Awareness of the Campaign and its key message of needing to sign a consent form increased in line with the launch and implementation of the communication activity, both peaking at 97 per cent. The information pack and the television advertising had the highest reach of the Campaign elements with up to 88 and 86 per cent of the target group reporting awareness of these elements respectively, at some stage during the tracking. Recognition of the television advertising (86 per cent), was consistent with the planned media weights (expected reach of 90 per cent).

The awareness of the Campaign and its elements translated into consent being given for vaccination. By the end of Week 5 of tracking, 73 per cent of parents in the target group had provided consent. By the end of the Campaign in November, parents reported that 79 per cent of children had been vaccinated at school as part of the Campaign and an additional 11 per cent had been vaccinated elsewhere. This resulted in a total of 90 per cent of children being vaccinated during the course of the Campaign, and a potential rate of protection against measles of 94 per cent when taking into account those vaccinated outside the Campaign period.

The effectiveness of Campaign communication components was consistent with the formative research process. That is, formative research was used to assess and refine the communication of key messages. This was possibly most clearly shown through the almost universal recognition among the target audience of their need to sign a consent form for their children to participate in the Campaign.

The very high level of participation in the Campaign could also suggest that parents' emotional concerns regarding vaccination in general, and the school program specifically, had been effectively addressed within the development of Campaign materials and implementation of Campaign activity. This was illustrated in the case of the key parental

concern about the level of hygiene of school vaccinations. Those expressing concerns reduced from one in three parents before the Campaign to one in five parents by Week 2 of the Campaign.

In the benchmark research, 83.5 per cent of respondents indicated they would provide consent for their child to participate in the Campaign. In the evaluation survey, 80.4 per cent of households indicated that at least one child in the household was vaccinated as part of the Campaign. This would suggest that the benchmark survey was a good predictor of the final outcome. These two proportions are not statistically different at a 95 per cent confidence level.

Continuous tracking research proved invaluable to the implementation of the Campaign. In the absence of quantitative developmental research, continuous tracking methodology provided a mechanism for identifying and managing risk associated with the implementation of the Campaign. The positive results from the tracking exercise gave confidence that the communication strategy was being implemented in line with the Campaign objectives and also allowed response to any problems at a time when corrective action could still be taken. The tracking surveys confirmed problems associated with the distribution of the information pack and provided a vehicle to contest the concerns being generated by anti-vaccination organisations about the comprehension of the consent form.

The contribution to the success of the Campaign from previous national campaigns should also be recognised. The extensive information and strategic insights generated from the research of the 1997 and the earlier 1995 national community education campaigns greatly facilitated the development of the communication strategy and materials for the Campaign. It is doubtful that the Campaign would have been as successful if the 1997 community education campaign had not preceded it. As outlined earlier, while the 1997 campaign achieved increases in knowledge and reported behaviour about full child vaccination, there were also achievements for measles vaccination. The increased perceptions of susceptibility to measles if a child is not vaccinated and the seriousness of the consequences of measles can be seen to have provided a degree of momentum and climate of support for the implementation of the Campaign. Consistent with agenda setting theory (McCombs & Shaw 1972), the increased salience of vaccination issues as a result of the cumulative impact of the serial high profile community education campaigns, could also be seen to have contributed to the success of the Campaign.

Finally, at a practical level, the fact that the Campaign was being delivered in the school setting also removed some of the barriers to vaccination such as time, transport and knowing when to have the vaccination, identified in the developmental research for previous campaigns.

### **Summary – Communication strategy**

- The communication strategy was a highly successful component of the Campaign. It was built on the work of previous community education campaigns in 1995 and 1997. Following social marketing principles, there was extensive formative research and developmental research before and during the development, testing and refinement of the communication strategy. Continuous tracking methodology during the Campaign provided a mechanism for identifying and managing risk associated with the implementation of the Campaign.
- The post-Campaign parent survey showed that 96 per cent of parents who had a child immunised as part of the Campaign were satisfied with the Campaign.
- Awareness of the Campaign and of the need to sign a consent form both peaked at 97 per cent during the Campaign.
- The information pack and the television advertisements had the highest reach of the Campaign elements, with up to 88 per cent and 86 per cent of the target group reporting awareness of these elements during the Campaign.

# 5

## Outcomes evaluation





An integral part of the Campaign was the evaluation component, to assess both the reach and coverage of the Campaign. The evaluation was undertaken by the NCIRS. This chapter discusses the evaluation of the primary and preschool interventions, an analysis of ACIR data on vaccination coverage, and the results of pre and post-Campaign serosurveys.

## 5.1 Evaluation of the primary school intervention

Evaluation of the primary school intervention comprised:

- estimation of the overall vaccination coverage of children aged 5-12 years using the real time data collected during the Campaign; and
- two national post-Campaign surveys:
  - a random sample of school Campaign Coordinators to identify school characteristics associated with vaccination coverage; and
  - a random sample of parents to make an independent assessment of coverage and to determine parental attitudes towards the school-based Campaign.

### Vaccination coverage using data collected during the Campaign

This study aimed to determine the MMR vaccination coverage of primary school age children vaccinated at school. Standardised data collection forms were completed for each school at the time of vaccination recording the total number of students in each year/grade, the number of consents returned and the number of students vaccinated. Completed forms were collated at State/Territory level then faxed weekly to the Commonwealth Department of Health and Family Services.

Vaccination coverage was calculated as the number of students vaccinated divided by the total number of primary school students. The denominator data used by the Commonwealth were derived entirely from the standardised data collection forms completed at the school at the time of vaccination. Coverage data were then analysed by: region (rural or metropolitan); year/grade; and date of vaccination.

Analysis of data collected was performed using Excel and SAS (version 6.11), with 95 per cent confidence intervals calculated where appropriate. Pearson's chi-square tests were used to test for differences and p values less than 0.05 were considered statistically significant.

### Demographic characteristics of participating schools

A total of 8,783 schools with a combined population of 1.78 million eligible children aged 5-12 years participated in the Campaign. It was not possible to estimate the number of schools which did not take part in the Campaign. The schools included primary, combined primary/high schools and special schools; however, only age-appropriate children were included in the analysis.

The number of schools from each State/Territory taking part in the Campaign was proportional to State/Territory population size. The majority of schools were from New South Wales (31 per cent), Victoria (25 per cent) and Queensland (18 per cent). Less than 4 per cent of schools were from the Northern Territory and the Australian Capital Territory combined. State/Territory identification was missing for 0.1 per cent of schools.

Forty-eight per cent of schools were categorised as metropolitan and 45 per cent were from rural areas. The remaining 7 per cent of schools were unable to be classified. The majority (63 per cent) of schools had between 36 and 400 students. The demographic characteristics of participating schools compared closely to those published in the *ABS Schools Australia statistics* (McLennan 1998).

### School vaccination coverage

According to Commonwealth data, 1.33 million (75 per cent) of an estimated 1.78 million Australian primary school children received an MMR vaccination at school between July and December 1998 (Table 5.1).

**Table 5.1: Summary of primary school response and vaccination coverage for the 1998 Campaign**

	NSW		VIC		QLD		WA	
	No.	%	No.	%	No.	%	No.	%
Total students	563,764	100	440,498	100	333,516	100	189,984	100
Forms returned	528,236	93.7	419,111	95.1	284,275	85.2	180,907	95.2
Consents	448,976	79.6	388,981	88.3	230,253	69.0	151,476	79.7
Vaccinated	425,155	75.4	367,367	83.4	213,358	64.0	145,498	76.6

	SA		TAS		ACT		NT		Australia	
	No.	%	No.	%	No.	%	No.	%	No.	%
Total students	158,638	100	45,582	100	28,290	100	21,592	100	1,781,864	100
Forms returned	154,347	97.3	42,290	92.8	27,042	95.6	16,336	75.7	1,652,544	92.7
Consents	123,804	78.0	35,004	76.8	22,650	80.1	14,452	67.0	1,415,596	79.4
Vaccinated	115,748	73.0	32,771	71.9	21,251	75.0	12,832	59.4	1,333,980	74.9

Source: Commonwealth data.

Most States/Territories achieved coverage of between 72 per cent and 77 per cent of their target student populations. The Northern Territory and Queensland vaccinated 59 per cent and 64 per cent of children respectively. The highest rate of school-based vaccination was in Victoria where 83 per cent of children received MMR vaccination.

Overall, school vaccination teams vaccinated 94 per cent of children whose parents gave permission for MMR to be given at school. This did not vary significantly by State/Territory except for the Northern Territory, in which 89 per cent of children with valid consent forms received an MMR vaccine.

**Coverage by other providers according to State/Territory data**

Each State/Territory provided coverage derived from analysis of data entered and cleaned at a State/Territory level. The Northern Territory provided an estimate of overall coverage only. Otherwise, except for New South Wales, these data included information about the number of children in the target population vaccinated by other providers (including GPs, council clinics etc) in addition to those vaccinated at school. South Australia also provided validated data about children who had already received two doses of MMR before the Campaign.

Each State/Territory's school and 'other provider' data (Figure 5.1) were combined to estimate the total number of children vaccinated. This total coverage did not include children who had received a MMR vaccination before the Campaign. The highest coverage estimates were from Victoria (87 per cent), the Australian Capital Territory (86 per cent) and Western Australia (85 per cent). In the case of Victoria this was almost entirely due to the school vaccination program, with only 3 per cent of children vaccinated outside of school. For the remaining State/Territories coverage levels were between 71 per cent and 79 per cent. Twelve per cent of children from the Australian Capital Territory and Queensland were vaccinated by GPs or other providers. In contrast to Victoria, vaccination by other providers in Queensland boosted relatively low school-based vaccination coverage. The proportion of vaccinations given by other providers was not measured in New South Wales.

**Figure 5.1: Proportions of primary school children vaccinated during the 1998 Campaign using State/Territory data according to type of provider**



\*'Other provider' information not available for New South Wales.

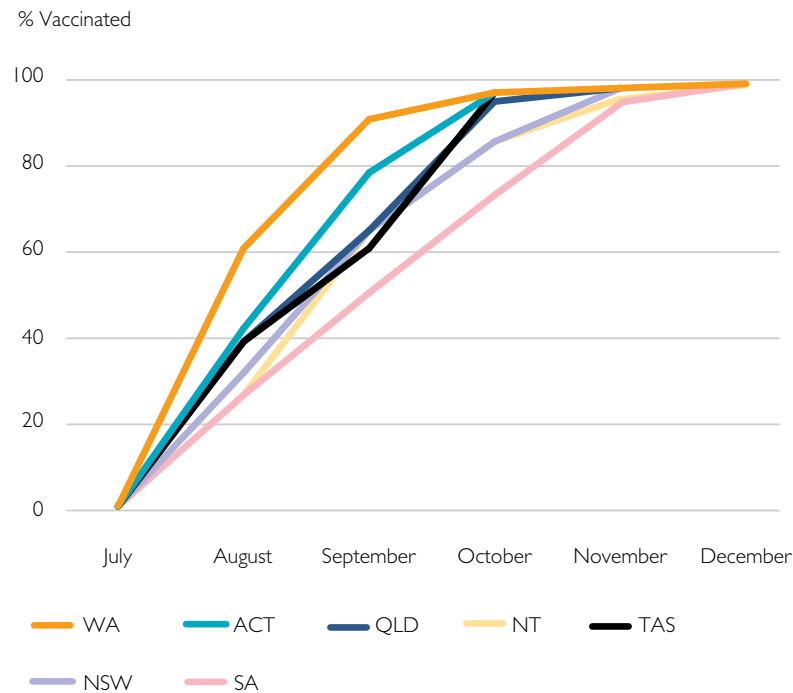
**Coverage by year/grade**

The number of vaccinations given in each grade was determined using each State/Territory's definition of a primary school student. The percentage of children vaccinated in each grade for most jurisdictions was directly proportional to the overall coverage achieved by the State/Territory. Lower coverage was observed where regional vaccination programs were conducted just before the Campaign.

**Progress of the Campaign**

Over two-thirds (67 per cent) of all children were vaccinated in the first three months of the Campaign (Figure 5.2). The Campaign was extended for States with many remote area schools (Western Australia, Queensland) and for South Australia. Information about the date of vaccination was not available for Victoria.

**Figure 5.2: Cumulative percentage of children vaccinated at school by month of vaccination and State/Territory**



Source: Commonwealth data.

**Coverage by region**

Seventy-three per cent of students attending metropolitan schools were vaccinated compared with 78 per cent in rural schools ( $X^2 = 3,560$ ,  $df\ 2$ ,  $p < 0.0001$ ).

## Post-Campaign surveys

Two surveys were conducted in randomly selected samples of:

- schools to identify school characteristics associated with coverage; and
- parents of primary school students, to make an independent assessment of coverage and determine parents' attitudes towards the Campaign.

