

# 1998 CHURCHILL FELLOWSHIP REPORT

*November 1999*

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Immunisation programs in NZ, USA, Canada, UK and Finland:  
lessons for Australia and South Australia



*Ann Kempe*  
*(Churchill Fellow 1998)*

*“When you feel you cannot continue in your position for another minute, and all that is in human power has been done, that is the moment when the enemy is most exhausted, and when one step forward will give you the fruits of the struggle you have borne”.*

(Winston Churchill, 3 March 1910)



PHOTO: Statue of Sir Winston Churchill, Churchill House, Canberra

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The Winston Churchill Memorial Trust of Australia who funded almost all of the costs of my study tour;

Dr Kerry Kirke (Executive Director, Public and Environmental Health Services, SA Health Commission in 1997), who supported my salary while I was away and provided a reference to support the professional merit of my application for the Churchill Fellowship.

Dr Cathy Mead (Head of National Centre for Disease Control, Commonwealth Department of Health and Family Services, Canberra in 1997), who provided a reference to support the merit of a Churchill Fellowship to study immunisation programs for Australia and SA.

Dr Jeff Hanna (Medical Director, Tropical Public Health Unit, Cairns, Queensland), who provided a character reference for my application.

I interviewed over 100 people during the three months of my Fellowship and it is impossible to list them all here. Their names are listed in Part 3 of this report. However there are a few people who deserve special mention for the extra support they gave me. They include Dr Osman (Ossi) Mansoor, Dr Stewart Reid, Dr Nikki Turner and Ms Alison Leadley in New Zealand; Professor Roger Bernier, Dr Robert Chen, Dr Ciro de Quadros, Mrs Irene Sandvold and Ms Sandra Cox in the USA; Dr Philippe Duclos, Ms Margaret Litt, Dr Theresa Tam, and Mr William Mindell in Canada; Dr David Salisbury, Dr Norman Begg, Ms Marie Rush, Mr Michael Corr, Mr Max Evans, Ms Judith Moreton (London), Ms Rhonwen Morris (Gloucester), Dr Roland Salmon, Ms Jean Bannister and Dr Meirion Evans (Cardiff), Dr Ian Jones (Glasgow) in the UK; Mr Roy Widdus, Mr Hans Everts (Geneva) in Switzerland; and Dr Kari Lankinen and Mrs Kirsti Saarela (Helsinki) in Finland. These people not only gave me the benefit of their professional expertise and experience but in many cases, offered me some social and cultural experience of their countries.

The Department of Human Services in South Australia gave me permission to be absent from work for three months and continued to pay my salary during this time.

My partner, Dr Robert Hall who remain calm at all times while I prepared for my trip and who watered the garden and kept the “lamp burning at home” while I was away.

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## 2. EXECUTIVE SUMMARY

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### **PROJECT DESCRIPTION**

The investigation of key areas in immunisation program management and education in NZ, USA, Canada, UK and Finland. Evaluation of those aspects of the chosen immunisation programs that may have an impact on improving vaccine uptake and quality of services for the South Australian and Australian immunisation programs. The visit to the World Health Organization in Geneva (Switzerland), was self funded.

## 2.1 HIGHLIGHTS OF THE FELLOWSHIP STUDY TOUR

I interviewed over 100 people during the 3 month study period. Below is a summary of the most valuable contacts and the highlights of the places visited by country:

### 2.1.1. *New Zealand*

I interviewed Dr Osman (Ossi) Mansoor (public health physician at the Ministry of Health in Wellington); Dr Stewart Reid (general practitioner and chair of the NZ Immunisation Technical Advisory Group in Wellington), Dr Nikki Turner (Director of the Immunisation Advisory Centre in Auckland) and Ms Alison Leadley (Local Immunisation Coordinator at the Primary Health Care Service in Auckland).

### 2.1.2 *USA*

#### **Centers for Disease Control and Prevention (Atlanta)**

There were many highlights. I interviewed most of the influential people in the National Immunisation Program including Professor Roger Bernier (Associate Director for Science for the Program), Dr Robert Chen (Chief of Vaccine Safety), Mr Dean Mason (Chief of Program Support), Mr Dennis O'Mara (Chief of Program Operations) and Ms Shaunette Crawford (Chief of the Community Outreach and Planning Branch).

#### **Washington (DC)**

I interviewed Dr Ciro de Quadros (Director of the Special Program for Vaccines and Immunization of the Pan American Health Organization). At the US Department of Health and Human Services I interviewed Dr Peter Van Dyck (Senior Medical Advisor and States System Director), and Dr Geoffrey Evans (Chief Medical Officer of the National Vaccine Injury Compensation Program); and at the Maryland Department of Health and Mental Hygiene I interviewed Ms Sandra Cox (local Immunisation Coordinator for Montgomery County).

### 2.1.3 *Canada*

I interviewed Dr Philippe Duclos, Ms Margaret Litt and Dr Theresa Tam at the Laboratory Centre for Disease Control in Ottawa.

### 2.1.4 *UK*

I interviewed Dr David Salisbury (Principal Medical Officer, Immunisation and Communicable Diseases at the Department of Health); at the Communicable Diseases Surveillance Centre of the Public Health Laboratory Service I interviewed Dr Norman Begg (Consultant Epidemiologist), Ms Marie Rush (Manager of the COVER System). At the Health Education Authority I interviewed Mr Michael Corr (Program Manager); and at the Farillon vaccine distribution centre I interviewed Mr Max Evans. In Oxford I interviewed Ms Judith Moreton (District Immunisation Coordinator); in Cardiff I interviewed Dr Roland Salmon (Consultant Epidemiologist) and Dr Meirion Evans (Immunisation Coordinator for Wales). In Scotland I interviewed Dr Ian Jones (Director of the Scottish Centre for Infection and Environmental Health).

### 2.1.5 *Switzerland*

I spent all of the visit with people from the World Health Organization, Global Program for Vaccines. They included Mr Roy Widdus (Coordinator for the Children's Vaccines Initiative) and Mr Hans Everts, head of Vaccine Supply and Quality.

### 2.1.6 *Finland*

I spent most of my time in the Department of Vaccines at the National Public Health Institute and I interviewed Dr Kari Lankinen (Senior Scientist) and others. I also visited Mrs Kirsti Saarela who is the immunisation nurse in one of the clinics in outer Helsinki.

## 2.2 MAJOR LESSONS LEARNED

While I gained much new knowledge about international immunisation programs, I found that my experiences confirmed what I already knew about program management and coordination. The main lessons I learned from the study tour were:

- The core activities or components of all immunisation programs must be articulated and understood by those who are part of the system;
- The core activities or components of effective immunisation programs include:
  - ❖ Effective systems of service delivery, so people can access the recommended vaccines. This includes a need to ensure special and appropriate services are available which target overdue or high risk children, with a recognition that these special services may be more expensive;
  - ❖ Cost-efficient service delivery and vaccine funding systems which ensure that the consumer does not have to pay for immunisation. Vaccines should be delivered to the door of the vaccine providers in a way that maintains vaccine potency. Vaccine prices should be negotiated nationally to keep the prices low. Vaccine purchase and distribution systems can be either national or state-based. There should be attention to the quality management of cold-chain as a central part of the process;
  - ❖ Systems to measure the performance, quality and outcomes of the program with timely feedback of data and other information to immunisation providers and managers. There should be a consistent approach to disease surveillance. There must be national or state/regional strategies for tracking children and measuring vaccination coverage, and computerised vaccine registers are the best way to achieve this. Both passive and active surveillance of adverse events following immunisation are essential. Feedback and publication of vaccine safety data should occur to maintain public and professional confidence in the program. Risk communication is part of this process;
  - ❖ Education strategies for the public and for vaccine providers which are evidenced-based and integrated with the rest of the program. They must be sustainable and not implemented in an ad hoc fashion. Multiple strategies are more effective than single strand strategies. Electronic multi-media technology can be used to ensure cost-effective education strategies that overcome the barriers of distance;
  - ❖ An integrated system to purchase, supply and distribute effective (potent) vaccines;
  - ❖ Immunisation management systems which ensure vertical coordination (between national, state or regional, and local levels of the program) and within levels (eg between providers at the local level). Collaborative relationships throughout the system between public and private sectors should occur. Local management and coordination is just as important as state and national management of the program.

- Needs assessment or ‘mapping’ of the immunisation system is crucial so gaps can be identified. From this strategies can be planned and implemented to build and maintain the necessary program infrastructure;
- There must be a commitment to build the necessary infrastructure;
- Evaluation of performance and outcomes of the program should occur;
- There must be political and resource commitment to ensure active management of all levels of the immunisation system. All components of the immunisation system must be linked. The program must be coordinated between each of the levels of the system (vertical coordination and management) and between stake-holders within each level (horizontal management and coordination);
- Funding must be tied to demonstrated performance and outcomes of the program. These outcomes must include quantitative aspects (eg immunisation coverage, disease rates, rates of adverse events, etc) as well as the quality aspects (eg education of health professionals, vaccine adverse events surveillance, cold chain monitoring etc). Accountability at every level of the system is most important especially when resources are scarce;
- The use of normative incentives can be as powerful as financial incentives to motivate immunisation service providers to improve quality of service and to improve vaccine uptake;
- Computerisation is essential in service delivery sites for the collection of notification, vaccination and adverse events data, and to more effectively recall overdue children. These computerised data should be used by program managers;
- There should be a close working relationship between the public and private sectors throughout the system;
- Feedback of results (eg vaccine coverage etc) must be carried out regularly and in a timely fashion to vaccine service providers;
- Innovative but effective education strategies should be implemented for health professionals in order to keep them up to date with the rapid changes in immunisation recommendations;
- National clinical guidelines must be made on the basis of scientific knowledge. Effective and efficient strategies must be found to tap the available knowledge of experts;
- Wide communication of the successes and failures of the program is necessary and the public must be reminded about the scientific foundations of the program. We should do not be defensive with the ‘anti-immunisation lobby’ but deal with them in an open, scientific and proactive way;
- Legislation to compensate individual/families injured by vaccines is necessary. It is an ethical and honest way to improve public confidence in immunisation while supporting those of the community damaged by vaccines while the rest of the community reap the benefits of immunisation;
- Use the best available electronic technology to monitor the cold-chain in the field and implement audits on vaccine wastage. Savings which can be made through this process should be reinvested into other parts of the system; and
- Local immunisation coordinators who are technically competent and who make regular practice visits constitute one of the most effective strategies to increase knowledge and communicate with doctors so they can be kept up to date with immunisation.

### **2.3 HOW THIS KNOWLEDGE IS BEING DISSEMINATED AND HOW THE LESSONS LEARNED ARE BEING IMPLEMENTED**

I am able to implement changes, both nationally and in SA, through my position as the SA Immunisation Coordinator with the Department of Human Services. The study tour has confirmed that many of the projects I had started in SA are in line with international best practice. Many of the immunisation projects I have instigated in SA over the past 3 years are in some way linked to the findings from my Churchill study tour.