A multi-stage sampling method was used to randomly select schools and parents to participate in post-Campaign surveys. This sampling method was based on the method developed by the Expanded Programme of Immunisation of the World Health Organization (Henderson & Sundaresan 1982), for use in estimating vaccination coverage. The method consists, in the first instance, of identifying geographical areas of interest then randomly selecting sites or 'clusters' from within each geographical area. Individuals are then randomly selected from within each cluster.

In this evaluation, the States and Territories were the initial sampling strata. Thirty randomly selected primary schools from each State and Territory were then used as the primary sampling units. Each school principal was then provided with instructions on how to randomly select 20 students from each school.

Allowing for a 25 per cent non-response rate, this sampling method was estimated to provide 15 students per school and 450 students per State/Territory.

### The post-Campaign school survey

The aim of this study was to identify school characteristics associated with the coverage achieved by the school-based vaccination program.

The school principal was asked to have the person responsible for the coordination of the Campaign in each of the 240 schools complete a short written questionnaire. This survey contained questions about:

- the school's demographic characteristics including total number of students, school type and proportion of students for whom English was not a first language; and
- the school's experience with the Campaign including the timing of the vaccination in relation to receiving Campaign information, methods of encouraging form return and any identified problems.

Analysis of data was performed using SAS (version 6.11). Demographic characteristics of schools which did and did not respond to the survey were compared using Pearson's chi-square test and p values less than 0.05 were considered statistically significant.

Vaccination coverage was calculated as the number of students vaccinated divided by the total number of students in each school. A univariate analysis was performed to determine the effect of school and Campaign characteristics on vaccination coverage. The mean vaccination coverages for each characteristic were compared using ANOVA, and p values less than 0.05 were considered statistically significant.

### ***Selected schools***

Of the 240 schools selected, 202 agreed to participate. Of the 38 schools which declined, the majority (32) were replaced by other schools. Schools which did not notify or were slow to notify their non-participation were not able to be replaced. Questionnaires of the school survey were returned for 192 schools. The main reason given for non-participation was the commitment of school staff to end-of-year school activities including report writing and preparation for end-of-year school functions.

### ***Demographic characteristics of the schools which did and did not respond to the school questionnaire***

School questionnaire data were collected from all States and Territories. Between 24 and 27 of the 30 schools from each State/Territory responded, with the exception of the Northern Territory, where 16 schools responded.

Non-responding schools were defined as the total number of selected schools, either initial or replacement, which did not return a school questionnaire. The demographic characteristics of the 192 responding schools were compared with those of the 80 non-responding schools using a chi-square test.

The response rate was significantly higher for schools with more than 400 pupils compared with smaller schools ( $\chi^2 = 7.38$ ,  $df\ 2$ ,  $p=0.025$ ). While between 41 per cent (<200 pupils) and 48 per cent (200-400 pupils) of schools were non-responding, only 10 per cent of large schools did not return a questionnaire.

There was no difference in the response rate when schools were compared by type (Government/non-Government) or by region (rural/metropolitan).

### ***Questionnaire responses for the school survey***

The mean time between the date on which information packs were received by each school and the school's date of vaccination was 43.6 days. The Campaign was completed for 39 per cent of schools in one month, for 76 per cent in two months, and for 90 per cent in three months. There was a statistically significant difference between the mean number of intervening days in each State/Territory ( $p<0.001$ ). Children in schools in the Northern Territory and Western Australia were vaccinated an average of 33.2 and 24.3 days after receiving Campaign information compared with 65.2 days in South Australia.

Each school was asked to describe the method used to encourage parents to return completed consent forms. Twenty-one per cent of schools used verbal reminders while 40 per cent used written reminders. The latter included notices published in school bulletins or newsletters. A combination of reminder techniques was used by 39 per cent of schools.

Schools were also asked if there were any specific problems encountered during the Campaign which may have reduced the total number of children vaccinated. Nearly 90 per cent of schools said they had not experienced any problems with the Campaign. Of the 20 (10 per cent) schools that reported a problem, 12 (60 per cent) described the single biggest problem as absenteeism of students on the day of vaccination.

### Univariate analysis

The demographic characteristics and Campaign experiences of each of the surveyed schools were compared using their vaccination coverage derived from the Commonwealth data in order to determine factors associated with coverage (Table 5.2).

Table 5.2: **School and Campaign characteristics associated with vaccination coverage in surveyed schools**

Characteristic		Vaccination coverage (per cent)	Significance
<b>Region</b>	metropolitan	72	p<0.0001
	rural	80	
<b>Per cent ESL students</b>	0 per cent	78	p<0.05
	1-10 per cent	71	
	>10 per cent	72	
<b>Method of encouraging form return</b>	verbal	80	p<0.01
	written	73	
	other	74	
<b>School size</b>	<200	76	NS
	200-400	76	
	>400	71	
<b>School type</b>	Government	75	NS
	Catholic	75	
	Other religious	75	
<b>Staff assigned to Campaign</b>	1	75	NS
	>1	75	
<b>Problem identified</b>	Yes	72	NS
	No	75	
<b>Time between information and vaccination</b>	<30 days	76	NS
	30-60 days	73	
	>60 days	77	

NS = non-significant; ESL = English spoken as a second language.

There was a statistically significant difference in the mean vaccination coverage between schools by region, with rural schools vaccinating proportionally more students than their metropolitan counterparts (p<0.0001). The coverage was identical (75 per cent) for Government and non-Government schools. Schools with more than 400 students vaccinated 71 per cent of students compared with 76 per cent in smaller schools, but this difference was not statistically significant. The coverage for schools where all students spoke

English at home was significantly higher than the coverage for schools where there were students who spoke a language other than English at home.

Among schools that identified problems at the time of the Campaign, such as absenteeism of students or shortage of consent forms, the coverage was 72 per cent compared with 75 per cent in those that did not identify a problem. This 3 per cent difference was not statistically significant. Similarly, the number of school staff assigned as coordinators of the Campaign did not affect the vaccination coverage.

Although the time between schools receiving information packs and children being vaccinated differed markedly by State/Territory, this did not appear to have an effect on the overall proportion of students vaccinated.

The method of encouraging parents to return consent forms had a significant association with vaccination coverage for each school. Those schools which chose to remind parents verbally, by speaking to them either directly or indirectly through their children, achieved higher vaccination coverage (80 per cent) than those schools which chose either written reminders (73 per cent) or combinations of other methods (74 per cent). This difference was statistically significant ( $p < 0.01$ ).

### **The post-Campaign parent survey**

To assess vaccination coverage at school and by alternative providers and to determine parents' attitudes towards the school-based vaccination program, computer-assisted telephone interviews were conducted with consenting parents by a market research company on behalf of the NCIRS.

The parent survey collected information about the action of the parent/care-giver in response to the Campaign; whether the child identified had received an MMR vaccination, and if so, whether through the school-based program or through an alternative provider. The survey also collected demographic information about the respondents and their partners as well as determining parents' attitudes to the school-based vaccination program.

Coding of open-ended questions was performed by the market research company in consultation with the NCIRS. The coverage for surveyed children was defined as the number of children vaccinated divided by the number of parents interviewed. The vaccination status of each child was determined by incorporating responses to both closed and open-ended questions. Data were analysed using SAS (version 6.11).

According to survey responses, children were categorised as 'vaccinated at school', 'vaccinated elsewhere' or 'not vaccinated' at the time of interview. A univariate analysis was performed to examine the relationship between vaccination status and the demographic features of both the parents/care-givers and the schools from which children were selected.

### ***Response rate***

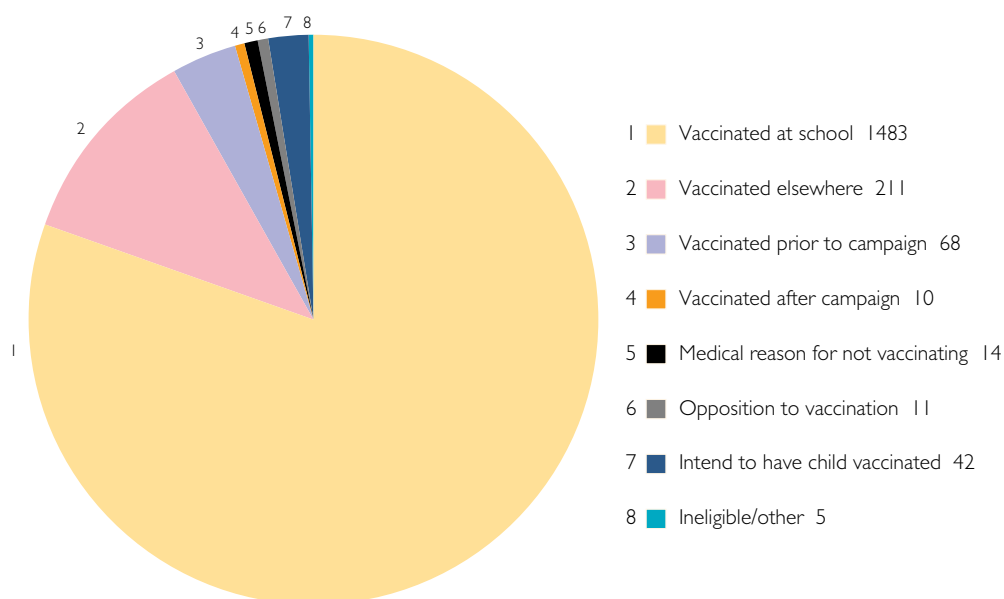
Of the 192 schools responding to the evaluation, 3,840 letters (192 schools ( 20 students) were distributed to parents of randomly selected primary school children. Sixty per cent of the 2,225 parents returned a completed consent form to the school, 84 per cent of whom agreed to the release of their contact details. Of the 1,845 parents who were able to be contacted, only one parent/care-giver refused to be interviewed. Survey responses were therefore available for 48 per cent of parents (1,844/3,840).



### ***Vaccination coverage***

Of the 1,844 surveyed respondents, 1,772 (96 per cent) reported that their child had been vaccinated (Table 5.3). The majority (80 per cent) had received an MMR vaccination as part of the school-based program and 289 (16 per cent) children had been vaccinated by other providers. Seventy-two parents stated that their child was not vaccinated at the time of interview, but over 50 per cent of these parents said that they intended to have the child vaccinated in the near future. Less than 1 per cent of parents stated that they were opposed to vaccination.

**Table 5.3: Vaccination status of children in parent survey**



### ***Characteristics associated with choice of vaccination provider***

A univariate analysis was performed to determine which characteristics, school or parent related, might be associated with the child having been vaccinated at school or by another provider.

A number of school characteristics were associated with whether the child was vaccinated at school or by another provider (Table 5.4). Children in the survey who attended schools in Queensland were more likely to be vaccinated outside of school (30 per cent) compared with children in other States and Territories (12-19 per cent). This difference was statistically significant ( $X^2 = 36.63$ ,  $df = 7$ ,  $p < 0.001$ ). When Queensland was excluded from the analysis this difference was not significant ( $p = 0.60$ ). Children from metropolitan schools (19 per cent) were also more likely to be vaccinated by alternative providers than children from rural areas (14 per cent) ( $X^2 = 7.21$ ,  $df = 1$ ,  $p < 0.01$ ). While the type of school did not appear to be associated with where the child received his/her MMR vaccination, the size of the school was significant. Children attending schools with more than 400 students were less likely to be vaccinated at school (76 per cent) compared with schools with less than 400 students (84-87 per cent). This difference was statistically significant ( $X^2 = 21.0$ ,  $df = 1$ ,  $p < 0.001$ ).

Table 5.4: **Demographic characteristics of schools and vaccination provider for surveyed children**

Demographic characteristics of school	Vaccinated at school (%)	Vaccinated by other provider (%)	Significance
<b>State/Territory</b>			
NSW	86.90	13.14	
VIC	87.82	12.18	
QLD	70.35	29.65	
WA	82.44	17.56	
SA	84.76	15.24	
ACT	86.17	13.83	
TAS	85.05	14.95	
NT	81.40	18.60	p<0.001
<b>Region</b>			
Metropolitan	81.49	18.51	
Rural	86.43	13.57	p<0.01
<b>School type</b>			
Government	83.20	16.80	
Non-Government	83.97	16.03	NS
<b>School size</b>			
<200	87.39	12.61	
200-400	84.22	15.78	
>400	76.19	23.81	p<0.001

None of the parent demographic characteristics were significantly associated with whether the child was vaccinated at school or by another provider.

#### ***Parent satisfaction with the school Campaign***

The majority of parents were satisfied with all aspects of the Campaign (Table 5.5). Less than 4 per cent of parents were unsure or dissatisfied with the information provided in the kit sent home. Of the 66 respondents who were unsure or not satisfied, 26 (39.4 per cent) stated that they did not read the information, 22 (33 per cent) said the kit needed more information about the side effects of vaccination or the reasons for the change to the measles vaccination schedule, and the remaining 18 (27 per cent) said they found the information biased or confusing.

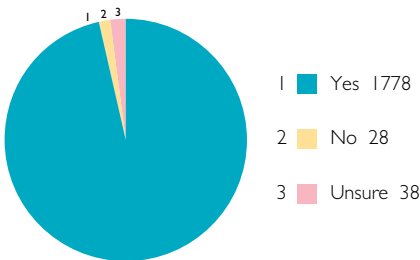
Eighty-nine per cent of respondents said they were satisfied with the overall procedure of the school-based vaccination program while 8 per cent were unsure. Of the 210 parents who were unsure or dissatisfied, 71 said that paperwork and /or procedural problems had contributed to their dissatisfaction, 27 said that they had been unable to be present on the day their child was vaccinated, and the remainder cited non-attendance of their child on the day.

When asked if they would have their child vaccinated at school in the future, 87 per cent of parents replied that they would. The reasons given by those respondents who answered negatively included: prefer GP (45 per cent); medical reason such as adverse event (9 per cent); prefer to be present at the time (9 per cent); fears regarding procedure (6 per cent); child has behavioural problem (3 per cent). The remaining 21 per cent said that their participation in future campaigns would depend on the type of campaign and vaccination, the information available and the child’s maturity.

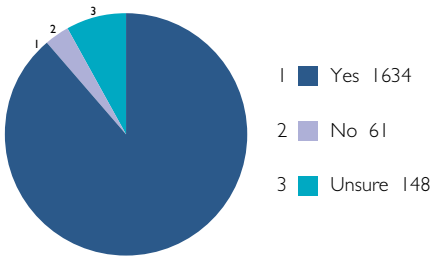
At the end of the telephone survey, parents were given the opportunity to make any further comments about the Campaign. Nearly 80 per cent of the 1,076 comments made were positive. The majority of positive comments referred to the Campaign as a ‘convenient’ and ‘useful’ idea, which should be continued or expanded. Ten per cent of comments were equivocal and referred to social issues surrounding vaccination including the thoughtlessness of parents who refuse to vaccinate. The remaining 10 per cent of comments were negative with the majority referring to the need for improved information especially about changes to the measles vaccination schedule.

**Table 5.5: Parents’ attitudes towards school vaccination Campaign**

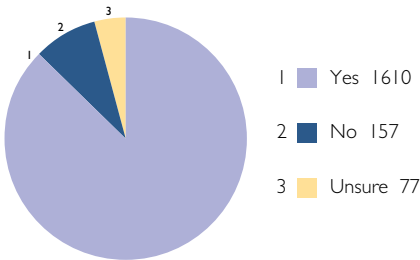
Satisfied with information kit



Satisfied with procedure on school vaccination day\*



Likely to vaccinate at school campaign in future



\*One respondent refused to answer.

## 5.2 Evaluation of the preschool intervention

The main aims of the preschool evaluation were to:

- determine the response to a reminder letter sent by the Health Insurance Commission to parents of children due or overdue for their first dose of MMR vaccine as part of the Campaign;
- measure the proportion of children who were vaccinated after the reminder letter was sent;
- evaluate the usefulness of the ACIR in identifying children overdue for MMR vaccination; and
- estimate the post-Campaign MMR vaccine coverage for the cohort of Australian children who were aged 12-42 months at 25 July 1998.

In July 1998, the Health Insurance Commission sent a reminder letter to 162,143 parents of children identified on the ACIR as due or overdue for their first dose of MMR. Parents were encouraged to ensure that their children received the MMR vaccination.

Using the ACIR as the sampling frame, the Health Insurance Commission obtained a national random sample of 1,601 of the 162,143 children identified as due or overdue for the first dose of the MMR vaccination.

Computer-assisted telephone interviews were conducted with consenting parents by a market research company on behalf of the NCIRS. Data were analysed using SAS (version 6.11). Univariate analyses were used to answer the principal research questions and bivariate analyses to examine the relationship between demographic factors, vaccination status and vaccination-related behaviour. Pearson's chi-square, Student's t and Wilcoxon tests were used where appropriate to test for differences and p values less than 0.05 were considered statistically significant.

The demography of the children whose parents were interviewed was compared with the demography of those whose parents were not interviewed for the following variables recorded by the ACIR: child's age, gender and postcode.

Of the 1,601 children randomly selected for the preschool survey 910 (57 per cent) were contacted and 886 (55 per cent) parents or care-givers were interviewed. There were 24 non-consenters, a refusal rate of 2.6 per cent of successful contacts. The report is based on this national sample of 886 children (the respondents).

There were no differences between the respondents and non-respondents in the distribution of the children's ages, gender or State/Territory of residence. However, there was a difference in the proportion of children residing in metropolitan or rural areas: 64 per cent of respondents lived in metropolitan areas compared with 70 per cent of non-respondents (chi-square 10.12, df 1, p=0.001).

## **Vaccination coverage**

### **Respondents with written vaccination records**

Respondents were asked to refer to their child's written vaccination record when answering the survey questions and most (77 per cent) were able to do so. Of the 685 who could refer to a written record, 640 stated that the record showed their child had received the first dose of MMR, while the remaining 45 respondents either said the record did not confirm that the child had received the vaccine or did not know what the record showed. Four of these 45 respondents said that, even though the MMR vaccination was not in the written record, they were certain the child had been vaccinated; these four were considered respondents without written vaccination records for the remainder of the analysis.

Of the 640 respondents who said that the child's vaccination record showed that the first dose of MMR was received, 639 could recall from whom the vaccination was obtained. Most vaccinations (71 per cent) had been administered by a GP.

### **Respondents without written vaccination records**

Respondents who were unable to refer to written vaccination records were also asked whether their child had received the first dose of MMR. Of the 201 respondents, 153 said they were certain that their child had been vaccinated, while 36 said their child had not and 12 respondents were unsure of the child's vaccination status.

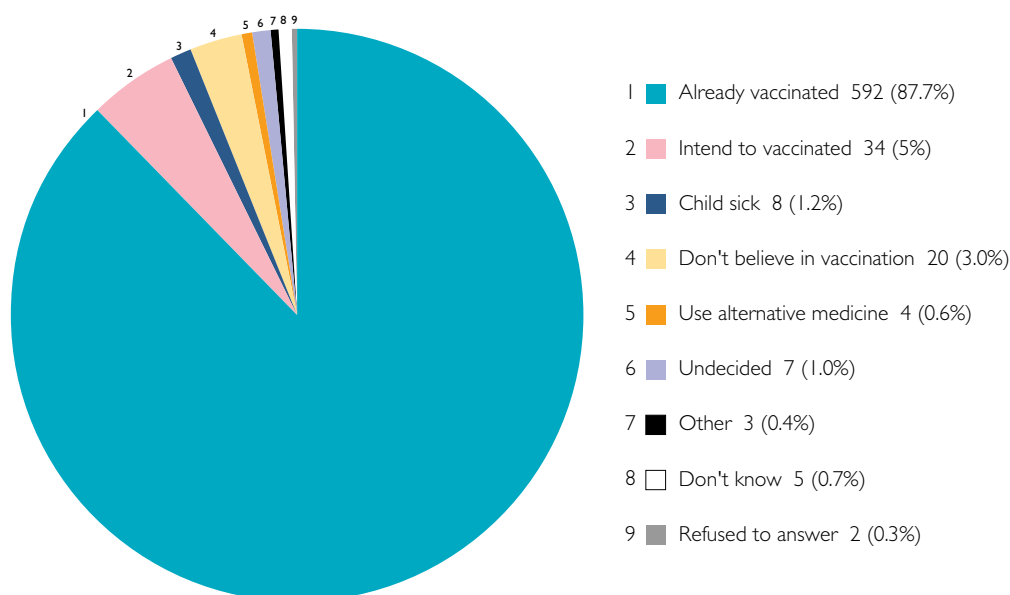
### **All respondents (n=886)**

It was estimated that 700 (79 per cent) of the 886 children had received their MMR vaccination before receipt of the reminder letter and 551 (62 per cent) stated they had written records to confirm this. This suggested that the accuracy of the ACIR among all survey respondents was approximately 21 per cent (or 38 per cent if none of those without written records had been vaccinated). Ninety-seven children (11 per cent) were said to have been vaccinated after receipt of the letter. The average age of the children vaccinated after receipt of the letter (16.8 months) was significantly greater than the average age of those vaccinated between 1 January and receipt of the letter (13.4 months) ( $z = 8.12$ ,  $p=0.001$ ).

### **Reasons for not having child vaccinated after receiving the reminder letter**

Of the 886 parents and care-givers interviewed, 772 (87 per cent) recalled seeing the MMR reminder letter from the Health Insurance Commission sent out in late July 1998. These 772 respondents were asked whether their child had received the MMR vaccination since they received the letter. Of the 675 respondents who did not have their child vaccinated subsequent to receiving the letter, 592 stated that the MMR vaccine was not sought because their child had already received the vaccine. For the remainder the reasons are listed in Table 5.6.

Table 5.6: **Reason for not having child vaccinated with MMR vaccine after receiving letter among those who recalled the letter**



#### Comparison of children who were vaccinated and unvaccinated at the time of receiving the reminder letter

Children who were vaccinated before receipt of the reminder letter were compared with children who were not vaccinated at the time of receiving the reminder letter. The former group were statistically significantly more likely to live in households with two or more versus one adult (OR=2.33, 95 per cent CI 1.26-4.30), have three or fewer children in their household (OR=2.51, 95 per cent CI 1.75-4.03) and be the oldest or second oldest child (OR=1.43, 95 per cent CI 1.02-2.01). A first child was three times more likely to be vaccinated (OR=3.05, 95 per cent CI 1.62-5.73) than subsequent children (Table 5.7).

Table 5.7: **Odds ratios and 95 per cent confidence intervals for children vaccinated before receipt of reminder letter by household characteristics and birth order**

Demographic characteristics	Odds ratio	(95 per cent CI)
1 adult in household*	1.00	
> 2 adults in household	2.33	(1.26-4.30)
> 3 children in household*	1.00	
< 3 children in household	2.51	(1.75-4.03)
Third or subsequent child*	1.00	
Oldest or second oldest	1.43	(1.02-2.01)
Second or subsequent child*	1.00	
First child	3.05	(1.62-5.73)

\*Reference group.

### Comparison of children subsequently vaccinated and children who remained unvaccinated after the reminder letter

According to the respondents, 97 (54 per cent) of the 180 possibly overdue children were vaccinated after the reminder letter, while 83 were not or were unsure. There were no differences in gender (chi-square 1.23, df 4,  $p=0.872$ ) or State or Territory of residence (chi-square 11.59, df 14,  $p=0.639$ ) between the 97 children who were vaccinated after receipt of the reminder letter and the 83 who were not. However, there was a significant difference in age: the mean age (as at 25 July 1998) of the children who were vaccinated was 17.6 months and of those who were not vaccinated was 26.2 months ( $z = 6.11$ ,  $p=0.001$ ).

### Estimated coverage of children aged 12-42 months after the Campaign

Coverage estimates for the overdue cohort (162,000) and for the entire cohort of children aged 12-42 months (650,000) were calculated based on best and worst case examples (Table 5.8). The best-case estimates assumed that the survey respondents were representative of the entire sample. The worst-case estimates assumed that all non-respondents (715) were unvaccinated.

Before the Campaign, between 86.0 per cent and 94.8 per cent of all children aged 12-42 months were vaccinated. This coverage is derived from the addition of the 488,000 children who were vaccinated on time and the best and worst estimates of the number of children in the overdue cohort who had also already been vaccinated (127,980 and 71,280 respectively). Between 6 per cent and 11 per cent of the overdue cohort received an MMR vaccine after the reminder letter improving coverage for the entire cohort by between 1.5 per cent and 2.7 per cent. Final MMR coverage therefore for the cohort of 650,000 children aged 12-42 months was at worst 87.5 per cent and at best 97.5 per cent.

Table 5.8: **Best and worst case coverage estimates for preschool age children**

	Survey sample N = 886*		Overdue cohort N = 162 000 <sup>H</sup>		Entire cohort N = 650 000 <sup>I</sup>			
	n	%		n	%		n	%
Vaccinated before letter	700	79	Best <sup>§</sup>	127,980	79	Best <sup>#</sup>	615,980	94.8
			Worst <sup>+</sup>	71,280	44	Worst <sup>**</sup>	559,280	86.0
Vaccinated after letter	97	11	Best	17,820	11	Best	17,820	2.7
			Worst	9,815	6	Worst	9,815	1.5
Total vaccinated	797	90	Best	145,800	90	Best	633,800	97.5
			Worst	81,095	50	Worst	569,095	87.5

\* Number of survey respondents from a random sample of 1,601 parents/caregivers (55%).

<sup>H</sup> Number of children aged 12-42 months overdue for first dose of MMR according to the ACIR.

<sup>I</sup> Estimated total number of children aged 12-42 months.

<sup>§</sup> Best case estimates of number of children vaccinated assuming survey results for 886 respondents are representative of overdue cohort.