In SA we have extended immunisation infrastructure. We have implemented Local Immunisation Coordinator positions - these are the first of their kind in Australia. SA now has the highest proportion of fully immunised children in the 18 month age-group (representing an increase of 25% since 1995).

I have strengthened the horizontal and vertical links for which I am responsible within the SA Immunisation Program.

I have given a number of conference papers here and in New Zealand since my return to describe the lessons learned and to advocate changes.

I continue to work through my position as the SA representative on the National Immunisation Committee to implement many of the recommendations I have listed above.

As a member of the Australian Technical Advisory Committee on Immunisation, I am in a position to influence the Australian clinical guidelines for the immunisation program to make the best use of information from overseas relevant for Australia.

I am a member of the Public Health Association National Immunisation Conference organising committee. The next national immunisation conference will take place in 2000. I hope that one or two of the international guest speakers will be experts I met during my study tour. I will also be presenting a number of conference papers to highlight the most important aspects of my Churchill Fellowship study tour. This conference usually attracts a wide audience through the media and the conference recommendations will be sent to the federal and state Ministers of Health.

I plan to publish a number of papers in the professional literature based on the lessons I have learned from the Churchill Fellowship.

Finally I plan to send a copy of this report to federal and State Ministers of Health in the hope it may directly influence future health planning on immunisation issues for Australia.

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### 3. CHURCHILL FELLOWSHIP ITINERARY (1 MAY - 3 AUGUST 1998)

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I visited and interviewed the people listed below.

#### **3.1 NEW ZEALAND**

##### *3.1.1 Wellington ~ 1 - 10 May (9 days)*

###### **Ministry of Health**

Dr Osman (Ossi) Mansoor, public health physician

###### **Roparta Medical Clinic**

Dr Stewart Reid, general practitioners and Chair of the NZ Immunisation Technical Advisory Group

###### **Hutt Valley Health**

Dr Jane O'Hallahan, Medical Officer of Health for Wellington

Ms Mary Ryan, Public Health Nurse

###### **Institute of Environmental Science and Research (ESR)**

Dr Helen Heffernan, Managing Scientist

Dr Michael Baker, Public Health Physician

Ms Yvonne Gallaway, Surveillance – Technical Aspects

Ms Anne McNicholas, Epidemiology Group

##### *3.1.2 Auckland ~ 10 - 14 May (3 1/2 days)*

###### **Starship Children's Hospital**

Professor Diane Lennon, Professor of Paediatrics and member of NZ Immunisation Technical Advisory Group

###### **Auckland University Medical School**

Dr Nikki Turner, Director, Immunisation Advisory Centre (ImAC)

###### **Primary Health Care Services**

Ms Alison Leadley, Immunisation Coordinator

###### **Plunket Society**

Ms Colleen Fakalogatoa, Regional Nurse Specialist

## 3.2 USA

### 3.2.1 Atlanta (Georgia) ~ 14 - 30 May (15 days)

#### **Centers for Disease Control and Prevention**

Professor Roger Bernier, Associate Director for Science, National Immunization Program.  
Professor Bernier was my host at CDC.

Professor Walt Orenstein, Director, National Immunization Program

Dr Dixie Snider, Assistant Surgeon General USA, Associate Director of Science for CDC, Chair,  
Advisory Committee on Immunization Practices (ACIP)

Dr Pam Change, Epidemiology and Surveillance Division

Dr Robert Chen, Chief, Vaccine Safety and Development Activity

Ms Gina Terracciano, Vaccine Adverse Events Research and Surveillance (VAERS), Vaccine  
Safety and Development Activity

Ms Beth Hibbs, Risk Communication, Vaccine Safety and Development (VARICO)

Mr Frank Destefeno, Data Linkage Project, Vaccine Safety and Development

Mr Kevin Malone, Senior Attorney for CDC and Director Legal Branch

Mr Dean Mason, Chief, Program Support Branch

Mr Dennis O'Mara, Chief, Program Operations

Mr Joe Beaver, Trainer for the Education Branch (I interviewed Joe instead of the planned  
interview with Mr Bill Atkinson, Director Training and Education)

Mr Eugene (Gene) Dine, Immunisation Services (AFIX)

Mr Robert Linkins, Systems Development Branch (CASA)

Ms Shaunette Crawford, Community Outreach and Planning Branch

Ms Susan Chiew, Associate Senior Scientist, Office of the Director

Mr Jay Watson, Immunisation Services Division

#### **Georgia State Immunisation Program**

Dr Mike Chaney, Program Manager, Georgia State Immunization Coordinator

Ms Deborah Jelks, Assistant Program Manager

### 3.2.2 Washington (DC) ~ 30 May - 6 June (6 days)

#### **Pan American Health Organization**

Dr Ciro A de Quadros, Director Special Program for Vaccines and Immunization

Dr Jose DeFabio, Vaccine Research and Development and Quality Control

Dr Bradley Hersch, Measles and Rubella Elimination

Mr Fernando Vargas, Data Management

Mr Peter Carrasco, Vaccine Logistics

#### **US Department of Health and Human Services**

Dr Peter Van Dyck, Senior Medical Adviser and States System Director

Dr Marie Mann, Director, Maternal and Child Health Bureau

Ms Irene Sandvold, Advanced Nurse Education, Division of Nursing

Dr Geoffrey Evans, Chief Medical Officer, National Vaccine Injury Compensation Program

**Washington, DC, Commission of Public Health**

Dr Matin Levy, Head of the Commission of Public Health for the City of Washington

Dr Jim Giandelis, Program Manager, Immunization, for the City of Washington

**Center for Immunization, Maryland Department of Health and Mental Hygiene**

Dr Barry Trostel, Assistant Chief for Center for Immunization

Dr Edward Hirshorn, Chief, Division of Field Services

Ms Sandra Cox, Immunization Coordinator, Montgomery County, Maryland

### 3.3 CANADA

#### 3.3.1 Ottawa ~ 6 - 15 June (9 days)

**Laboratory Centre for Disease Control**

Dr Philippe Duclos, Chief, Division of Immunization

Ms Margaret Litt, Nurse Epidemiologist, Division of Immunization

Dr Theresa Tam, Field Epidemiologist, Division of Immunization

Dr Robert Pless, Head, Vaccine-Associated Adverse Events Surveillance (VAERS) Section, Division of Immunization

#### 3.3.2 Toronto ~ 15 - 22 June (7 days)

**Ontario Ministry of Health**

Dr Monika Naus, public health physician and Manager, Disease Control

Dr Kirsten Rottensten, Senior Medical Consultant, Vaccine Preventable Diseases and TB Control

**Public Health Division, City of Toronto**

Mr William Mindell, Director of Health Services

Ms Jann Houston, Registered Nurse, Manager, Communicable Disease and Epidemiology Service

### 3.4 UK

#### 3.4.1 London ~ 23 June - 1 July (8 days)

**Immunisation and Communicable Disease Branch, UK Department of Health**

Dr David Salisbury, Principal Medical Officer

Ms Helen Campbell, Senior Scientific Officer

**Institute for Child Health**

Dr Helen Bedford, Senior Research Fellow, Department of Epidemiology and Public Health

Immunisation Division, Communicable Disease Surveillance Centre

Dr Norman Begg, Consultant Epidemiologist

Mr Mary Ramsey, Consultant Epidemiologist

Dr Joanne White, Principal Scientist, COVER

Dr Nigel Gay, mathematical modeller

Mary Rush, Nurse Epidemiologist, Manager, COVER

*3.4.2 London ~ 9 - 14 July (5 days)*

**Farillon Pharmaceutical Distribution**

Mr Max Evans, Director

Mr Nick Pople, Manager

**Immunisation Section, Health Education Authority**

Mr Michael Corr, Program Manager

Ms Joanne Yarwood, Project Manager, Professional Education

Mr Zoltan Bozoky, Project Officer, Tracking Surveys (Community Education)

Mr Steven Thorgood, Advertising Manager

Ms Patricia Tweed, Press Liaison

*3.4.3 Gloucester ~ 1 - 5 July (5 days)*

**Public Health Laboratory (South and West UK)**

Dr James Stuart, Regional Epidemiologist, Communicable Disease Surveillance and Control

**Gloucester Royal Hospital**

Ms Rhonwen Morris, Specialist Health Visitor

**Gloucestershire Health Authority**

Dr David Hunt, Immunisation Coordinator

Mrs Carol Bodken, Data Manager, Child Health System

*3.4.4 Cardiff (Wales) ~ 5 - 9 July (4 days)*

**Communicable Disease Surveillance Centre (Welsh Unit)**

Dr Roland Salmon, Consultant Epidemiologist

Dr Daniel Thomas, Senior Scientist

**Cardiff Health Authority**

Dr Meirion Evans, Communicable Disease Control Consultant, Immunisation Coordinator (Welsh Unit)

**Welsh Common Health Authority**

Dr John King, Data Manager, Child Health System

**Brynderwen Surgery (St Mellons)**

Ms Jean Bannister, Practice Nurse

Dr Celia Thomas, general practitioner

**Trowbridge Community Health Centre**

Dr Robinson, general practice trainee

*3.4.5 Oxford ~ 13 July (1 day)*

**Oxfordshire Community National Health Service Trust:**

Ms Judith Morton, District Immunisation Coordinator

*3.4.6 Glasgow and Dundee (Scotland) ~ 26 - 28 July (2 days)*

**Scottish Centre for Infection and Environmental Health**

Dr Ian Jones, Director

**Greater Glasgow Health Board**

Dr Syed Ahmed, Consultant in Public Health Medicine and Immunisation Coordinator

**Tayside Health Board**

Dr Mike Roworth, Consultant in Public Health Medicine, Immunisation Coordinator

*3.4.7 Edinburgh (Scotland) ~ 28 July - 2 August (5 days)*

**Scottish Office Department of Health**

Dr Barbara Davis, Consultant, Scottish Office

**3.5 SWITZERLAND**

(This leg of my trip was self-funded)

*3.5.1 Geneva ~ 14 - 18 July (4 days)*

**World Health Organization**

Mr Peter Evans, Chief Vaccine Supply and Quality (VSQ)

Dr Julie Melstien, VSQ

Mr Michael Zaffran, VSQ

Mr Hans Everts, VSQ

Mr John Lloyd, VSQ

Dr Peter Lambert, Chief, Vaccine Research and Development (VRD)

Dr John Clements, Adverse Events Surveillance

Mr Roy Widdus, Coordinator, Children's Vaccine Initiative (CVI), UNICEF

## 3.6 FINLAND

### 3.6.1 Helsinki ~ 18 - 26 July (7 days)

#### **Department of Vaccines, National Public Health Institute (KTL)**

Dr Kari Lankinen, Senior Scientist

Mr Pirjo-Riita Saranpää

Mr Tapani Kuronen, Vaccine Distribution System for Finland

Dr Terhi Heinasmaki, Vaccine Safety Officer

Dr Pekka Holmstrom, Consultant

Ms Eeva Pekkanen, Registered Nurse and Research Assistant

#### **Järvenpää Child Health Clinic**

Mrs Kirsti Saarela, Registered Nurse

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## 4. INTRODUCTION

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### 4.1 THE IMPORTANCE OF IMMUNISATION

Immunisation is a core public health function because it benefits not just the individual but the whole society. The definition of public health is the

...process of mobilising local, state, national, and international resources to ensure the conditions in which people can be healthy (Detel, R, et al, 1997).

The aim of all immunisation programs is to reduce the morbidity and mortality associated with vaccine preventable diseases and to control (eg pertussis), to eliminate (eg polio), and to eradicate (eg small pox) these diseases. Effective immunisation programs meet the principal aim through maintenance of high levels of vaccine uptake while at the same time paying attention to the need for quality immunisation service delivery.

Often, health professionals involved in immunisation (vaccine providers), see immunising a person as a merely clinical act of injecting vaccine. Whilst it is true that immunisation is a clinical encounter between a health professional and a client, there is much more than that. When a health professional is immunising someone, he or she is participating in a global and national endeavour that requires a sustained, consistent approach and which is aimed at all the world's population. This vast enterprise is carried out by over 2 million vaccine providers globally.

Vaccination represents the interface between an individual, clinical intervention and a vast public health initiative that is aimed at the global control (and in some cases eradication) of specific vaccine preventable diseases. These diseases include diphtheria, tetanus, pertussis, measles, mumps, rubella, invasive *Haemophilus influenzae* type b disease, hepatitis B and poliomyelitis.

Immunisation is one of the most effective public health interventions or preventative strategies for the control and eradication of communicable diseases in the world. It has been estimated that immunisation currently saves 3 million lives per year, while remaining one of the most cost-effective health interventions. Immunising a child not only protects that child but also other

children, by increasing the general level of immunity and minimising the spread of infection (Freeman et al, 1993).

Society benefits from immunisation through the reduction, elimination or eradication of preventable diseases. For diseases that are transmitted from person to person like measles, the public health goal of immunisation is to reduce the proportion of susceptible individuals in the population to the point where no further transmission of that disease causing organism occurs. Such community-wide protection, called ‘herd immunity’ assures freedom from disease for those to whom the vaccine may not have been administered and for those where the vaccine did not achieve the protective effect. For some diseases a bout of illness stimulates immunity against the same disease in the future. Vaccines mimic this effect of infection but without causing the complications of disease. If nearly 100% of the population were fully immunised those people with no immunity are protected. For the very young, whose immune systems are incompletely formed, and for the very old, whose immune systems are failing, a vaccine may stimulate immunity inadequate for protection. The same risk exists for individuals who have poor immune systems (eg people with cancer or HIV/AIDS). When those who could gain protective immunity from a vaccine remain unvaccinated, they increase the risk to individuals whose only hope of protection is ‘herd immunity’. Unless a disease is eradicated (like smallpox), each new generation of children must be immunised or the risk of outbreaks and epidemics recur. Because of this effect, immunisation is a vital element of public health practice at local, state, national and global levels (Freeman et al, 1993).

## 4.2 IMMUNISATION IN AUSTRALIA

It is only since 1992 that Australian politicians and the public have realised how dangerously low our immunisation coverage really has been. One of the first public embarrassments for the Australian government in relation to immunisation, was the publication of UNICEF’s *Health of Nations Report* in 1993. The report compared vaccination rates across the world and demonstrated that Australia ranked 26th of the 28 OECD nations in terms of the level of childhood immunisation. The *1995 National Health Survey* conducted by the Australian Bureau of Statistics demonstrated that only 63% of Australian children under 6 years of age had completed their immunisation schedule. Note that for many of the vaccine-preventable diseases, 100% of the population need to be fully immunised to control, eliminate or to eradicate the diseases. At the same time public health professionals, continued to pressure the government to act on these appalling statistics and a number of national conferences highlighted the problem during the early 1990s. In 1992, the then Minister of Health, Senator Richardson, decided to increase the level of funding for immunisation. It was due to the Minister and the determination of a few public health professionals that immunisation is at last on the public and political agenda in Australia.

Australia does not compare favourably with other developed nations and indeed rates poorly in comparison with most developing nations in relation to immunisation. This was described in detail in the *Health of Nations Report* in 1993.

Why did this situation occur? We know that the problem is not the anti-immunisation movement, because market research conducted in Australia has consistently demonstrated that 98% of Australian parents support immunisation. It is not because parents are apathetic, and it is certainly not through lack of promotion. In Australia a succession of federal governments since the late 1980s have funded large mass media campaigns to promote immunisation. However, these expensive campaigns have caused only a temporary increases in immunisation rates among children. After the campaigns the rates slide back to around 60% for all vaccines for children under 6 years of age. So what is the problem?

Some of the reasons why Australia has poor immunisation levels have been described in the National Immunisation Strategy in 1993 (NHMRC) and they include:

- A lack of commitment by those responsible in the 3 levels of government;
- Inappropriate and inefficient use of the available resources for immunisation;
- A lack of sustainable, integrated infrastructure to deliver appropriate quality services in the required number of immunisation venues throughout the country; and
- A lack of commitment to actively manage the program at all levels (national, state and local) in a sustainable way. We need key responsible people in place for program management at each level who concentrate on immunisation.

Countries with successful immunisation programs take the management of immunisation service delivery very seriously and build effective and efficient infrastructure. We must build a sustainable immunisation infrastructure and management in Australia that covers service delivery, education of parents and providers, and delivers effective promotional messages—in that order.

### **4.3 THE ESSENTIAL COMPONENTS OF AN EFFECTIVE IMMUNISATION PROGRAM**

During my Churchill Fellowship study tour (May-August 1998) I realised that the experts I met assumed that everyone else knew what an immunisation program was. However, I soon discovered that many of the people I interviewed listed different elements when I asked “What are the essential components of an effective immunisation program?” All countries had common elements in their immunisation programs. However some countries had components that others did not. Countries emphasised the importance of different components.

All national, state or regional programs must essentially solve the same problem. That is, to vaccinate all the eligible population, at the correct time, using safe, effective vaccines, in a safe way. This has to be done until the diseases are controlled (pertussis), eliminated (polio in Australia) or eradicated (smallpox across the world). The problem must be solved in the context of schedule changes, operational issues such as funding mechanisms, the structure of the health care system and of politics. The program must be run in a sustainable and consistent way.

It quickly became clear that different countries solved this problem in different ways, and that the solutions chosen change over time. After my study tour I have developed a list of the essential components of an effective immunisation program. The core components are:

- An effective and appropriate system of service delivery so people can easily access the recommended vaccines;
- A cost-efficient vaccine funding system with outcomes tied to demonstrated achievement of the outcomes;
- A system to measure the performance, quality and outcomes of the program and a process to feed back the performance and outcome data (and other information) to the vaccine providers and program managers in a regular and timely fashion;
- An effective system of education of the community and vaccine providers (undergraduate, and postgraduate);
- The purchase, supply and distribution of safe and effective (potent) vaccines;
- A visible and active system of immunisation program management and coordination. This must operate vertically (between levels of the program: national, state or regional, and local) and horizontally (within the 3 levels: eg between providers at the local level). There must be a process to encourage collaborative relationships between stake-holders throughout the system;

I have organised this report under headings that reflect these essential components of an effective immunisation program. I have expanded on these components in Section 5 using the best-practice models I saw during my Fellowship study tour.

#### **4.4 AIMS OF THE CHURCHILL FELLOWSHIP TO STUDY INTERNATIONAL IMMUNISATION PROGRAMS**

When I applied to the Churchill Trust for funding for my Fellowship, I supported my application with the details on the aims of my study tour. These aims include:

- To study immunisation programs from an international, national, state (regional), and local perspective concentrating on best-practice models of infrastructure development, management and service delivery. To evaluate immunisation service delivery provided by nurses, doctors and non-medical staff including health visitors;
- To evaluate those aspects of New Zealand, Canada, USA, UK and Finnish immunisation programs which may have implications for improving and sustaining vaccination levels, and the quality of immunisation programs in South Australia and Australia.

Specifically to:

- define the essential components of national, state or regional, and local immunisation programs;
- find best-practice models of immunisation coordination and management including the development and implementation of the role of local, regional and national immunisation coordinators. These roles have increasingly been developed to provide the horizontal and vertical linkages within immunisation programs and to improve the integration between public and private immunisation activities;
- evaluate methods of immunisation policy development and implementation including clinical guidelines;
- evaluate best practice models for surveillance of vaccine preventable diseases, vaccine coverage and adverse events following immunisation, and how these are linked to management decision-making and quality service delivery;
- find best-practice models of national, state and local immunisation registers or tracking systems;
- review special or specific immunisation services for high risk and hard-to-reach populations;
- review the issues around effective and cost-efficient methods of national, state and local immunisation service delivery funding;
- review methods of vaccine purchase, distribution and cold-chain management;
- review strategies for sustainable immunisation education for health professionals and the general population;
- review methods of immunisation promotion, marketing and media issues;
- review 'no fault' compensation mechanisms for adverse events following vaccination;
- assess the relationship between anti-immunisation groups and the orthodox health system—how to understand and manage these processes;
- review public health legislation in relation to immunisation including school entry legislation requiring mandatory immunisation record keeping;

- review the mechanisms that link national programs with global immunisation programs including the World Health Organization program (GPV & EPI), and UNICEF programs; and
- improve my understanding of international and national strategies for vaccine-preventable disease elimination and/or eradication (specifically for polio and measles) eradication, including ‘big bang’ or national immunisation days (NIDs) and other initiatives.

In summary, my goal was to discover what other countries have done to achieve high levels of vaccine uptake and high quality service, and which (if any) of these strategies could be used in Australia to move us from around 63% vaccine coverage (ABS 1995) to near 100% vaccine coverage?

#### **4.5 WHY MY PASSION FOR IMMUNISATION?**

My commitment to immunisation was a natural extension of the belief I hold that primary prevention strategies like immunisation can deliver more to human health than individual, clinical health initiatives.

My background is in clinical nursing, Aboriginal health, nursing management, academic nursing, and in immunisation program management, where I have worked for the last 6 years. I have been responsible for leading the state-wide immunisation programs in two Australian states—ACT from 1993 to 1996 and SA since early 1996.

I believe immunisation is one of the fundamental cornerstones of health and is one of the most effective and safe medical technologies invented. However, immunisation services must be delivered with professionalism, respect and a commitment to quality in the long-term. I have a practical view of program management, which I summarise in the phrase: “putting ideas/words/research into action”. During my time as an immunisation program manager, I have observed that in Australia we have been able to describe our problem and what we need to do about it. But we have not been good at putting those recommendations into action.