<sup>#</sup> Best case estimates of number of children vaccinated calculated as best estimates for overdue cohort added to the total number of children identified by ACIR as being vaccinated at the time of the survey.

<sup>+</sup> Worst case estimates of number of children vaccinated extrapolated from survey results and assuming all children of non-respondents (715) are unvaccinated.

<sup>\*\*</sup> Worst case estimates of number of children vaccinated calculated as the worst estimates for the overdue cohort added to the total number of children identified by ACIR as being vaccinated at the time of the survey.

## 5.3 Evaluation using ACIR data

The main aims of this study were to:

- give a national picture of the progress of the Campaign, as recorded by the ACIR, among children under the age of 7 years outside the school-based component of the Campaign; and
- ‘track’ the vaccination status of children in the overdue cohort who were aged between 12 and 42 months at the start of the Campaign.

The overdue cohort was defined as those 162,143 children born between 1 January 1995 and 24 July 1997 (aged 12-42 months) identified by the ACIR as not having received a dose of MMR vaccine before 23 July 1998. Although this cohort consisted of children both due (12 months but not yet 13 months) and overdue (13-42 months) for their first MMR vaccination, they are referred to as the overdue cohort for the purposes of this study.

The NCIRS receives a quarterly update of all ACIR data in de-identified form from the Health Insurance Commission. The date on which the letter was expected to have been received on this date by the majority of households (25 July 1998) was used as the starting date for tracking MMR vaccination status among the overdue cohort. Tracking ceased on 31 March 1999.

The main outcome variable (MMR dose recorded) was stratified by variables thought likely to influence MMR uptake, including age of child, residential address by State/Territory and rural/metropolitan location and provider type. In addition, the number and pattern of MMR doses over time was compared graphically with the number and pattern of doses of other vaccines recorded by the ACIR.

### Overall trends in MMR vaccine use

Comparative data for doses of MMR and the third dose of DTP, as recorded by the ACIR for the period January 1996 (when the ACIR began operation) to March 1999, are shown in Figure 5.3.

Figure 5.3: **Trends in vaccine use for MMR and third DTP according to the ACIR, January 1996 to March 1999**

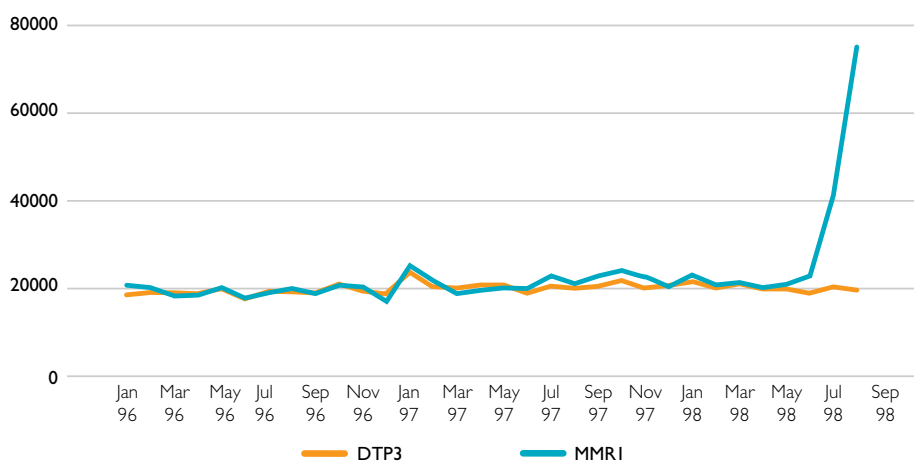
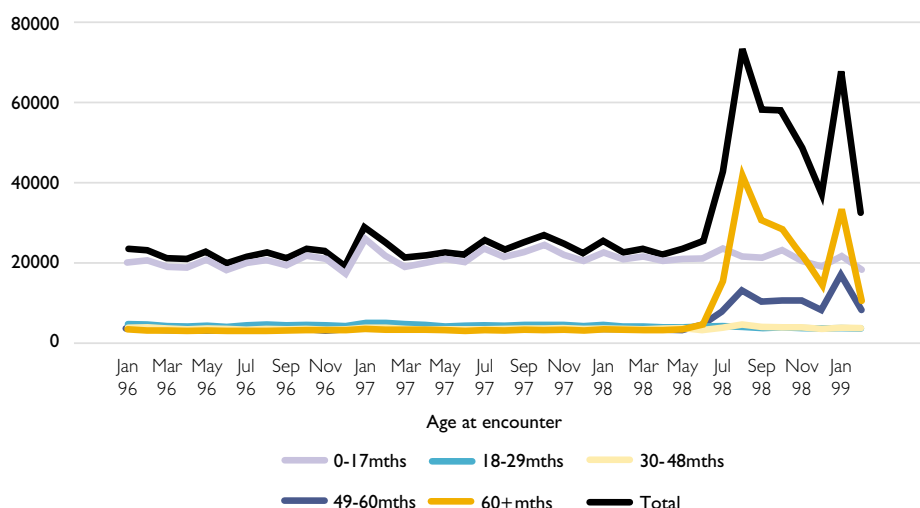




Figure 5.4: **Trends in MMR use by age at encounter for all encounters according to the ACIR, January 1996 to February 1999**



From January 1996 to the beginning of June 1998, just before the Campaign, notifications of both MMR and third DTP encounters remained stable at approximately 20,000 per month. A dramatic rise in MMR encounters occurred in July 1998, with a peak in August 1998, when over 70,000 MMR vaccines were recorded. This increase coincided with the introduction of a number of initiatives aimed at increasing vaccination and notification to the ACIR, including the Childcare Rebate Scheme, Campaign media releases, the beginning of Campaign school-based vaccination and the General Practice Immunisation Incentives outcomes payment scheme.

Although notifications of MMR encounters decreased before the Christmas holiday period in 1998, they rose again in January 1999 to over 65,000, due to the introduction of the second dose of MMR vaccine for 4-5 year old children before school entry. In contrast, encounters for the third DTP vaccination over the same period remained fairly stable. The decrease seen in February and March 1999 in Figures 5.3 and 5.4 reflect delayed reporting to the ACIR.

### Trends in MMR vaccine use by age group

The national trends in MMR vaccine use are shown stratified by age of the child at encounter (0-17 months, 18-29 months, 30-48 months, 49-60 months and over 60 months) in Figure 5.4. This shows that the striking increase in MMR encounters between July 1998 and January 1999 was confined to the two oldest age groups (49-60 months and greater than 60 months).

## **Tracking MMR use in the overdue cohort**

### **Proportion vaccinated and date of vaccination**

At the censoring date on 31 March 1999, 60,028 (37 per cent) of the 162,143 children whose care-givers had been sent a reminder letter regarding MMR vaccination on 24 July 1998 had a dose of MMR recorded on the ACIR. Of these 60,028, approximately 40,000 (67 per cent) were found at the censoring date to now have a date of encounter before 25 July 1998 which had not been recorded on the ACIR when they were originally assessed for eligibility for reminder letters. The remaining 20,128 children had an encounter date after 25 July 1998.

### **Age of vaccination of children in the overdue cohort**

Children aged 11-17 months were the main recipients of MMR vaccines, with a peak in July 1998 largely before the reminder letters would have been received. Increased activity continued until October 1998. This suggested that a major impact of both the Campaign media activity in early July and the reminder letter was on parents of children approaching the due date for MMR vaccination and those parents whose children were overdue by less than three months.

## Comparison of MMR vaccination before and after the reminder letter

### Vaccination of the overdue cohort by age group

Age at vaccination was a crucial variable influencing the pattern of MMR doses observed in the overdue cohort (Table 5.9). Children aged less than 18 months accounted for the majority (84 per cent) of children in the original overdue cohort later recorded by the ACIR as vaccinated at the time of censoring on 31 March 1999. This age group made up 95 per cent of vaccinations present on the ACIR by 31 March 1999 although absent at the reference date, but only 64 per cent of those given after the reference date. By contrast, only 1 per cent of MMR encounters which took place before the reference date were in the oldest age group (30-51 months). These children accounted for 13 per cent of MMR encounters occurring after the reference date, a ratio of 7.9 (2,525/320). Indeed, there was a progressive increase in the ratio of 'post' to 'pre' reference date vaccinations recorded on the ACIR from 2.5 times as many in the age group 18-23 months to 3.3 times as many in those 24-29 months of age.

Table 5.9: **Vaccination before and after the reference date by age**

	MMRs given to children aged 11-17 months per cent (n)	MMRs given to children aged 18-23 months per cent (n)	MMRs given to children aged 24-29 months per cent (n)	MMRs given to children aged 30-51 months per cent (n)
MMR encounter after letter sent	64.2 (12,917)	16.5 (3,319)	6.8 (1,366)	12.6 (2,525)
MMR encounter before letter sent	94.8 (36,620)	3.4 (1,301)	1.1 (410)	0.8 (320)

Missing = 1,250.

### Vaccination of the overdue cohort by provider type and place of residence

Other variables, such as place of residence and category of vaccination provider did not appear to be independent predictors of vaccination.

## 5.4 The serological evaluation

The aim of this evaluation was to assess, by a national serological survey, the effect of the Campaign on the susceptibility to measles of children aged 1-18 years.

### Samples

A total of 6,000 specimens (3,000 before and 3,000 after the Campaign) were required to achieve confidence intervals of  $\pm 5$  per cent, based on the expected prevalence of susceptibility in different groups. Samples were stratified according to age, from 1-18 years, and the number of samples collected from each State and Territory was proportional to the population distribution with approximately equal numbers collected from males and females.

Diagnostic laboratories (haematology, serology and biochemistry) throughout Australia were invited to participate by contributing sera that had been submitted for diagnostic testing and would otherwise have been discarded.

Sera were excluded from subjects who were immunocompromised, had received multiple transfusions in the past three months, were known to be infected with the human immunodeficiency virus or had had serum collected for the diagnosis of measles. Only one specimen of serum from any subject was tested. Laboratories were asked to indicate gender, age or date of birth, postcode of residence (if available) of each subject and date of collection of serum. Sera were de-identified before testing and coded by date of collection, State or Territory of origin, referring laboratory and number. The study was approved by relevant institutional ethics committees and the Statewide Health Confidentiality and Ethics Committee of the NSW Health Department.

Laboratories were asked to submit sera collected during the 18 months before the start of the Campaign in August 1998 for the pre-Campaign survey and sera collected during the period January to May 1999 for the post-Campaign survey.

## **Laboratory tests**

Sera were tested using the Enzygnost (Behring) anti-measles IgG enzyme immunoassay (EIA). The method and interpretation of the results were in accordance with the manufacturer's instructions. Results were expressed in international units (IU). IgG levels less than 150 mIU/mL were interpreted as negative, those between 150 and 343 as equivocal, and those more than 343 were positive. All sera for which the result was equivocal were retested.

A proportion of sera for which the result remained equivocal were tested by plaque reduction neutralisation (PRN) assay (Albrecht et al 1981) at the Victorian Infectious Diseases Research Laboratory. A formula was used to calculate the PRN titre, which was the serum dilution that reduced the number of plaques in measles virus infected Vero cell monolayers by 50 per cent. Results were interpreted as follows: PRN titre <8, negative; 8-119, susceptible to measles; 120-899, protected against disease; >900, protected against infection (Chen et al 1990).

## **Results**

Of the proposed 3,000, a total of 2,941 (98 per cent) and 2,906 (97 per cent) sera were tested for measles-specific IgG in the pre and post-Campaign surveys respectively (Table 5.10).

In the pre-Campaign survey of 2,941 sera, results were positive in 2,486 (84.5 per cent), negative in 359 (12.2 per cent) and equivocal in 96 (3.3 per cent). In 2,906 sera tested in the post-Campaign survey, results were positive in 2,610 (89.8 per cent), negative in 215 (7.4 per cent) and equivocal in 81 (2.8 per cent). These differences are highly significant (chi-square test for trend;  $p < 0.001$ ).

**Table 5.10: Results of pre and post-Campaign surveys in different age groups showing evidence of past infection or immunisation and evidence of susceptibility before and after the Campaign**

Age group		Infant (1 year)	Preschool (2-5 yrs)	Primary (6-11 yrs)	High school (12-18 yrs)	Total
'Pre'	No. tested	169	751	960	1,061	2,941
	Positive	118 (70%)	617 (82%)	809 (84%)	942 (89%)	2,486 (85%)
	Equivocal	4 (2%)	13 (2%)	27 (3%)	52 (5%)	96 (3%)
	Negative	47 (28%)	121 (16%)	124 (13%)	67 (6%)	359 (12%)
	IgG detected <sup>2</sup>	122 (72%)	630 (84%)	836 (87%)	994 (94%)	2,582 (88%)
	95% CI	65.4%, 78.9%	81.3%, 86.5%	85.0%, 89.2%	92.2%, 95.1%	86.8%, 89.1%
	Susceptible <sup>3</sup>	51 (30%)	134 (18%)	151 (16%)	119 (11%)	455 (15%)
	95% CI	23.3%, 37.1%	15.1%, 20.6%	13.4%, 18.0%	9.3%, 13.1%	14.2%, 16.8%
'Post'	No. tested	182	714	956	1054	2906
	Positive	114 (63%)	635 (89%)	903 (94%)	958 (91%)	2,610 (90%)
	Equivocal	3 (2%)	21 (3%)	17 (2%)	40 (4%)	81 (3%)
	Negative	65 (36%)	58 (8%)	36 (4%)	56 (5%)	215 (7%)
	IgG detected <sup>2</sup>	117 (65%)	656 (92%)	920 (96%)	998 (95%)	2691 (93%)
	95% CI	57.3%, 71.2%	89.9%, 93.9%	95.0%, 97.4%	93.3%, 96.0%	91.6%, 93.6%
	Susceptible <sup>3</sup>	68 (37%)	79 (11%)	52 (6%)	96 (9%)	295 (10%)
	95% CI	30.3%, 44.4%	8.8%, 13.4%	4.1%, 7.0%	7.4%, 10.8%	8.8%, 11.0%
P values	IgG detected <sup>4</sup>	0.14 (NS)	<0.001	<0.001	0.35 (NS)	-
	Susceptible <sup>4</sup>	0.18 (NS)	<0.001	<0.001	0.11 (NS)	-
	Positive	0.18 (NS)	<0.001	<0.001	0.11 (NS)	-

1 'Pre' and 'Post' refer to results of serological surveys before and after the Campaign.

2 Includes all sera in which measles IgG was detected (positive and equivocal enzyme immunoassay EIA results, see text). CI=confidence interval.

3 Includes all sera in which IgG antibody was not detected (EIA negative) or PRN titres were below protective level (EIA equivocal).

4 Chi-square test, two-sided p value, to compare 'Pre' and 'Post' survey results for each age group.

To determine whether the differences varied in age groups relevant to intervention in the Campaign, sera were grouped as follows: infants (ages 1 to <2 years); preschool (ages 2-5 years); primary school (6-11 years) and high school (12-18 years). Positive and equivocal results were combined to determine the proportion of children with evidence of past infection or immunisation, since PRN assay showed that all sera with equivocal results contained specific measles antibody (see below). In addition, since the low level of antibody in most sera in which results were equivocal is unlikely to protect against infection, results were also analysed according to the proportion of children in each age group who were likely to be susceptible (negative and equivocal results combined).

Comparison between pre and post-Campaign EIA results (Figures 5.5 and 5.6) showed highly significant differences among preschool and primary school age children, but not among infants or high school age children. Differences were also significant in the same age groups when proportions of subjects with evidence of past infection/immunisation and children who were susceptible to infection were compared between pre and post-Campaign surveys.

The results of measles IgG EIA were equivocal in 177 sera overall (96 in the pre-Campaign survey and 81 in the post-Campaign survey), and of these, 73 (41 per cent) were tested by PRN assay. Measles neutralising antibody was detected in all sera tested. As expected, PRN titres were low: 22/46 (48 per cent) of sera from the pre-Campaign survey and 19/27 (70 per cent) from the post-Campaign survey (41/73, 57 per cent overall) had titres in the range 8-119, indicating susceptibility to measles. The remainder had titres in the range 120-899, regarded as protective against typical measles, but not necessarily against modified or subclinical infection. None of the sera for which the EIA results were equivocal had PRN titres >900, consistent with fully protective antibody levels. Differences between proportions in these ranges or mean PRN titres did not differ significantly between sera from the pre-Campaign survey and the post-Campaign survey.

Figure 5.5: **Percentages of sera for which enzyme immunoassays were positive, negative and equivocal in the pre-Campaign survey, by age**

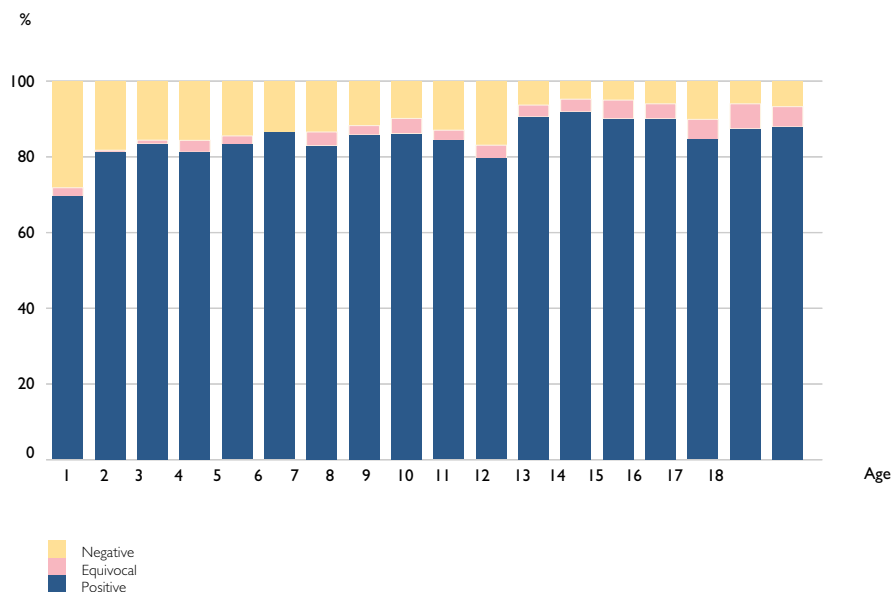
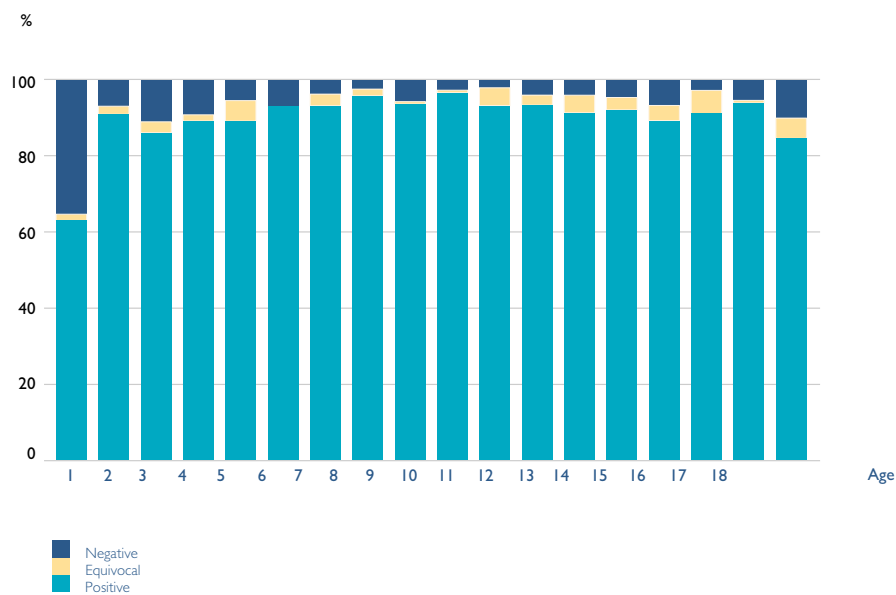


Figure 5.6: **Percentages of sera for which enzyme immunoassays were positive, negative and equivocal in the post-Campaign survey, by age**



## 5.5 Conclusions

The objectives of this evaluation of the Campaign were to estimate as accurately as possible the vaccination coverage achieved by the Campaign and to document the outcomes of the Campaign.

### **The primary school intervention**

Real time data collection by the States and Territories and the Commonwealth Department of Health and Family Services indicated that 1.33 million (75 per cent) of the 1.78 million children in 8,783 schools throughout Australia were vaccinated at school between July and December 1998. Victoria had the greatest school-based coverage (83 per cent) and other jurisdictions had coverage levels ranging from 59 per cent to 77 per cent. Rural schools had a higher coverage (78 per cent) than metropolitan schools (73 per cent). In addition, the States and Territories (except for New South Wales) attempted to estimate coverage of school age children by providers outside the school-based Campaign. Overall, the States and Territories estimated that 5 per cent of children were vaccinated outside the school Campaign (range 12.6 per cent in Queensland to 2.9 per cent in Victoria). For a number of reasons, it is likely that these estimates of coverage outside the school program were incomplete except perhaps in South Australia where the estimate of 6 per cent coverage outside the program was carefully documented.

The primary school parental survey indicated that 80 per cent of children had been vaccinated at school (compared with the real time data collection of 75 per cent) and 16 per cent by providers outside the school program (compared with 5 per cent in the real time data collection). These differences could be attributed to a bias towards selection of parents who chose to have their children vaccinated in those surveyed. However, the results of the pre and post-Campaign serosurveys make it more likely that the parental survey is a closer estimate of coverage than the real time data collection. Some deficiencies were identified in the real time data collection during the school survey, when coverage data for 5 (2.5 per cent) of the 192 participating schools could not be retrieved from the real time data set, suggesting that the data underestimated the number of school children vaccinated. Also the States and Territories acknowledged that estimates of coverage outside the school program were likely to be inaccurate. A separate national survey of 1,215 parents of school age children by the Wallis Consulting Group indicated that 79 per cent had been vaccinated at school, 11 per cent had been vaccinated outside the school, and 5 per cent had received the second dose of MMR before the Campaign (Wallis Consulting Group 1999). These figures closely approximate the results of the present survey.

Eighty-nine per cent of parents surveyed were satisfied with the Campaign, 3 per cent were not satisfied and 8 per cent were unsure. Eighty-seven per cent said that they would be likely to agree to vaccinate their child at school in a future Campaign.



## **The intervention for preschool aged children**

The evaluation of this intervention involved interviews with 886 (55 per cent) of 1,601 parents randomly selected from the group of 162,143 parents of children who were due or overdue for the first MMR vaccination according to the ACIR, and who had been sent a reminder letter by the Health Insurance Commission on 24 July 1998. The survey showed that 79 per cent of the children were up to date with the first MMR vaccination before the Campaign. So the ACIR was estimated to be 21 per cent accurate in predicting that a child was due or overdue for the first MMR vaccination.

The survey also estimated that 54 per cent of the 187 children who were truly due or overdue for their first MMR vaccination were vaccinated after the reminder letter was sent. Extrapolation of this finding to the whole cohort of due or overdue children gave an estimate that 17,800 were vaccinated after receipt of the letter and before the end of December 1998, a figure very closely approximating the actual number (18,428) recorded by the ACIR as being vaccinated during the Campaign. The closeness of this estimate suggested good representativeness of the survey sample.

Further extrapolation from this survey to the entire cohort of children aged 12-42 months (born between January 1995 and 30 June 1997) estimated that coverage of the first MMR vaccination rose from 94.7 per cent before the letter was sent to 97.5 per cent (best estimate) after the Campaign (or 86.0 per cent to 87.5 per cent, worst case scenario). Subsequent analysis of the pre and post-Campaign serosurveys suggested that the best estimate was the more likely, as measles antibody positivity in children aged 2-5 years rose from 82 per cent to 89 per cent. If a single dose of measles-containing vaccine achieves about 92 per cent seroconversion when given at the age of 12 months, then using this rate with 97.5 per cent coverage gives a predicted seropositivity rate of 89.7 per cent, adding further weight to the representativeness of the survey sample. Although only 57 per cent of the parents whose names and postal addresses were provided by the Health Insurance Commission were located, the parental study had an ascertainment rate similar to other studies using the ACIR database (Gadiel et al 1997; Bond et al 1998; Conaty & McAnulty, unpublished). Moreover this study of 886 parents from all States and Territories was the largest sample of overdue children in any study of vaccination status using the ACIR as a sampling frame.

By far the majority of parents interviewed (86 per cent) expressed favourable or very favourable comments about the Campaign and the reminder letter. Only 2 per cent expressed anti-vaccination viewpoints.

## **Outcomes using data from the ACIR**

The ACIR showed that approximately 125,000 doses of MMR were given to children aged over 60 months and under 7 years from July through December 1998. These children were probably children receiving their second doses of MMR vaccine outside the school-based program. In addition, children aged 30-60 months received approximately 40,000 doses of MMR, which were probably due both to catch-up doses of the first MMR vaccination and to second doses of MMR vaccine administered to these young children at the time of school entry.

A very pleasing outcome was the effect of the Campaign and reminder letter on children in the cohort who were due or overdue for their first MMR vaccination at 24 July 1998. The Register showed that 18,428 children from this cohort were vaccinated during the Campaign. Importantly, almost 4,000 were aged 24-51 months, a group long overdue. The cost of sending the reminder letters was approximately \$0.51 per letter: if 18,000 children were vaccinated after the letter was sent and possibly in response to the letter, then the mail out cost about \$4.60 for each child vaccinated.