#### **4.6 BACKGROUND TO THE WINSTON CHURCHILL MEMORIAL TRUST OF AUSTRALIA**

The Winston Churchill Memorial Trust was established in Australia in 1965, the year of Sir Winston Churchill’s death. The stated aim of the Trust is to “perpetuate and honour the memory of Sir Winston Churchill by the award of Memorial Fellowships known as ‘Churchill Fellowships’”. The Fellowships are awarded to provide opportunities, with the understanding that “with opportunity comes responsibility”.

Sir Winston Churchill believed that world peace and greater international understanding could be promoted through ordinary people travelling to other countries and experiencing other cultures.

In his honour, the Australian Winston Churchill Memorial Trust assists Australians to travel overseas to learn more about other people and cultures and to investigate topics that will help them to increase their contribution to the community and their trade, industry, profession, business or calling.

Through the awarding of Churchill Fellowships, the Trust helps all kinds of Australians—community workers, engineers, business people, actors, teachers, nuns, artists—to travel overseas and bring back with them new insights and understanding that will enrich their community and, ultimately, Australia as a whole.

Churchill Fellowships are intended for travel for intensive investigative research. There are no prescribed qualifications, academic or otherwise, for the award of a Churchill Fellowship. Merit is

the primary test, whether based on past achievements or demonstrated ability for future achievement in any walk of life. The value of an applicant's work to the community and the extent to which it will be enhanced by the applicant's overseas study project are important criteria taken into account in selecting a Churchill Fellow. Preference is often given to applicants who have not had overseas experience and/or are not in a position to fund overseas study from their own resources.

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#### **4.7 MECHANISMS TO PROMOTE IMPROVEMENTS IN IMMUNISATION PROGRAMS IN SOUTH AUSTRALIA AND AUSTRALIA**

Since returning from my study tour I have endeavoured to influence the South Australian and Australian (SA) Immunisation Programs in the following ways:

- I have used my experience to ensure sustainable funding for the Local Immunisation Coordinators project within SA;
- I have strengthened the horizontal and vertical links for which I am responsible in the SA Immunisation Program as the state Immunisation Coordinator;
- I have given a number of presentations about the lessons I learned from my study tour;
- I have used many of the resources I gathered to assist me in my role as member of the Australian Technical Advisory Group on Immunisation;
- I plan to continue push for more consistency between states in the approach to immunisation through my membership on the National Immunisation Committee;
- I plan to present a paper on the lessons I learned from the Churchill Fellowship at the next National Immunisation Conference;
- I plan to complete a paper with Dr Roger Bernier (CDC, USA) about the essential components of effective immunisation programs;
- I have been involved more closely with New Zealand colleagues recently through e-mail;
- I have presented a paper about the lessons learned from my Churchill Study tour in April 1999 to the New Zealand National Immunisation Coordinators' Conference;
- I assisted in the report on the recent review of the Local Immunisation Coordinator role in New Zealand and in the national Public Health Association conference;
- I have presented to state and national colleagues;
- Based on my contacts with the people in the UK Health Education Authority in London, I presented two papers in Manchester (UK) at the 1st International Conference on Immunisation and Vaccines in September 1999. The papers discussed best-practice models on immunisation education for health professionals within the context of anti-immunisation activity and best practice cold chain strategies in Australia;

- I will be distributing copies to this report to relevant people in Australia and overseas to provide feedback from the interviews I conducted during my Churchill Fellowship study tour.

#### 4.8 REPORT LIMITATIONS

It is impossible to do justice to all the information I collected from all the people I interviewed during the 3 months of my 1998 Fellowship. I collected over 16 hours of interview material. I made written notes during the 100 or more interviews I conducted. I then taped this information (using a dictaphone) and had the information transcribed for report writing. In addition to the taped interview material, I sent home over 4 boxes of reports, videos, books and other material which supported the interviews. I used over 30 rolls of print film to record the highlights of the trip.

This reports summarises what I consider to be the most important of the material. I have necessarily omitted a large amount of material in order to keep this to a reasonable length. I have only described those best-practice models that are most appropriate for use in Australia or South Australia. The material is naturally biased because I did not visit all immunisation programs in all countries. Neither have I described all the events and knowledge gained in every country I did visit (for example Canada, Switzerland and Finland). This is because much of the material from those countries reinforced what I had already learned, or because the models were so different that the knowledge gained could not be adapted for Australian conditions.

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## 5. ESSENTIAL COMPONENTS OF AN IMMUNISATION PROGRAM AND EXAMPLES OF INTERNATIONAL BEST-PRACTICE MODELS

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One of the most important outcomes from my Churchill Fellowship study tour was the confirmation of a view I have held for 10 years about immunisation program management. That is, in order to meet the challenge of achieving and then sustaining high levels of vaccination, and then ensuring the services are delivered in a high quality manner, there must be a commitment to actively build and actively manage the infrastructure to support the immunisation program. This must be done at a national, state and local level. This requires strong leadership and a commitment to build an integrated system. This might seem obvious to an outsider, but in Australia I believe we (those responsible in government and in professional groups) have been unable to clearly enunciate and then agree on what needs to be done. We have been slow to commit resources to a sustainable consistent program.

Before we commit to building and managing sustainable immunisation program infrastructure, we need to agree on the essential components of the immunisation program or system. Before my Fellowship I believed I knew what most of these components were. The Fellowship enabled me to discuss those essential elements with international experts and challenge my ideas. Developing immunisation program infrastructure means more that concentrating on the clinical interface where the vaccine is administered.

In Australia immunisation service delivery and program management is fragmented. This is due to the structure of our health care system and no one person or organisation can be identified with key responsibility for the program at every level of the system.

Infrastructure to support immunisation programs must be in place at the national, regional or state, and local levels. The system must then be linked and managed in some way. Immunisation

program infrastructure includes all those components that lead to sustainable high vaccine uptake through quality service delivery. The components include (as stated earlier) are:

- An effective, sustainable, high quality, immunisation service delivery system that meets the needs of the population;
- A system to educate the vaccine providers and then keep them up-to-date with clinical guidelines;
- A consistent, evidence-based approach to community education with strong links to the rest of the immunisation system. Community education must be sustainable and requires regular assessment of community attitudes and knowledge about immunisation in general and specific issues as they arise;
- Quality management strategies to monitor the immunisation program (a national control authority for licensing new vaccines, vaccine research and development, adverse events surveillance, cold chain maintenance and monitoring, applied research etc);
- A system to measure the outcomes (rates of disease) and performance (vaccine coverage) of the immunisation program and a timely system to feedback that information to those who need it (program managers and vaccine providers);
- A system to purchase, supply and distribute safe and effective (potent) vaccines (this includes quality management strategies); and
- Management and coordination to link all the components into a system that should also include strong leadership at the national, state and local levels.

I have organised this report under headings that reflect these essential components of an effective immunisation program. I have expanded on each of these components using the best-practice models I saw during my Fellowship study tour. I have not described every country's approach to the issue discussed under each of the headings below but have only included those models I thought may be adapted for Australia or South Australia.

## **5.1 EFFECTIVE SERVICE DELIVERY SYSTEMS**

To ensure all the target population can access the recommended vaccines in a sustainable way, an immunisation program manager needs to map the current immunisation system and identify the service delivery gaps. The next step is to build or enhance the service delivery system to meet the needs of the particular population. The program manager should map the current immunisation service delivery environment by using available data on the demographic and socioeconomic features of the population, the location and times of operation of service delivery sites, vaccination coverage, and disease incidence. During the mapping exercise, the program manager must continually be asking, "what are the barriers to high vaccine levels? What are the gaps? What needs to be done?" The result of this mapping exercise should be a plan to build service delivery infrastructure that fills the gaps identified. New or existing resources must be redirected to build the system of service delivery and program infrastructure.

All the countries I visited could articulate a clear management plan for their immunisation programs which were based on current information. In this way they knew the context in which their program operated and could describe the gaps in the program that needed to be addressed to ensure high vaccine uptake and a quality program. This needs assessment is of course an essential planning tool for any effective program manager. In addition, the needs analysis should be continued regularly to ensure that the immunisation program is both relevant and effective. The service must fit the needs of the people it serves.

Professor Walt Orenstein (CDC) states there are three main barriers to immunisation:

- parental attitudes and knowledge about immunisation
- the attitude of vaccine-providers and
- access to service providers.

However Professor Orenstein also notes that having access to a vaccine service-provider and using the service, are not the same (personal communication, Atlanta, June 1998).

Private sector service delivery systems are no better or worse than public sector service delivery according to Professor Orenstein. The challenge is to integrate private and public sector service delivery systems and make them relevant to the population. Links can also be made between the public and private sector to access resources or mobilise public support for the immunisation program. Examples of this include the support by Rotary and other private service clubs who provide health promotion resources for local programs in Maryland USA or the Regional Outreach Coordinators' role to mobilise parental support for immunisation as a strategy to offset the effects of anti-immunisation groups. I discuss these strategies later in this report.

Both public and private sectors face the same challenge to improve vaccine uptake. The use of national, state or local methods for assessing vaccine coverage and improving timeliness is another important component of an effective immunisation program. The AFIX system (a local or surgery-based strategy to assess coverage is discussed later in this report) is one method used in the USA.

Services must be accessible and relevant to people who use them. The service provider should be responsible and accountable to ensure that all the children (and adults) in his or her population are fully immunised. Service delivery must match needs of the population. One of the best examples of appropriate service delivery match to the needs of the population was the work of Judith Morton among Oxfordshire Travellers.

Immunisation service delivery systems in the countries I visited were the products of the political, economic and cultural history of those countries. This is also true of Australia. Despite the differences in the structure of their health-care systems in these countries, I found there were lessons to be learned from most countries, as those responsible for immunisation grappled with the question of how to effectively vaccinate all the population with all the recommended vaccines and how to vaccinate at the time recommended.

### *5.1.1 Main stream immunisation service delivery systems*

#### **(a) New Zealand immunisation service delivery and Plunket**

In NZ, general practitioners are funded to vaccinate children aged 0-6 years of age while public health nurses vaccinate the school age population. This is similar to the Australian situation. General practitioners are also given supplementary funding for practice nurses, who usually vaccinate the children. This does not occur in Australia. This system appears to work well in NZ, although they cannot currently adequately measure immunisation rates in their country.

Public health nurses provide many of the school-based immunisation services. There is effort put into obtaining written consent and to following-up students who are not vaccinated on the day the nurses are at the school. Teams of nurses who are employed by a central health organisation visit schools over a wide area and this tends to be an effective way to ensure the nurses are kept up to date with immunisation practices. Health visitors follow-up overdue children and, in some cases, work closely with general practitioners in their areas to ensure children are immunised on time. The extra effort has resulted in high vaccine coverage in school programs. In the Hutt Valley area of Wellington, the average coverage for adult diphtheria, tetanus (ADT) and measles, mumps

rubella (MMR) vaccinations is between 87-95%. Only 2.5% of parents in this area do not consent to immunisation and 5-7% of parents prefer the vaccines to be administered by their family doctor. The ADT and MMR programs are often implemented concurrently which means that most school children receive two injections on the same day. This means they are providing a more cost-effective service by removing one visit from the adolescent schedule. We have not done this in Australia probably because of the resistance from doctors and nurses to administering 2 vaccines on the same day.

Well mother and baby services are provided by an organisation called the Plunket Society. This is a national network of maternal and child health nurses who work in 130 well child health centres and 30 family centres. They offer lactation consultation and other maternal support services. These nurses are in a good position to offer opportunistic immunisation but on the whole, Plunket nurses do not routinely immunise. Plunket produce the NZ parent held child-health record similar to the Australian 'blue book' or parent held record (PHR). Plunket have been funded for a pilot program that targets high risk Maori and Pacific Islander children using an outreach immunisation bus. However, this service seemed inefficient because the nurses do not have complete immunisation tracking systems to follow-up children and must rely on parents coming to the bus rather than the nurse visiting homes of long-term overdue children and offering 'on the spot' vaccination at home. It would seem to be the answer to the problem of vaccinating the NZ 'casual' childhood population.

This model, if used by maternal and child health nurses in Australia, could provide the answer to following up overdue children using lists from the Australian Childhood Immunisation Register. Like many of the Australian maternal and child health nurses, Plunket nurses seemed reluctant to immunise or were de-funded and were unable to provide this important niche vaccination market. As in Australia, the public well-child check has been de-funded, providing less opportunity for the provision of 'catch-up' services for immunisation by these types of organisations.

#### **(b) Immunisation service delivery by general practitioners in the UK**

When a child is born in the UK, the parent nominates who their doctor will be from a list of doctors available within the National Health Service (NHS) Trust area. The birth is notified by the hospital to the relevant NHS Trust and the information is added to the child health data base. The Trust then sends a list of children due or overdue for vaccination, to the appropriate general practitioner surgeries in the Trust area, to the parents (using a postcard) and to the district Health Visitor. When a child moves to another area the parents must nominate another doctor and their data are transferred to their nearest NHS Trust so the vaccinations and other well-health checks can be monitored and followed-up.

Doctors are sent lists of appointments for immunisation for their population of allocated children by the NHS Trust. These appointment lists are often put together on specifications provided by the doctors. These specifications may include preferred days and times for regular vaccination sessions. The district Health Visitor is also sends a similar list for all the children in their district with the name and addresses of all the nominated doctors. Part of the Health Visitor role is to follow-up children to ensure they get their vaccinations on time. They often visit parents antenatally and by UK law, they must visit the child at home 10-14 days after birth. At this time the Health Visitor may discuss immunisation and remind parents of the date the first vaccination is due and how to get to the surgery. Information may be provided to assist parents with informed consent for the vaccination at this time.

Once the doctor has completed the vaccinations, the up-dated list of vaccinated children is returned to the NHS Trust so the Trust can keep the child's records current. Vaccination data are sent regularly to the Communicable Disease Surveillance Centre in London. It is here that the national

vaccination levels are collated and published. So the data are used to feed back information to the service providers and program managers and national authorities. This system ensures timely vaccination occurs throughout UK and supports the national system of accountability and monitoring of the immunisation programs outcomes.

This is a best-practice model of an actively managed immunisation program at local, regional and national levels. It also demonstrates the importance of feedback of information for action and monitoring outcomes. Although Australia does not have a National Health Service, the model of timely use of vaccination data by the relevant people to ensure high vaccine coverage is of use in Australia. We already have some of this infrastructure through the Australian Childhood Immunisation Register and feedback is provided regularly to doctors, but more needs to be done to ensure public sector vaccine providers are integrated into the feedback system. Maternal and child health services should also be used more to target overdue children, with the aim of either vaccinating them at home or getting them to the parent's nominated service provider.

#### 5.1.2 *Effective service delivery systems for high risk populations (Oxford and the Travellers)*

I saw many examples of special programs built to meet the needs of a specific target populations who have problems accessing vaccination from the mainstream service providers. However the work done in Oxford with 'Travellers' by the district immunisation coordinator was the most useful in terms of lessons to be learned for Australia.

##### **(b) UK and the match between vaccine providers and the target population. Ways to get appropriate services to the "high risk" groups. The Oxfordshire model for Travellers.**

'Travellers' is the appropriate term used for a cultural group who live mainly throughout Europe and who are often known as 'gipsies' or 'tinkers'. These latter terms are pejorative and are not acceptable to the people involved.

Judith Morton is the district Immunisation Coordinator who has worked with Travellers in the Oxfordshire area for the past twelve years. Immunisation is one of the many parts of Judith's work but the Travellers know and trust her and it was evident that many of the people would travel specifically to Oxford from many parts of the UK in order to obtain health care from Judith.

Judith understands and is sensitive to, the cultural norms of the Travellers and I was reminded of the similarities between them and Australian Aboriginal people. Both peoples are highly marginalised and suffer racial prejudice and institutional discrimination. In both cases their health indicators are much poorer than the rest of the population. Main-stream health services are not acceptable to both groups and both groups are itinerant and highly mobile.

Travellers are a culturally separate group to the Anglo-Celtic culture by way of their chosen way of life, their beliefs, values and norms, their social structure and the way they arrange their social and economic life. They travel and live in mobile homes but shun caravan parks and use common or unoccupied land, or park illegally. This is because they inherently distrust main-stream English life, rules and have a general mistrust of authority. This mistrust is reflected by the English main-stream. Local Councils often plough up road verges to keep Travellers from unauthorised use of unoccupied land.

Travellers have strict social norms, are very socially conservative and very status conscious. Not all Travellers are poor and there are social divisions based on wealth. I saw Travelling families living in luxurious mobile homes pulled by Mercedes-Benz cars but other vans were very dilapidated. Some Travellers are highly educated and others are illiterate. Some travel continuously and some only travel from time to time and live semi-permanently in a particular place. Most families have large numbers of children. It is a very patriarchal society and women

and men seem to live separate lives during the day. Clan or family loyalty is a strong feature of their culture.

Judith takes her services to the Travellers, including the immunisation program. She knows where families are and can track the children for vaccination relatively easily. A lot of her work is catch-up since many families do not attend any health service provider apart from her. The family members I spoke to said they seek Judith out and trust her advice on any health or social security matter because she ‘cares’ and ‘understands’ them. Judith relies heavily on the regional child health register at the Oxfordshire NHS Trust to keep the vaccination records of the Travellers up to date.

Although the service she provides is probably more expensive it does appear to work, simply because the service is based on the Travellers’ needs rather than the needs of the health service. Her program of vaccination is a bridge to other health and welfare services for these families. In many cases, Judith is the only health service provider who deals comprehensively with the families. She has found specific doctors who will treat Travellers and who are acceptable to them. If she refers these people to these doctors, the people usually attend. Judith says that most of the Travelling families she works with are fully immunised which is fairly unusual for Travellers in other parts of the UK.

We have done much to build health services for Aboriginal people in Australia. However we are still not good at providing appropriate health services to this population by mainstream service providers.

## **5.2 COST-EFFICIENT VACCINE AND SERVICE-DELIVERY FUNDING SYSTEM**

A cost-efficient vaccine funding system is an essential part of any immunisation program. This component also includes a system of funding tied to performance (immunisation levels) and outcomes (disease rates). In this way tax-payers’ money is spend effectively and a system of accountability can be sustained. The best models I saw during the Fellowship study tour include a system for purchasing vaccines on the basis of nationally negotiated prices. This means vaccine prices were kept as low as possible while encouraging competition in the market place. It also allowed for less complexity among the vaccine brands purchased. Countries with a limited number of available brands had the same high level of immunisation as countries where multiple brands were purchase and distributed. Vaccines should be free to the population and, if possible, service delivery should not be charged for. However countries with high immunisation levels used different systems. The UK has limited brands available and vaccines and service delivery is free. On the other hand, the USA has multiple brands available and only have free vaccines and services for the poorest of the population.

### *5.2.1 New Zealand*

New Zealand operates a mixed health economy. The NZ Government purchases immunisation services for children under age of 6 from general practitioners while most of the school based programs are purchased from public sector health services. The government funds general practice for immunisation with a separate fee-for-service (health benefit) of NZ\$11 per occasion of immunisation service for 5 visits for a child under 6 years of age. The general practices are also provided funding for part of the salary of their practices nurses who are responsible for a wide range of primary care activity including women’s health, immunisation, diabetes monitoring, and counselling. The practice nurse is trained and supported in a wider nurse practitioner role and this frees up doctors to treat more difficult cases. This seems to be a more cost-efficient and effective model than the Australian situation.

In addition the Independent Practitioners Associations (IPAs) (similar to Australian Divisions of General Practice) are funded to employ immunisation coordinators. These networks or associations are not geographically based but are groups of doctors who volunteer to join together and bid for general practice service delivery funding from the government through the Health Funding Authority. A group of doctors within one IPA may be scattered across different geographic areas.

The NZ government has been moving towards capitation funding (based on the UK model) and more and more patients have to register with a particular doctor who is then funded for the population he/she cares for. Individual doctors are given a lump sum payment for the primary health care of their registered patients and the doctor cannot bulk bill the government for individual occasions of services. However the drawback of capitation for immunisation is the problems associated with practices who may carry large numbers of 'casuals' (patients who move from doctor to doctor or region to region). Without a central vaccine tracking register, it is difficult to follow-up overdue children who are also casuals and almost impossible to measure vaccine coverage. Casual children also are more likely to belong to high risk populations.

In terms of vaccine purchase, the Institute of Environmental Science and Research Ltd (ESR) is responsible for purchasing vaccines for NZ. This is done through a national tendering process every 2 years. ESR request vaccine manufacturer to register their vaccines. NZ pays very low prices for their vaccines in comparison to Australia. Most vaccines only cost NZ around NZ\$1.00 or less. The highest priced vaccine was a DTPw-Hib combination which was under NZ\$10. The low prices are possibly due to the different requirements NZ has for vaccine approval.

NZ has demonstrated that, despite the barriers in a mixed health economy, a system can be built to fund vaccine service delivery that increases access to immunisation. However, they fund some aspects of immunisation infrastructure nationally in way that Australia has not attempted. The funding of practice nurses and District Immunisation Coordinators based in the IPAs is a model that can (and has been) adopted in Australia. SA has had Local Immunisation Coordinators based in our Divisions of General Practice since mid-1998.

### 5.2.2 *USA, a model where funding is tied to demonstrated performance and outcomes*

In USA I saw an example of how effective federal funding agreements with the states is based on performance and outcome reporting, to ensure children do get fully immunised and are given high quality immunisation services.