The ACIR data analysed at 31 March 1999 showed that, in retrospect, 25 per cent of the overdue cohort were vaccinated before the reminder letter was sent, 12 per cent after the letter, and 63 per cent were unaccounted for. This group of approximately 100,000 children who were unaccounted for may in part be due to duplication of names on the ACIR and to failure of providers to report to the ACIR, as the parental survey (97.5 per cent coverage) and serosurveys (89 per cent immune) indicated a higher coverage with first MMR vaccination than the 85 per cent estimated by the ACIR for the cohort of children aged 12-42 months.

### **Pre and post-Campaign serosurveys**

The serosurveys showed a striking rise after the Campaign in the proportion of subjects who tested measles seropositive (by enzyme linked immunoassay) in the preschool aged children (2-5 years) and school aged children (6-12 years), and a decline in those who tested seronegative. The seropositivity increased from 82 per cent to 89 per cent ( $p < 0.0001$ ) for preschool children and from 84 per cent to 94 per cent ( $p < 0.0001$ ) for school aged children. There was no change in seropositivity in young people aged 12 to 18 years (91 per cent). Four per cent of these young people had equivocal results and 5 per cent were negative. The latter results suggested the possibility of waning immunity in this age group in whom it is difficult to estimate the proportion who have actually received two doses of a measles-containing vaccine. (The schedule for the second dose of MMR vaccine commenced in 1994 for children and young people aged 10-16 years and had variable uptake across the nation.)

One other important feature of the serosurveys was the fact that overall only 66 per cent of children aged 12-24 months were seropositive, suggesting that many children failed to receive their first dose of MMR at the scheduled age of 12 months. Comparison of these surveys with those done in South Australia and New South Wales on sera collected in late 1997 showed similarities to the pre-Campaign study in the specified age groups. However, the sample size for the present studies was only sufficient to give a national overview.

### **Summary – Outcomes evaluation**

- The Measles Control Campaign achieved an excellent response. More than 1.33 million children aged 5-12 years were vaccinated at school and it was estimated that, overall, 96 per cent (1.7 million) of the 1.78 million school children aged 5-12 years received a dose of MMR vaccine during the Campaign.
- After the Campaign the serosurvey showed that 94 per cent of children aged 6-12 years were immune to measles, a rise from 84 per cent before the Campaign.
- In the preschool group aged 12-42 months it was estimated that 97.5 per cent had received their first dose of MMR vaccine and serology showed that 89 per cent of children aged 2-5 years were protected, a rise from 82 per cent before the Campaign.
- According to the serosurvey, 66 per cent of younger children aged 12-24 months were seropositive, suggesting that many children were not receiving their first dose of MMR on time at the age of 12 months.
- There was no change in the levels of protection in the group aged 12-18 years. On the basis of the serosurveys, 91 per cent were protected and 4 per cent had equivocal levels of antibody.
- By far the majority of parents (89 per cent) said they were satisfied with the school Campaign.

6

## Results and strategies for measles elimination



## 6.1 Results

The Measles Control Campaign resulted in a significant increase in the levels of protection against measles among preschool and primary school age children, and averted an estimated 17,500 cases of measles (NCIRS 1999).

The Campaign was very successful in reaching primary school age children, with around 1.7 million or 96 per cent of children this age being vaccinated during the Campaign. More than 1.3 million of these children were vaccinated in the school program in almost 8,800 schools in all States and Territories. A serosurvey conducted after the Campaign showed that 94 per cent of children aged 6-12 years were immune to measles, an increase from 84 per cent before the Campaign. The results of the Campaign for this age group were proportionally equal or better than the measles vaccination program conducted in the United Kingdom in 1994. Parents overwhelmingly reported that they were satisfied with the primary school program (89 per cent), and 87 per cent of parents indicated that they would be willing to have their child vaccinated at school in future programs.

In the preschool group it was estimated that 97.5 per cent of those aged 12-42 months had received their first dose of MMR vaccine, and serology showed that 89 per cent of children aged 2-5 years were protected, a rise from 82 per cent before the Campaign. Approximately 18,000 children who were due or overdue for the first dose of MMR vaccine at the beginning of the Campaign were vaccinated. By far the majority of parents (86 per cent) expressed favourable comments about the Campaign and the reminder letter.

The post-Campaign serosurvey showed that 66 per cent of younger children aged 12-24 months were protected against measles. This relatively low level of protection suggested that young children were not receiving their first dose of MMR vaccine at the recommended age of 12 months. The post-Campaign serosurvey also showed that the level of seropositivity in young people aged 12-18 years who were not directly targeted in the Campaign remained static at 91 per cent before and after the Campaign.

There were 89 serious adverse events that occurred during the Campaign that were assessed as having a causal link to the MMR vaccination. Of these events, 46 were assessed to be certainly caused by the MMR vaccine, 23 were probably caused by the vaccine and 20 were possibly associated with the vaccine. The overall proportion of serious adverse events was 5.2 per 100,000 doses of vaccine administered. This rate was considerably lower than the proportion reported during the measles program in the United Kingdom. There were no deaths associated with the Campaign. The risks associated with MMR vaccination were clearly outweighed by the benefits of vaccination in providing protection against measles, mumps and rubella.

The communications strategy was a highly successful component of the Campaign. The post-Campaign parent survey showed that 96 per cent of parents who had a child vaccinated as part of the Campaign were satisfied with the Campaign. Awareness of the Campaign and of the need to sign a consent form both peaked at 97 per cent during the Campaign. The information pack and the television advertisements had the highest reach of the Campaign elements with up to 88 per cent and 86 per cent of the target group reporting awareness of these elements respectively during the Campaign.

## Achievements

The Campaign was very successful on a number of fronts.

- The Campaign resulted in significant increases in the levels of protection against measles among preschool and primary school age children, and averted an estimated 17,500 cases of measles (NCIRS 1999). The school-based approach to vaccinating primary school children proved very successful, with over 1.3 million children being vaccinated at school.
- A significant challenge in developing and implementing the Campaign was the need to develop effective partnerships between all levels of government, the health profession, the teaching profession and the community. This challenge was met by an unprecedented level of commitment, organisation and cooperation by these players. The extensive consultation process that occurred in the developmental stages of the Campaign and that continued during the Campaign contributed to and enhanced this level of cooperation.
- The Campaign also built on existing immunisation infrastructures at the local level. For the first time, nurses were accredited to provide vaccination programs in all States and Territories. As a result of this effort, there is now a national immunisation workforce highly skilled in implementing and delivering mass or school-based vaccination programs.
- The results of the communication strategy clearly demonstrate the success of this component of the Campaign.

## 6.2 Strategies for measles elimination

### Recommendations for further efforts to control measles in Australia

As outlined in Chapter 6, following on from the evaluation of the Measles Control Campaign, the NCIRS identified that future efforts to eliminate measles in Australia should focus on achieving high levels of coverage from a two-dose strategy and placing an increased effort on surveillance activities. The following three target age groups were identified as in need of special consideration:

- young people aged 12-18 years, among whom deficiencies exist in the levels of immunity to measles, and who were not directly targeted in the Campaign. This group would benefit from a targeted campaign to deliver the second dose of MMR vaccine;
- toddlers, many of whom are not receiving their first dose of MMR on time at 12 months of age. Programs should be implemented to ensure that this dose is administered promptly at 12 months of age; and
- children aged 4-5 years, the age scheduled for the second dose of MMR. Steps should be taken to ensure that uptake of the second dose of MMR among this group is at least 95 per cent.

## **Progress on Elimination Strategies**

To ensure Australia continues to progress towards measles elimination, the Measles Elimination Advisory Committee (MEAC) has overseen the revision of national *Guidelines for the Control of Measles Outbreaks in Australia*.

Where previously these guidelines had focussed on the prevention and response to measles outbreaks, the revised recommendations have incorporated the results and subsequent findings from the Measles Control Campaign to emphasise the requirements for:

- sustained, optimal measles vaccination at twelve months and four years of age, including an effective monitoring and response system for ensuring timely vaccination and identification of susceptible sub-populations;
- enhanced measles surveillance and reporting; and
- capacity and preparedness for rapid control response to measles cases.

### **Vaccination Strategies**

There have been a number of initiatives introduced nationally which actively support increased vaccination uptake and further assist specific efforts in maintaining high measles vaccination coverage.

#### ***The Australian Childhood Immunisation Register (ACIR)***

In addition to its use prior to, and during the Measles Control Campaign, the ACIR is able to monitor measles immunisation rates at the national, state/territory and local level. The ACIR also provides Child History Statements to parents/guardians at key immunisation milestones: 12 months, 24 months and 5 years. The Statement advises parents of the current immunisation details recorded by the ACIR, and also identifies vaccinations missing or overdue, which could prevent their child's record being assessed as 'up-to-date'. Parents as well as immunisation providers may request additional statements at any time.

#### ***Immunisation Incentives for Parents***

An initiative which promotes timely immunisation for vaccines on the recommended immunisation schedule, is the linking of immunisation status to eligibility for childcare benefits. These measures ensure that government subsidies paid for childcare support are only available to parents whose children are age appropriately vaccinated or have a valid exemption.

#### ***Immunisation Incentives for General Practitioners***

The General Practice Immunisation Incentives Scheme provides financial incentives for general practitioners to monitor, promote and provide age appropriate immunisation services to children under the age of seven years in their practice.

The Scheme provides payment for individual vaccination services provided and monitors practice coverage levels as the basis for outcome based tiered bonuses for achieving immunisation coverage of 80% and 90% and greater.

#### ***School entry Immunisation Requirements***

Legislation and regulations governing the requirements for providing documentation on immunisation status prior to commencing school currently exists within four states and territories in Australia.

The Commonwealth government has developed 'model' legislation pertaining to these requirements which will assist in a consistent approach to school entry requirements for immunisation nationally. School entry requirements specifically aid in promoting uptake of the second dose measles vaccination.

### ***Measles Immunisation Targets***

The targets set for national measles vaccination coverage are;

By the year 2001:

- 95 percent coverage of children with one dose of measles containing vaccine by their second birthday; and
- 95 percent coverage of children with at least one dose, and 90 percent with two doses of measles containing vaccine by school entry.

Coverage data released from the Australia Childhood Immunisation Register on 30 June 2000 reported Measles Mumps Rubella vaccination coverage of 91 percent for children aged 24 to 27 months. Second dose measles vaccination coverage figures for children at school entry will be routinely reported by the ACIR from 2001.

### ***Surveillance Strategies***

In addition to improving vaccination levels, Australia's progress towards measles elimination encompasses enhancements in measles surveillance to improve the National Notifiable Diseases Surveillance System's sensitivity to detect every case of measles.

A detailed strategy for measles surveillance (Heath et al 1999) has been endorsed by the Communicable Diseases Network of Australia and New Zealand (CDNANZ) and outlines the elements required for:

- detecting cases and the source of infection rapidly so that timely control measures can be implemented;
- detecting resurgence of indigenous measles transmission;
- detecting importation of measles; and
- monitoring serious complications of measles infection.

These components are being progressed through the education of General Practitioners and other physicians to report suspected cases of measles while awaiting confirmation, active case finding following a confirmed measles case, routine collection of vaccination history as part of the measles surveillance data set, and the routine reporting of notified measles cases in fortnightly teleconferences.

### ***Response Strategy***

*The Guidelines for the Control of Measles Outbreaks in Australia* outline the protocol for rapid response to an outbreak of measles. This includes recommendations for case detection and isolation, contact tracing and post exposure prophylaxis and communication strategies during an outbreak at local, state or national levels.

The primary aim in preventing transmission of measles is the development of the surveillance system so as to detect every case of measles and provide a rapid response to prevent further transmission once a case is detected. The key to achieving this is the reduction of delays from the onset of illness to notification to public health authorities.



# Appendix 1

## Measles Elimination Advisory Committee

MEAC's terms of reference were to consider and recommend strategies for the elimination of measles in Australia and report to the National Centre for Disease Control.