I interviewed Mr Dennis O'Mara at the Centers for Disease Control and Prevention (CDC) in Atlanta. He is in charge of grant arrangements between the Federal Government and the States in relation to immunisation. I also interviewed Dr Peter van Dyck, Director of the Office of State and Community Health in the US Department of health and Human Services in Washington DC about funding mechanisms and accountability. In addition, I discussed funding and reporting mechanisms to support the National Immunisation Program (NIP) with Professor Walter Orenstein who is the Director of the NIP in CDC .

The US Federal government, through the NIP provides a block grant to CDC for NIP internal operations. More importantly, it provides a block grant to the CDC for each state for some vaccines and for some aspects of service delivery. The NIP then passes these funds on to the states. There are two parts of the immunisation grant through NIP to the states. One is for the purchase of vaccines and the other for operational and service provision activity. This is unlike Australia, where almost no money is provided to the states from the Commonwealth for operations and infrastructure development. The US NIP funds immunisation program managers within public health units of each of the states, and these people can articulate easily with CDC. The states in

turn, provide grants to the county health authorities who actually provide some public immunisation services as well as implement CDC policy and collect data on vaccine levels and disease rates.

The federal immunisation grants via NIP require the states to establish measurable goals that can be reported as part of the yearly budgetary process, thus linking funding decisions with performance. The grants are intended to

improve Federal program effectiveness and public accountability by promoting a new focus on results, service quality, and customer satisfaction (Health Resources and Services Administration, US Department of Health and Human Services, Maternal and Child Health Services: Title V Block Grant Program, Guidance and Forms for the Title V Application/Annual Report, December 1997, page 1).

Each Federal agency in the USA is required to develop comprehensive strategic plans, annual performance plans with measurable goals and objectives, and annual reports on actual performance compared to performance goals. These are called Immunisation Action Plans.

The Federal Government provides funding both for vaccines and service delivery aspects of the program through the block grants. In return, states must commit themselves to the development of the Immunisation Action Plans and more importantly they must demonstrate that they have put the plan into action and that those actions achieved the goals and targets set. I brought back a copy of one of these Plans from Baltimore, Maryland.

Medicaid also provides vaccines for high risk population and service providers are reimbursed for providing vaccinations to high risk populations. Not all vaccines are free to all the population. The Funding Agreement document is attached to the state Immunisation Action Plan and details of targets for vaccine coverage and quality issues (education etc) are listed. Most Immunisation Action Plans have set a target of 90% vaccine uptake by the 2000 for all children prior to school entry.

States are funded only if they can prove they have achieved what they promise in the Immunisation Action Plans. In other words, they must demonstrate performance.

The Action Plans must define immunisation core business (ie. list the essential components of their immunisation program). At the beginning of the calendar year, the Action Plans and the budgets are drawn up in collaboration with stake-holders within each state and between the state and the Federal government through NIP (CDC). Most of the Chiefs of the Health Departments within the States and the relevant people within CDC are involved in developing the Funding Agreements. The Action Plans are usually developed by the state Immunisation Program Managers and epidemiologists.

At the end of each reporting year the state person responsible for immunisation program management is interviewed in Washington by the Federal Government grant manager. In this interview the state must demonstrate it has been accountable for the grant for immunisation and has implemented the agreed Immunisation Action Plan. The state submits a comprehensive report to account for the immunisation program grant and the interview provides a process for the state to present their reports to the Federal Government.

At this meeting the state program manager must defend his/hers performance or report. They must show how they used their money and prove they implemented their Immunisation Action Plan. One of the biggest problems is how to consistently measure vaccine coverage across the USA so that the states' performance can be compared to the agreed vaccine coverage target. Criteria for accountability include:

- Coverage for specific vaccines and for specific age groups;

- Rates of vaccine preventable diseases in the state;
- Education strategies to target the population and high risk groups; and
- Infrastructure development to support quality services.

This is the process in which the US\$4 billion which are used to fund immunisation in the USA is accounted for by the states. If a state cannot demonstrate action, their federal funding for future years is threatened.

At the moment the NIP is trying to establish what makes up the core business or essential components of the immunisation program to ensure appropriate priorities are set under the grant arrangements.

One of the issues raised in my interviews about funding for service delivery in the USA was made by Professor Walter Orenstein, that provision of adequate services and access to service delivery are not the same. In other words, a state may set up 'appropriate' infrastructure for vaccine service delivery but this does not mean that parents will use the services. Professor Orenstein felt that service providers assume that parent know that their children are immunised or not. However, many parent believe (incorrectly) that their children are up-to-date and so do not use the services for this reason. Even when parents are told their child needs a catch-up they may not believe this and ignore the message. For this reason a national vaccination register (or state vaccination register) to track vaccine histories for all children and which can manage recall and reminder systems is an essential component of an effective program. Australia is indeed very lucky to have such a system. USA has no national vaccine register but many states are implementing state registers.

Unlike Australia, the US government carries out the agreements with the states to the letter. States are made accountable for losing tax-payers' money and if they do not perform the federal government cuts back their funding. We need to take accountability more seriously in Australia and I believe the federal government should provide extra funding to those states that perform better. At the moment in Australia it seems that those states that perform better are treated exactly the same way as states that are performing in a sub-optimal way. This system of funding to the lowest common denominator is out of step with international models of funding for immunisation. As a consequence, many states continue to gain Commonwealth funding even though they have only ever committed limited resources to immunisation.



PHOTO: Self with Mrs Elvie Munday on the steps of Churchill House in Canberra a few months prior to my departure on the Churchill Fellowship study tour.



PHOTO LEFT: Ms Alison Leadley, Immunisation Coordinator for Primary Health Care Services, New Zealand, May 1998

**Immunisation services should meet the needs of the population.**

PHOTO BELOW: Plunket maternal and child health nurses vaccinating Pacific Island children from their immunisation bus in Auckland, May 1998.

PHOTO BOTTOM: Mrs Kirsti Saarela, Immunisation Nurse for Järvenpää, Helsinki. Vaccination as part of well-child care in Finland, July 1998.



**Innovative promotion strategies and mobilising support for immunisation in the private sector.**



PHOTO ABOVE: Mrs Sandra Cox (far left), self and the rest of the immunisation team at Montgomery County Immunisation Unit, Silver Springs, Maryland, USA, June 1998.

**Surveillance of adverse events following immunisation to monitor vaccine safety.**



PHOTO ABOVE - left to right: Dr Robert (Bob) Chen (Chief, Vaccine Safety and Development Activity, CDC, with self and Ellen Chen (taken in Adelaide, November 1998)



PHOTO ABOVE: Taking immunisation services to Travellers in Oxfordshire.  
Ms Judith Morton, District Immunisation Coordinator, Oxford. July 1998.

**Surveillance of vaccination coverage and feedback is  
an essential component of the UK immunisation program.**



PHOTO ABOVE: Mrs Marie Rush, Nurse Epidemiologist and  
Manager of COVER at CDSC in Colindale, London, UK. June 1998.

**Disseminating knowledge and experiences gained from the Churchill Fellowship is a responsibility of Churchill Fellows.**



PHOTO ABOVE: Presenting at the National Immunisation Coordinators' Conference, Christchurch, New Zealand, April 1999.



PHOTO BELOW: Working with Local Immunisation Coordinators, Adelaide, South Australia, March 1999

### 5.3 A SYSTEM TO MEASURE PERFORMANCE, QUALITY AND OUTCOMES AND FEEDBACK OF DATA AND OTHER INFORMATION TO IMMUNISATION PROVIDERS AND MANAGERS

An essential component of any effective immunisation program is a system to measure performance (vaccine coverage), quality (eg adverse events surveillance, cold chain surveillance, clinical practices etc) and outcomes (rates of vaccine preventable diseases). Funding should always be tied to demonstrated performance (vaccination levels) and outcome data (reduction of disease) and there should be regular evaluation of the quality aspects of the program. Targets should be set so results can be compared to them and funding should follow which reflects levels of achievement. In this way program managers and vaccine providers can be made accountable. Funding organisations should take these aspects of the program seriously. These strategies to measure performance, quality and outcomes of the program should be implemented at all levels of the system. This aspect of effective program management was confirmed by my experiences overseas. I have dealt with the funding accountability aspects in section 5.2.

Part of the system should include strategies to provide feedback of the information to vaccine service providers and program managers. In order to ensure continuous improvements in vaccine uptake and the quality of the program, the performance and outcomes of any immunisation program should be available so they can be used in a timely manner at the national, state and local levels. This includes data collected from vaccine registers, from monitoring systems (coverage or disease rates), and other scientific information that must be readily available to support the clinical and technical aspects of the program. This means that providers are then able to deliver vaccines in a consistent, appropriate and up-to-date way to ensure high quality services are available to the population.

#### 5.3.1 *Disease surveillance*

If the immunisation program is effective then the rates of the target vaccine-preventable diseases should drop or cease completely. In this report I am concentrating on diphtheria, tetanus, pertussis, invasive *Haemophilus influenzae* type b (Hib) disease, poliomyelitis, measles, mumps, rubella and hepatitis B.

The data on these vaccine preventable diseases must be collected, collated, analysed, meaningful interpreted and fed-back to program managers and vaccine providers in a timely manner. The point must be made to all those involved in immunisation that the aim of any immunisation program is to reduce the morbidity and mortality associated with vaccine-preventable diseases and to control (eg pertussis), to eliminate (eg polio) and hopefully to eradicate (eg smallpox) these diseases. I believe the UK and USA do this really well. In addition they also have effective systems of enhanced surveillance of vaccine field efficacy (level of protection afforded by vaccines once they are used in the field). This is especially for measles, rubella, Hib and pertussis.

I have already described the accountability systems based on outcomes used in the USA through stated targets set down in the state Immunisation Action Plans. The CDC funds each state to employ an epidemiologist to assist with disease surveillance while at the same time resources are available within CDC itself to review and respond to the national data on disease rates. CDC can assist with disease control if there are severe outbreaks of measles or pertussis for example. Immunisation interventions are planned on the basis of the epidemiology of vaccine preventable diseases at the state and national level.

A similar system works effectively between UK regional Public Health Laboratories (PHLs) and the Communicable Disease Surveillance Centre at the central PHLS in London. Data are

published nationally on a regular basis and immunisation interventions are planned on the basis on these data at the national and regional levels.

While Australia has state and national capacity for disease surveillance, the system is not consistent throughout the country and many program managers still do not take seriously the need to measure their immunisation programs' successes (or failures) on the basis of these data. Regional and local immunisation initiatives are not necessarily implemented on the basis of the current epidemiology of vaccine-preventable diseases. However, this information is an important factor used when the Australian Standard Vaccination Schedule is considered by the Australian Technical Advisory Group on Immunisation. In addition the funders in Australia do not seriously tie funding to the stated outcomes of the program. Funding is not withheld if targets are not reached by states.

### 5.3.2 *Vaccine coverage*

The performance measure for all immunisation programs is vaccine coverage (vaccination levels in the target population). Vaccine coverage can be collected and reported by postcode, region, country, age or type of vaccine. The results of coverage surveillance should be interpreted and fed back to vaccine-providers and program managers in timely way, for example, at least quarterly. If possible, areas or populations with low immunisation rates should be highlighted for action. Program managers should implement intensive immunisation campaigns in areas of low coverage and the coverage data must be able to produce lists of due and overdue children. There should be a system to ensure a vaccine provider or health service, is made responsible to immunise all overdue people (provided valid consent is obtained).

Parents must have access to individual immunisation records and there should be a strong emphasis on the need for parent-held records. School entry legislation or administrative requirements to encourage parents to produce immunisation records for entry into child care or school is another incentive to encourage parents to keep records. National or state vaccine registers (computerised immunisation records for all the population) are a huge bonus. Australia has the best national vaccine register I saw and we are a world leader in this aspect of immunisation program infrastructure development.

I will not be describing this system in this report but if the reader wishes to obtain information about the Australian Childhood Immunisation Register the contact address is:

Australian Childhood Immunisation Register  
Health Insurance Commission  
PO Box 1001 TUGGERANONG ACT 2901 AUSTRALIA

Website: <http://www.hic.gov.au> (look in the menu for references to immunisation).

The best regional system of vaccine coverage surveillance was the COVER system based on the child health data-bases which is used across the UK. The best surgery or clinic-based surveillance of coverage and feedback, was the AFIX system which uses the CASA database. This system was developed by CDC and is now being piloted in parts of the USA. The recognition of the importance of practice-based computerisation was a feature of the NZ immunisation program.

#### **(a) New Zealand: computerisation in general practice**

New Zealand lacks a consistent and effective way of tracking vaccination of the whole population so that they cannot effectively measure immunisation coverage or follow-up overdue children. Because there is no central vaccine register, the Environmental Science Research Institute (ESR) calculates vaccine coverage using data collected from the immunisation benefit claim forms sent by general practitioners to the Health Benefits Ltd (equivalent to the Australian Medicare).

However, this method of coverage estimation has severe numerator and denominator problems leading to (according to some people I spoke to) gross over-estimation of NZ vaccine coverage. Most of those in responsible positions in NZ felt that surveillance of diseases or vaccine coverage is only useful if the information gathered is used in a meaningful way to manage communicable diseases, especially for vaccine-preventable diseases. Everyone I spoke to felt that an effective method to track vaccinations and measure coverage was one of the highest priorities for the NZ Immunisation Program. However, at the time of writing, NZ still has not solved this problem.

One of the impressive aspects of general practice in NZ was the level of computerisation. Between 80% and 90% of general practices in the North Island were computerised and an estimated 99% of practices had recall/reminder vaccine registers in the North Island. The numbers are lower for the South Island. The problem is that the registers are not integrated so there is no way to get an overall view of coverage or follow-up children who move from doctor to doctor. In Australia the federal government is investing heavily in general practice to encourage greater computerisation and all doctors should be computerised as this would assist greatly with effectiveness of our Australian Childhood Immunisation Register (ACIR). The wide-spread use of paper-based data forms used by vaccine-providers to lodge immunisation data with the ACIR is inefficient and costly.

**(b) United Kingdom: a regional (or state) approach to tracking vaccinations and assessing coverage**

The UK method of calculating vaccination coverage for the country is based on the system called COVER, or Coverage of Vaccinations Evaluated Rapidly. The strategy used to collect the data and feedback to local vaccine providers was explained in section 5.1.1 (b). While COVER operates at the national level, the data are collected and collated at the regional level through the child-health data-bases by the NHS Trusts. The data are then sent to the Communicable Disease Surveillance Centre at the Public Health Laboratory Service in London. These data from all over UK are then analysed through COVER and published quarterly. This system relies heavily on the fact that all health districts are fully computerised. Coverage data are calculated for children at 1, 2 and 4 years of age. Coverage for each vaccine and for each health district is calculated. Once the data are collated and analysed the results are fed back to health districts and other stake-holders including Health Visitors and the Regional Immunisation Coordinators. The coverage data for UK are published regularly in the *Communicable Disease Report*. COVER operates at the regional level and bonus payments are made to general practice surgeries on the bases of their reaching targets. Apart from the Australian system, I think this was the best integrated system for measuring vaccine coverage and planning immunisation initiatives that I saw during my study tour.

**(c) USA: A model of assessing vaccine coverage at the local level using a clinic-based approach**

Staff within the National Immunisation Program (NIP) at the Centers for Disease Control and Prevention have developed a system called AFIX (Assessment, Feedback, Incentives and eXchange of information) using the purpose-built CASA data base. This is a clinic or surgery-based vaccine coverage assessment tool that can be used with or without computers. The aim of AFIX is to ensure children get immunised on time and it provides feedback on-the-spot to the vaccine providers, on their level of immunisation performance. It is understood in most parts of the USA immunisation system, that feedback to vaccine provider about both disease rates and vaccination level are absolutely vital to ensure an effective immunisation program is sustained. State Immunisation Coordinators are responsible to ensure coverage is assessed and feedback is given to the relevant vaccine providers. AFIX helps to diagnose the reasons for low vaccination levels within a particular local clinic or surgery and it is a mechanism to provide feedback on

strategies a vaccine provider might use to improve vaccine uptake. This is done by an 'audit' of clinic or patient records and an assessment of a number of criteria that underpins a quality immunisation program.

In USA, there are no financial incentives attached to achievement of vaccine coverage targets at the provider level. The assessment of coverage is implemented at clinic or surgery level and staff at the surgery or individual practice can assess their own vaccine coverage using the AFIX and CASA tools.

AFIX is a motivational clinic tool and CASA is the software used to assess vaccine coverage in a clinic or surgery. The system is usually introduced by the local or regional immunisation coordinator in clinics in their area. The message is seen as important as the messenger.

Diplomacy is vital when feedback is given on coverage, particularly when coverage was low in a particular clinic. People involved with NIP saw that it was important to use AFIX first in the districts or regions that were already doing well so the vaccine provider can receive positive feedback on their program. The system is designed to link with the state-based vaccine registers (where they exist in USA).

The CASA software is the tool that is used to assist with a rigorous audit of clinic immunisation records and it is a simple, practical and cheap method. CASA evaluates and then provides a diagnosis of the immunisation problem within the clinic or surgery. It is the assessment tool of the AFIX process. I will now expand a little more on each step of the AFIX process.

#### **A = Assessment**

Either the staff of the surgery or the district immunisation coordinator can carry out AFIX. Assessment commences with the selection of a random sample of all clinic records and specific data are entered into the CASA computer software. The software summarises the results of the data collection step. CASA collates the following information:

- timeliness of vaccinations given to the sample chosen;
- whether to child or person started their vaccination schedule on time and whether they completed all the recommended doses on time. This information is given a value;
- whether the clinic uses a recall system;
- how many children from the clinic have dropped out of immunisation completely;
- what contraindication advice was given (coded as correct or incorrect);
- whether or not the clinic provide opportunistic (on the spot) immunisation services;
- were the immunisation services integrated with the well child program;
- does the clinic ensure adequate documentation of the vaccination.

A rating is given for each assessment step. The assessment can be conducted manually if the CASA software is not available. The manual system is a paper-based version of the software.

#### **F = Feedback of results**

After assessment is completed, the CASA software provides a print-out of the results of the clinic's diagnosis in terms of the status of immunisation service delivery and the vaccine coverage. The clinic is given a rating on a scale of 1-10. The immunisation coordinator or practice staff can then work together to find a set of strategies that would help to improve vaccine uptake and the quality of services. The computer runs an automatic program and prints out this diagnostic report. CASA compares the clinic's results against a pre-determined goal that the vaccine-provider can set themselves. This ensures the whole initiative is non-threatening. Feedback is aimed at changing

the vaccine-providers service delivery behaviour and is often met with resistance. The data are presented as a challenge and are given in confidence.

### **I = Incentives and X = eXchange of information**

Financial incentives for surgery-based performance are not a feature of the USA system as they are in UK and Australia. The AFIX system concentrates on intrinsic motivation to improve services and to achieve goals, the recognition of accomplishments towards the vaccine coverage targets set to enhance pride in workmanship, to reinforce the sense of organisation mission and establish priorities from the highest people in the program. This is the 'normative approach' to incentives. Friendly competition with other surgeries or against the regional rate of vaccine coverage provides some of this normative incentive to improve coverage and quality of service.

The final part of the AFIX process is exchange of information or feedback or results. The outcomes of the assessment is provided to doctors and other surgery staff and these results are compared with the outcome of assessment of other clinics nearby (usually in a way so that the other clinic is not identified by name). It is this that acts as an incentive for the provider to improve their immunisation delivery system. The achievement of the vaccine coverage target is publicised to recognise the clinic's achievement. There is a focus on results against set targets and comparison with peers. Data are presented as a challenge, not a threat. In addition, the results are widely published so that friendly competition is encouraged. Clinic is compared with clinic, district with district, county with county and state with state. AFIX uses the power of competition between individual doctors, practices, districts, counties and states by publicising vaccine coverage results. If a clinic achieves 90% vaccine uptake, it is awarded a special plaque for the surgery wall, or district or state office, from CDC or the organisation responsible for the program. This is one way the state of Georgia has improved its immunisation levels recently with dramatic improvement in reduction of missed opportunities.

#### *5.3.3 Surveillance of Adverse Events Following Immunisation: the USA model of VAERS*

This is a most important part of any program and ensures vaccine safety is monitored when vaccines are used in the field. Vaccines are tested during the research phase and must meet rigorous safety standards before being licensed for used in all the countries I visited. A system to monitor vaccine safety should also exist in order to ensure the expected type and level of reactions to licensed vaccines do not increase above the expected level, and to ensure new or previously unknown side-effects can be found if they should occur. The relevant authorities have withdrawn vaccines from use in the community on the basis of an increase in the rate of adverse events following use of a vaccine or other drugs. I was impressed by both the IMPACT system in Canada and the VAERS system in the USA but I will only discuss the latter in this report.

In the USA, the Vaccine Adverse Events Reporting System (VAERS) is managed by the National Immunisation Program (NIP) at the Centers for Disease Control and Prevention. Dr Robert Chen is the Chief, Vaccine Safety and Development Activity and VAERS is part of his responsibility. VAERS is a passive surveillance system. One of the aims of VAERS is to monitor known adverse events but there is no need to try to find every case. To test whether the surveillance system is effective and sensitive, you can compare the rate of a known event per 100,000 doses administered of the specific vaccine with the rate of that event that is reported in the surveillance system. If they are the same, the system is highly sensitive. For example, in South Australia the rate of hypotonic-hyporesponsive episodes following DTPw has reduced parallel to the reduction of the number of doses of DTPw distributed since 1997 (when SA changed to DTPa for all 5 doses in the schedule). This would demonstrate that the SA vaccine adverse events surveillance system is sensitive enough. Any VAERS should not prompt the condition to be reported. The system should ask

parents and providers to report “any serious adverse events the parent or vaccine provider thinks is associated with a vaccination”.