### Membership

Dr Cathy Mead, National Centre for Disease Control (Chair)

Dr Rosemary Lester, Prevention & Child Health, Department of Human Services, Victoria

Dr Jeffrey Hanna, Tropical Public Health Unit, Cairns, Queensland

Dr Mahomed Patel, National Centre for Epidemiology and Population Health

Dr Robert Hall, Communicable Diseases Branch, SA Health Commission

Dr Osman Mansoor, Ministry of Health, New Zealand

Dr Brian Kable, Royal Australian College of General Practitioners

Associate Professor Margaret Burgess, National Centre for Immunisation Research & Surveillance of Vaccine Preventable Diseases

Dr Tim Heath, National Centre for Immunisation Research & Surveillance of Vaccine Preventable Diseases

Dr Eddie O'Brien, National Centre for Disease Control

Dr Bronwen Harvey, National Centre for Disease Control

Ms Sue Campbell-Lloyd, National Measles Campaign Manager

### Report

*Contributors:* Commonwealth Department of Health and Aged Care  
(National Centre for Disease Control, Population Health Social Marketing Unit)

National Centre for Immunisation Research and Surveillance of Vaccine Preventable Diseases

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Ampersand Editorial & Design, Canberra

*Design and desktopping:* Billy Blue

## Appendix 2

### Briefing sessions during consultation

#### New South Wales

Department of Education and Training  
Association of Independent Schools  
Catholic Education Commission  
Australian Council of Parents  
P&C Federation of New South Wales  
New South Wales Parents' Council  
Federation of School Community Organisations

#### Victoria

Association of School Councils  
Association of Second School Principals  
Victorian Council of School Organisations  
Victorian Principals' Federation  
Victorian Primary Principals Association  
Australian Education Union  
Victorian Federation State School Parent Clubs  
National Catholic Education Commission  
Pharmacy Guild of Australia  
Australian Nursing Council  
Australian Local Government Association  
Royal College of Nursing (Australia)  
Pharmaceutical Society of Australia  
Australian Nursing Federation  
Independent Education Union  
Australian Education Union  
Australian Medical Association  
CSL Ltd

#### Queensland

Education Queensland  
Catholic Education Commission  
Association of Independent Schools  
Queensland Council of P&C Associations  
Independent Parents and Friends  
Federation of Parents and Friends Association

#### Western Australia

Education Department of Western Australia  
Association of Independent Schools  
Catholic Education Commission  
P&C Association  
Parents and Friends

<b>South Australia</b>	<p>Independent Schools Board Inc  Catholic Education Office  Interagency Health Care  Independent Schools Parent Council  Association of School Parent Clubs  Primary Principals' Association  Federation of Parents and Friends  Catholic Primary Principals' Association</p>
<b>Tasmania</b>	<p>Association of Independent Schools  Catholic Education Commission  Department of Education, Community &amp; Cultural Development  Catholic Schools Parents and Friends Federation  Australian Council of Parents and Friends Associations  Parents Council of Independent Schools</p>
<b>Australian Capital Territory</b>	<p>ACT Department of Education and Training  Association of Independent Schools  Department Child, Family and Youth Health</p>
<b>Northern Territory</b>	<p>Education Department  Council of Government Schools Association  Christian Schools Association  Manager, Darwin CCC  Manager, Palmerston CCC  Clinical Nurse Consultant, Casuarina CCC  Manager, Casuarina CCC  Community Nurse, Casuarina CCC  Aboriginal Health Worker, DanilaDilba Aboriginal Medical Service  Public Health Nurse, Alice Springs  Director, Integrated Nursing Service, Tennant Creek  Public Health Nurse, Tennant Creek  Child Health Nurse, Tennant Creek  AIDS/STD Educator, Tennant Creek  Accident and Emergency Department, Tennant Creek Hospital  School Health Nurse, Tennant Creek</p>

# Appendix 3

National Consent form (NB: South Australia used the consent form shown on page 97).

## Measles Control Campaign

### Measles Mumps Rubella Vaccination Consent Form

#### Instructions

All parents/guardians to complete Section A.  
Only those parents/guardians who wish to have their child vaccinated to complete and sign Section B.  
All Consent Forms are due to be returned to the school within one week.  
A child will only be vaccinated if the Consent Form is signed in Section B.

#### Section A – Parent/Guardian to complete

##### Child's Details

Child's Family Name:	<input type="text"/>		
Child's Given Names:	<input type="text"/>		
Date of Birth:	<input type="text"/>	Sex:	<input type="text"/>
School:	<input type="text"/>		
State/Territory:	<input type="text"/>		

<b>PARENT'S/GUARDIAN'S RECORD OF VACCINATION</b>	
(This will be returned to parent after vaccination occurs. Do not fill in – for Department of Health use only.)	
VACCINE ADMINISTERED:	<input type="text"/>
DATE VACCINE GIVEN:	<input type="text"/>
VACCINE BATCH NUMBER:	<input type="text"/>

**PLEASE RETURN THIS FORM INTACT TO THE SCHOOL WITHIN ONE WEEK.**

## Vaccination against Measles Mumps Rubella (German Measles).

Dear Parent/Guardian,

It is proposed that the routine recommended immunisation schedule will soon be changed and the second dose of Measles Mumps Rubella (MMR) vaccine, usually given in the last year of primary school or first year of high school, will cease.

Instead, this dose will be recommended prior to school entry, at 4-5 years of age. In preparation for this change and to ensure no child misses out on this vital vaccination against measles, the Commonwealth Government is conducting a one-off Measles Control Campaign to vaccinate all primary school children throughout Australia.

Teams of specially trained registered nurses will conduct free vaccination clinics in primary schools in 1998. If you agree to have your child vaccinated, complete Sections A and B of this **Consent Form** and return it to the school intact within one week of receipt. The front part of the form will be returned to you as a record of vaccination.

If you do not wish to have your child vaccinated at school as part of this campaign, complete Section A only of the Consent Form and return it to the school – so that we can be sure that you have received the Measles Information Pack and have had the opportunity to participate in this campaign.

**If you require assistance to complete this form please call the Immunisation Infoline 1800 671 811.**

## Common reactions to MMR vaccine and what to do about them.

Many children experience some symptoms following vaccination. Most of these only last a short time and the child recovers without any problems.

### COMMON REACTIONS

- Discomfort in the area where injection is given.

The following may occur 5-12 days after immunisation and last less than 48 hours:

- low grade fever
- faint rash (not infectious)
- head cold and/or runny nose
- cough and/or puffy eyes
- swelling of the facial glands may occur about three weeks after immunisation.

### WHAT TO DO

- A cold, wet cloth on the sore spot where the injection was given will help relieve some discomfort.
- give extra fluids to drink
- do not overdress the child if hot
- tepid sponge or tepid bath if hot
- give paracetamol (dose for weight) to lower temperature every 3-4 hours if needed – up to a maximum of six doses in 24 hours. If fever persists consult your doctor or health care provider.

If you have any questions regarding MMR vaccination, please contact your doctor or health care provider or contact your State or Territory Health Department. Please refer to the attached Measles Information Booklet for phone numbers.

**ONLY CHILDREN WITH A SIGNED CONSENT FORM WILL BE VACCINATED.**

## Measles Mumps Rubella (German Measles) Vaccination Consent Form.

### Section B – Parent/Guardian to complete and sign if consenting to vaccination

School:  State:  Class:

#### Child's Details

I hereby give consent for my son/daughter/ward:

Child's Family Name:

Child's Given Names:  Date of Birth:

to receive the three-in-one injection (MMR) against measles, mumps and rubella.

My son/daughter/ward is NOT:

- (a) suffering from an acute fever, with a temperature over 38.5°C;
- (b) suffering from a malignant condition (eg. cancer) or tuberculosis;
- (c) suffering from a disease which lowers immunity (eg. leukemia or HIV/AIDS);
- (d) receiving treatment with a cortisone/prednisone like drug or immunosuppressive therapy including radiation;
- (e) allergic to the antibiotic, neomycin;
- (f) pregnant, or likely to become pregnant within two months of vaccination;

and has NOT HAD:

- (g) an immunoglobulin injection or blood transfusion within the past three months;
- (h) a live vaccine within the past four weeks (eg. BCG (tuberculosis), yellow fever).

If you are unsure about items (a) to (h) above, please discuss with your doctor or health care provider.

I have read and understood the information provided regarding the benefits and possible side effects of the vaccine.

SIGNED:  DATE:

(Parent/Guardian)

Home Address:

Postcode:  Tel: (H)  (W)

**NB:** All children will be checked by the nurses on the day of the clinic and will not be vaccinated if they are suffering an acute illness, with a fever. If any circumstances change after you have signed the Consent Form (eg. medical history has changed, new medication or fever on the day of the clinic) please notify the school.

**PLEASE RETURN THIS FORM INTACT TO THE SCHOOL WITHIN ONE WEEK.**

## Comparison of effects of diseases and vaccines.

DISEASE	EFFECTS OF DISEASE	SIDE EFFECTS OF VACCINE
<b>Measles</b>  Highly contagious virus spread by coughing and nasal droplets. After incubating for 1-2 weeks, the infection causes fever, sore throat, cough, runny nose, itchy eyes, and a red rash that starts on the face and spreads to the rest of the body.	1 in 25 children with measles develops pneumonia and 1 in 2,000 develops encephalitis (inflammation of the brain). For every 10 children who develop measles encephalitis, 1 will die, and up to 4 will have permanent brain damage. About 1 in 25,000 will develop SSPE (brain degeneration) which is always fatal.	About 10% have discomfort, local inflammation or fever. About 1% develop a rash, which is non-infectious. 1 in 1 million recipients may develop encephalitis (inflammation of the brain).
<b>Mumps</b>  Contagious virus spread by saliva. After incubating for 2-3 weeks, the infection causes fever and painful swollen salivary glands.	1 in 200 children develops encephalitis (brain inflammation). 1 in 5 males past puberty develops inflammation of the testicles. Occasionally, mumps causes infertility or deafness.	1 in 100 recipients may develop swelling of the salivary glands. 1 in 3 million recipients will develop a mild encephalitis (brain inflammation).
<b>Rubella</b>  Contagious virus spread by nasal droplets. After incubating for 2-3 weeks, the infection causes fever, headache, itchy eyes, swollen glands behind the ears and neck and a rash.	50% develop a rash and painful swollen glands. 50% of adolescents and adults have painful joints. 1 in 6,000 develops inflammation of the brain. 90% of babies infected during the first 10 weeks after conception will have a major congenital abnormality (such as deafness, blindness, brain damage or heart defects).	About 10% have discomfort, local inflammation or fever. About 5% have swollen glands, stiff neck or joint pains. About 1% have a rash, which is non-infectious.

**If a reaction to the vaccine is severe or persistent or if you are worried about your child, contact your doctor, health care provider or hospital.**

### RECORD OF VACCINATION

(Do not fill in – for Department of Health use only.)

VACCINE ADMINISTERED:

DATE VACCINE GIVEN:

VACCINE BATCH NUMBER:

PROVIDER'S SIGNATURE:

# Appendix 3

South Australian Consent form.

## Measles Control Campaign

### Measles Mumps Rubella Vaccination Consent Form

#### Instructions

All parents/guardians to complete Section A and B.  
(Complete Section B even if you do NOT want to have your child immunised).  
All Consent Forms are due to be returned to the school within one week.  
Your child will only be vaccinated if you tick YES on the Consent Form.

#### Section A – Parent/Guardian to complete

##### Child's Details

Child's Family Name:	<input type="text"/>		
Child's Given Names:	<input type="text"/>		
Date of Birth:	<input type="text"/>	Sex:	<input type="text"/>
School:	<input type="text"/>		
State/Territory:	<input type="text"/>		

<b>PARENT'S/GUARDIAN'S RECORD OF VACCINATION</b>	
(This will be returned to parent after vaccination occurs. Do not fill in – for Department of Human Services use only.)	
VACCINE ADMINISTERED:	<input type="text"/>
DATE VACCINE GIVEN:	<input type="text"/>
VACCINE BATCH NUMBER:	<input type="text"/>

**PLEASE RETURN THIS FORM INTACT TO THE SCHOOL WITHIN ONE WEEK.**



## Vaccination against Measles Mumps Rubella (MMR).

Dear Parent/Guardian,

It is proposed that the routine recommended immunisation schedule will soon be changed and the second dose of Measles Mumps Rubella (MMR) vaccine, usually given in the last year of primary school or first year of high school, will cease.

Instead, this dose will be recommended prior to school entry, at 4-5 years of age. In preparation for this change and to ensure no child misses out on this vital vaccination against measles, the Commonwealth Government is conducting a one-off Measles Control Campaign to vaccinate all primary school children throughout Australia.

Teams of specially trained registered nurses will conduct free vaccination clinics in primary schools in 1998. If you agree to have your child vaccinated, complete Sections A and B of this **Consent Form** and return it to the school **intact** within one week of receipt. The front part of the form will be returned to you as a record of vaccination.

If you do not wish to have your child vaccinated at school as part of this campaign, still complete Sections A and B of the Consent Form, making sure you tick the appropriate boxes, and return it to the school. This way we can be very sure that we are following your wishes. It is also important for us to know you have received the Measles Information Pack.

**If you require assistance to complete this form please call the Immunisation Infoline 1800 671 811.**

## Common reactions to MMR vaccine and what to do about them.

Many children experience some symptoms following vaccination. Most of these only last a short time and the child recovers without any problems.

### COMMON REACTIONS

- Discomfort in the area where injection is given.

The following may occur 5-12 days after immunisation and last less than 48 hours:

- low grade fever
- faint rash (not infectious)
- head cold and/or runny nose
- cough and/or puffy eyes
- swelling of the facial glands may occur about three weeks after immunisation.

### WHAT TO DO

- A cold, wet cloth on the sore spot where the injection was given will help relieve some discomfort.
- give extra fluids to drink
- do not overdress the child if hot
- tepid sponge or tepid bath if hot
- give paracetamol (dose for weight) to lower temperature every 3-4 hours if needed – up to a maximum of six doses in 24 hours. If fever persists consult your doctor or health care provider.

If you have any questions regarding MMR vaccination, please contact your doctor or health care provider or contact your State or Territory Health Department. Please refer to the attached Measles Information Booklet for phone numbers.

**ONLY CHILDREN WITH A SIGNED CONSENT FORM WILL BE VACCINATED.**

South Australian Consent form.

## Measles Mumps Rubella (MMR) Vaccination Consent Form.

### Section B – Parent/Guardian to complete and sign if consenting to vaccination

#### Child's Details

Child's Family Name: Child's Given Name: Date of Birth: School: Class: 

#### My son/daughter/ward is NOT:

- (a) suffering from an acute fever, with a temperature over 38.5°C;
- (b) suffering from a malignant condition (eg. cancer) or tuberculosis;
- (c) suffering from a disease which lowers immunity (eg. leukemia or HIV/AIDS);
- (d) receiving treatment with a cortisone/prednisone like drug or immunosuppressive therapy including radiation;
- (e) allergic to the antibiotic, neomycin;
- (f) pregnant, or likely to become pregnant within two months of vaccination;

#### and has NOT HAD:

- (g) an immunoglobulin injection or blood transfusion within the past three months;
- (h) a live vaccine within the past four weeks (eg. BCG (tuberculosis), yellow fever).

If you are unsure about items (a) to (h) above, please discuss with your doctor or health care provider.

**I have read and understood the information provided regarding the benefits and possible side effects of the three-in-one injection against measles, mumps and rubella (MMR). Please tick.**

- **YES** I do consent for my child/ward to receive the MMR vaccine.
- **NO** I do not consent for my child/ward to be immunised with MMR vaccine because:

(please tick the appropriate box).

- ☐ a) my child/ward has already received a second dose of MMR on \_\_\_\_\_ (date).
- ☐ b) my child/ward will not be present that day;
- ☐ c) my child/ward will have the immunisation dose elsewhere;
- ☐ d) my child/ward is medically unfit due to \_\_\_\_\_ (reason).
- ☐ e) I object to immunisations;
- ☐ f) Other reason \_\_\_\_\_ (please state).

Do you agree to being contacted by an immunisation nurse if further information is needed? Yes/No

Signed: 

(Parent/Guardian)

Date: Home Address: Postcode: Tel: (H) (W) 

**NB: All children will be checked by the nurses on the day of the clinic and will not be vaccinated if they are suffering an acute illness, with a fever. If any circumstances change after you have signed the Consent Form (eg. medical history has changed, new medication or fever on the day of the clinic) please notify the school.**

**PLEASE RETURN THIS FORM INTACT TO THE SCHOOL WITHIN ONE WEEK.**

Comparison of effects of diseases and vaccines.

DISEASE	EFFECTS OF DISEASE	SIDE EFFECTS OF VACCINE
<b>Measles</b>  Highly contagious virus spread by coughing and nasal droplets. After incubating for 1-2 weeks, the infection causes fever, sore throat, cough, runny nose, itchy eyes, and a red rash that starts on the face and spreads to the rest of the body.	1 in 25 children with measles develops pneumonia and 1 in 2,000 develops encephalitis (inflammation of the brain). For every 10 children who develop measles encephalitis, 1 will die, and up to 4 will have permanent brain damage. About 1 in 25,000 will develop SSPE (brain degeneration) which is always fatal.	About 10% have discomfort, local inflammation or fever. About 1% develop a rash, which is non-infectious. 1 in 1 million recipients may develop encephalitis (inflammation of the brain).
<b>Mumps</b>  Contagious virus spread by saliva. After incubating for 2-3 weeks, the infection causes fever and painful swollen salivary glands.	1 in 200 children develops encephalitis (brain inflammation). 1 in 5 males past puberty develops inflammation of the testicles. Occasionally, mumps causes infertility or deafness.	1 in 100 recipients may develop swelling of the salivary glands. 1 in 3 million recipients will develop a mild encephalitis (brain inflammation).
<b>Rubella</b>  Contagious virus spread by nasal droplets. After incubating for 2-3 weeks, the infection causes fever, headache, itchy eyes, swollen glands behind the ears and neck and a rash.	50% develop a rash and painful swollen glands. 50% of adolescents and adults have painful joints. 1 in 6,000 develops inflammation of the brain. 90% of babies infected during the first 10 weeks after conception will have a major congenital abnormality (such as deafness, blindness, brain damage or heart defects).	About 10% have discomfort, local inflammation or fever. About 5% have swollen glands, stiff neck or joint pains. About 1% have a rash, which is non-infectious.

If a reaction to the vaccine is severe or persistent or if you are worried about your child, contact your doctor, health care provider or hospital.

RECORD OF VACCINATION  
(Do not fill in – for Department of Human Services use only.)

VACCINE ADMINISTERED:

DATE VACCINE GIVEN:

VACCINE BATCH NUMBER:

PROVIDER'S SIGNATURE:

## Appendix 4

### Data collection form

#### Measles Control Campaign 1998

##### Primary School data collection sheet

The Measles Control Campaign aims to reduce the incidence of measles in Australia. One part of this campaign is to offer MMR (measles/mumps/rubella) immunisation to every primary school child in the second half of 1998. Collecting information about the number of children who were immunised will be an important part of the evaluation of the Campaign. This form has been designed to collect this information.

This is an example of how to complete the table on the form: In school year 5, there are a total of 125 children. Forms identifying data (section A) were returned by parents/guardians for 120 children. Of these 120 forms, 112 had part B (consent to vaccination) completed. 107 children were immunised at the school on the day the immunisation team visited. There is no need to record absent children.

Year/Grade	Total Students	Forms Returned (Section A completed)	Consents to Vaccination (Section B completed)	Students Immunised
5	125	120	112	107

There are number of things to remember when completing this form:

- Each Year or Grade in the primary school should be entered in the first column, identifying each class by a number (1, 2, 3,...) or by a letter (eg K, 1, 2, ...). For composite classes use the identifier used by the school (eg 1/2, 2/3 ...)
- Total Students = the number of students enrolled in each Year/Grade (not only the students present on the campaign day).
- Forms Returned = the number of forms returned by the Year/Grade with the section A completed (whether or not the parent/guardian has consented to vaccination).
- Consents to Vaccination = the number of children in the Year/Grade who have consented to vaccination (section B completed).
- Students Immunised = the number of children in that Year/Grade immunised at the school on the campaign day.
- Date of Campaign = the date that the school was vaccinated. Use the date format day/month/year.
- MMR Batch Number = the batch number of MMR vaccine used to immunise the children. The same batch of MMR should be used for the entire Year/Grade.
- Some states/territories intend performing a “mop-up” program to immunise those

children who had consented but were missed at the initial school visit. This form can record information for these mop-up visits. To do this, the mop-up box must be ticked, and the form should only record information which has become available since the original immunisation day for that school. For example, the total number of children is already recorded, so leave that field blank. In the “forms returned” and “consents to vaccination” fields enter only the number of consents received since the original form was completed. Enter the number of children immunised on the mop-up day in the “students immunised” field.

A member of the Immunisation Team visiting the school must complete this form, and at the end of the day, facsimile completed forms to:

State/Territory Measles Control Campaign Coordinator

Measles Control Campaign

Primary School Data Collection Form

State/Territory:School ID number:

School name:

School address:

School Postcode:

School telephone number:

Completed by (Immunisation Team member):

MMR batch number:Date of campaign:

This is a report of a **mop-up** program    yes ☐

Year/ Grade	Total Students	Forms Returned (Section A Completed)	Consents to Vaccination (Section B Completed)	Students Immunised

# Appendix 5

## Adverse events: definitions and assessment of causality

### Definitions of adverse events

#### Allergic reaction

Characterised by one or more of the following:

- skin manifestations (eg hives, eczema, pruritus);
- wheezing or shortness of breath due to bronchospasm; and/or
- facial or generalised oedema.

#### Anaphylactoid reaction (acute hypersensitivity reaction)

Exaggerated allergic reaction, occurring within 2 hours of vaccination, characterised by one or more of the following:

- wheezing and shortness of breath due to bronchospasm;
- laryngospasm/laryngeal oedema; and/or
- one or more skin manifestations eg hives, facial oedema, generalised oedema.

#### Anaphylaxis

Circulatory failure (eg alteration of the level of consciousness, low arterial blood pressure, weakness or absence of peripheral pulses, cold extremities secondary to reduced peripheral circulation, flushed face and increased perspiration) occurring within minutes of vaccination with or without bronchospasm and/or laryngospasm/laryngeal oedema.

#### Arthralgia

Joint pain without redness or swelling.

#### Arthritis

Joint pain together with redness and/or swelling.

#### Encephalopathy

Diagnosis must be made by a physician.

Encephalopathy is an acute onset of major neurological illness temporally linked with vaccination and characterised by any two or more of the following three conditions:

- seizures;
- severe alteration in level of consciousness or mental status (behaviour and /or personality) lasting for one day or more; and/or
- focal neurological signs which persist for one day or more.

#### Encephalitis

Diagnosis must be made by a physician.

Encephalitis is characterised by the above mentioned symptoms and signs of cerebral inflammation and, in many cases, cerebrospinal fluid pleocytosis and /or virus isolation.

**Fever**

Only very high fever should be reported (eg over 40.5°C).

**Local reaction (severe)**

Redness and/or swelling centred at the site of injection and one or more of the following:

- swelling beyond the nearest joint;
- pain, redness and swelling of more than three days duration; and/or
- requires hospitalisation.

**Lymphadenitis (includes suppurative lymphadenitis)**

Occurrence of either:

- at least one lymph node, 1.5cm in diameter or larger; or
- a draining sinus over a lymph node.

Almost exclusively caused by BCG (bacille Calmette-Guerin) vaccine on the same side as inoculation (mostly axillary).

**Parotitis**

Swelling and/or tenderness of parotid gland or glands.

**Rash**

Severe or unusual rash.

**Seizures**

Seizures lasting from several minutes to more than 15 minutes and not accompanied by focal neurological signs or symptoms:

- febrile seizures (with fever >37.5°C);
- afebrile seizures (without fever).

**Syncope**

A temporary suspension of consciousness due to cerebral anaemia.

**Syncopal fits**

Tonic/clonic seizure or incontinence occurring in association with syncope.

**Thrombocytopenia**

Decrease in the number of platelets in circulating blood.

**Other severe or unusual events**

Any unusual event that does not fit into any of the categories listed above, but was of medical or epidemiological interest should be reported with a detailed description of the clinical features.

## **Assessment of causality**

The panel used the basic ADRAC criteria to determine the causal link to the MMR vaccine for each of the adverse events following vaccination assessed. The criteria used was consistent with international criteria (WHO), and is as follows:

### **Certain**

- confirmed by rechallenge; and /or
- confirmed by laboratory data; and/or
- reaction onset is immediately following drug/vaccine administration (within 60 minutes if injections was the method of administration); and/or
- precise spatial correlation with administration (eg at the exact site of injection).

### **Probable**

- temporal or spatial (eg skin) correlation with administration; and/or
- recovery on withdrawal of the drug if no other drug is withdrawn and no therapy given; and/or
- an uncommon clinical phenomenon associated with the administration of the drug/vaccine in the absence of other factors.

### **Possible**

- a possible alternative explanation exists; and/or
- more than one drug/vaccine is suspected; and /or
- data are incomplete; and/or
- recovery follows withdrawal of more than one drug/vaccine; and /or
- time relationship is not clear; and/or
- outcome of the reaction is not recorded; and/or
- recovery follows therapy in addition to withdrawal of the drug/vaccine.

### **Unclear**

This classification is accorded where a clinical event may well be explained as arising from factors related to underlying disease, or other non-vaccine aetiology. Reports given this classification are not used in further evaluation or statistical studies. However, they are held in case future developments alter their significance.



## Abbreviations and acronyms

ABS	Australian Bureau of Statistics
ACIR	Australian Childhood Immunisation Register
ADRAC	Australian Drug Reaction Advisory Committee
CHERE	Centre for Health Economics Research and Evaluation
CI	confidence interval
DHFS	Commonwealth Department of Health and Family Services
DTP	diphtheria, tetanus, pertussis
EIA	enzyme immunoassay
ESL	English spoken as a second language
GP	general practitioner
IgG	immunoglobulin G
IU	international units
MEAC	Measles Elimination Advisory Committee
mL	millilitre
MMR	measles, mumps, rubella
NCDC	National Centre for Disease Control
NCIRS	National Centre for Immunisation Research and Surveillance of Vaccine Preventable Diseases
NHMRC	National Health and Medical Research Council
NS	non-significant
PAHO	Pan-American Health Organization
PRN	plaque reduction neutralisation
SSPE	sub-acute sclerosing panencephalitis
WHO	World Health Organization

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