Another way to check the effectiveness of the reporting system is to analyse the data to ensure only the most severe or serious conditions are being reported rather than minor side effects. A passive system with specific case definitions may not find new, previously unknown and severe vaccine side effects and the immunisation program also needs a system of active surveillance to search for serious conditions. A check should then be made to find if any vaccination has been administered prior to the onset of that condition (through some type of data-linkage process). This active surveillance system should be based on the methods used in the Canadian IMPACT system. NIP is currently improving the US active surveillance system. NIP uses Health Management Organisations (a group of health service providers and enrolling patients who will use all the services within the group) as the basis of the NIP data-linkage project. The HMO captures a defined population and any adverse event following a vaccination provided within the HMO can be linked to any other condition that may occur after the vaccination. NIP conducts active review of the clinical records within a number of these HMOs to try to link any serious adverse event to any vaccination given. We could pilot a similar system in South Australia by linking hospital discharge records (not as useful as admission records) to vaccination data collected on the Australian Childhood Immunisation Register for the children who have been diagnosed with the specific conditions.

There are many reasons that surveillance of vaccine adverse events following immunisation, is a necessary component of an effective immunisation program. These include providing an alternative view to the anti-immunisation lobby. In this respect, monitoring conditions related to vaccination are an important aspect of vaccine safety. Monitoring reactions confirms that vaccines are safe.

Dr Robert Chen conceptualises the different views of the anti-vaccination and pro-vaccination groups as follows: the pro-immunisation groups focus horizontally on comparing disease outcomes with outcomes of vaccination. On the other hand, the anti-vaccination groups have a vertical approach, where they concentrate on vaccine adverse events and ignore the impact of vaccine-preventable diseases. Through a process of monitoring the side-effects of vaccination and comparing these rates with the rates and impacts of side-effects from complications due to vaccine-preventable disease, data are produced on the real safety of vaccination. However, this information must be widely distributed to health professionals and the community alike to ensure continued confidence in the national immunisation program. Surveillance and feedback on data from the side effects of vaccination must be treated in similar ways to the surveillance and feedback of data on vaccine-preventable diseases.

In USA about 98% of the data on adverse events following vaccination are collected from vaccine providers and only 2% from parents. The system must be seen in the light of the USA National Vaccine Injury Program under the *National Childhood Injury Compensation Act 1986* which I have described elsewhere. The surveillance of adverse events following immunisation is especially important for USA because immunisation is mandatory prior to school entry under all state legislation. Vaccine providers report because they are concerned about the legal ramifications of not doing so. More effort is being made to improve the feedback mechanisms to vaccine providers that report. The system we have in South Australia where a personalised system of feedback to parents and providers is a good model to be continued according to Dr Robert Chen. A national adverse events surveillance system was implemented in Australia in early 1994 but has not been made to work effectively with most states under-reporting and using different methodologies to collect data. A new system has been proposed and we need to implement it urgently and commit ourselves to an evaluation within 2 years of commencement.

## 5.4 EDUCATION OF COMMUNITY AND PROVIDERS

Education of community and vaccine providers must be seen as an essential component of an effective immunisation program. Education must be sustainable and based on current scientific evidence. From my Fellowship I believe that the NZ models of academic detailing by local immunisation coordinators and a central immunisation advisory centre were enhancements needed in Australia to ensure sustainable education of the service providers. The process of professional education in the UK and USA and the UK model of community education held important lessons for Australia. In addition the USA model of risk communication based around vaccine safety is an important aspect to consider for Australia.

### 5.4.1 *New Zealand; Immunisation Advisory Centre and academic detailing by Local Immunisation Coordinators*

As a result of the NZ *National Immunisation Strategy* (1995), a number of professional education initiatives have now been implemented. The Health Funding Authority (HFA), which purchases health services for the NZ Ministry of Health, has contracted the training of nurse immunisation to a specific organisation. The Immunisation Advisory Centre (ImAC) has been established and is funded by the HFA to provide education support of all vaccine service providers and local immunisation coordinators. ImAC promotes high quality immunisation standards of service through education of the community and service providers. ImAC also produces community education material and translates pamphlets into Maori and Pacific Islander languages. Standards of immunisation education have been published as well as cold chain standards and standards of immunisation. A telephone hot-line is part of the centre's operations and immunisation specialists answer clinical calls from vaccine providers across NZ about any aspect of the program. ImAC sets quality standards by professional leadership and education for all vaccine providers and also provides support to the Local Immunisation Coordinator who are based in the Independent Practitioners Associations (IPAs).

I have introduced the NZ role of Immunisation Coordinators in section 5.2.1. The main role of these people is 'academic detailing' through field visits to general practitioners' surgeries in their districts. This has been proven to be an effective means of timely communication to general practitioners and other vaccine providers in specific local areas. Vaccine providers need rapid support (via phone or a visit) to get answers on vaccine catch-up, contraindications and a way to report adverse events. The coordinators also conduct regular practice visits to conduct education workshops, evaluate the vaccine-cold chain and to communicate any changes to the vaccine schedule and other clinical guidelines. Although vaccine providers need education workshops they also need regular personal contact with a technical expert. The usual method of communication with doctors has been to mail information, even though this method has been demonstrated to be cost-ineffective. Doctors are often too busy with too many competing priorities to read mailed information. A system of direct assistance has been the best way (although expensive) to ensure doctors vaccinate children and adults in a timely and quality way.

All IPAs in NZ have had Immunisation Coordinators for the past 5 years. The idea grew out of a visit from Dr Norman Begg from UK and has similarities to (and differences from) the UK Health Visitor role. Recently the NZ government conducted a review of these positions and have decided to continue funding the positions and to enhance them so all IPAs take a consistent approach to their role. In addition, the NZ system will add a new regional link between the Immunisation Coordinators at the local level and new group of regional immunisation coordinators who will be working closely with the relevant national immunisation authorities. NZ now has invested in the necessary infrastructure for both vertical and horizontal coordination of the program and this will lead to active management through the whole national immunisation program. NZ will now be

more in step with immunisation infrastructure development in both USA and UK. I believe Australia needs to also adopt these models as a way to built the missing local and regional infrastructure. In 1998 SA implemented Local Immunisation Coordinators based in Divisions of General Practice. This model is based on various aspects of the roles I saw in NZ, UK and USA.

#### 5.4.2 *United Kingdom: the Health Education Authority and evidence-based and sustainable education of professionals and the general population*

I interviewed and spent the day with, Mr Michael Corr who was in charge of the UK's integrated system for community immunisation education. This system is closely linked to the rest of the UK Immunisation Program headed up by Dr David Salisbury who works in the Department of Health

The Health Education Authority (HEA) has 3 main roles:

- Educational support for parent through broadcast and print media
- Support of health professionals
- Research to support the 1st two functions

The HEA has the following core activities in immunisation

- Research and evaluation on the knowledge and attitudes of parents and vaccine providers to immunisation;
- Strategic planning for immunisation education of parents and vaccine-providers;
- Conducting education campaigns focused on particular issues that arise from time to time (based on current market research);
- Immunisation publications for vaccine-providers and parents;
- Writing standards and clinical guidelines for immunisation practice;
- Integration of current research and technical knowledge into education strategies for parents and vaccine providers; and
- General health promotion.

The HEA is effective because of the political and resource commitment from the Department of Health. The HEA provides the technical knowledge and support that helps to drive the management system which underpins the UK Immunisation Program. The HEA is funded in a sustainable way.

Policy decisions made in the Department of Health for the Immunisation Program are underpinned by evidence. The evidence is often collected by the HEA and provides the accountability for the public funding used in the program. Education of vaccine providers and parents is integrated and managed as part of the whole immunisation program.

#### 5.4.3 *USA: The Centers for Disease Control and Prevention: a model of sustainable professional immunisation education*

The most sophisticated model of professional education on immunisation I saw took place in the USA. Dr Bill Atkinson at CDC runs regular quarterly national education seminars by satellite hook-up across the USA. Large groups of vaccine-providers gather at pre-organised venues and sign in for education credit points. An education presentation is broadcast live by satellite across USA from CDC in Atlanta. The audience watch on huge TV screens in rooms equipped with phones and fax machines. Each session focuses on a specific immunisation topic and there may be one or more national experts on the topic present in the CDC studio. Sometimes the live broadcast

includes a panel of speakers. The national audience then participate by asking the speakers questions that are faxed or phoned in throughout the presentation.

The session is also videoed and vaccine providers can access free copies of the video which they can use for later education sessions in their organisation. In addition CDC publishes a book that based on a number of these seminars. It is known as the 'Pink Book' and a new edition is published yearly. All this information can also be accessed through the CDC National Immunisation Program website.

Though expensive, this model of professional education deals with the barrier of distance and ensures all vaccine-providers can obtain current, consistent technical knowledge at the same time. It also means the national experts who are not available to travel around the USA, are able to pass on knowledge to a whole range of health professionals in a cost-effective way. Even though it is expensive, the cost should be compared with the current methods (often very cost-inefficient and ineffective) that are currently being used in Australia.

#### 5.4.4 *Risk communication related to immunisation: USA—managing 'outbreaks' of fear of immunisation*

The information that follows came from interviews with Beth Hibbs and Dr Robert Chen at CDC in Atlanta. USA has the only process that dealt with risk communication as a separate education issue.

Vaccines are not 100% safe and side effects occur, though rarely. The challenge continues to be how best to translate the communication of rare risks in order not to frighten people. The challenge is to conceptualise risks and benefits from a public perspective since a health professional perspective will always be limited by their own beliefs in the merit of vaccination. The whole issue of risks of vaccination compared with the risk of complication of vaccine preventable disease is even more difficult if a country makes immunisation compulsory. The management of the communication of risks when immunisation is mandatory (in the USA) will differ if immunisation is voluntary (the UK or Australia). It is important not to concentrate all your efforts on trying to change the beliefs and attitudes of the small minority who oppose immunisation. Like Australia, in the USA these people account for about 1.5% of the population. It is important to concentrate on the 20-30% of the population who do support immunisation but (a) their children are not fully immunised for other reasons (differing priorities etc) and (b) they are not sure why they support immunisation. The remaining 70% of the population do not need to be convinced but need adequate current information to make informed choices prior to consenting to be vaccinated.

A workshop was conducted in Washington DC in 1997 that discussed this issue of risk communication and vaccination that was sponsored by the Institutes of Medicine. Risk communication was seen as an interactive process of an exchange of information and opinion among individuals, groups and institutions. To be effective, risk communication must address the experiences, beliefs, values and attitudes of message recipients as well as providers. Understanding how risk are perceived and the inherent biases of both messages to vaccine-providers and recipients were seen as the key to good risk communication. The three main themes of the workshop were:

- risk communication is a dynamic process in which many participate, and these individuals are influenced by a wide range of circumstances, interests, and information needs. Good risk communication should reflect the goals of the communication and can include advocacy, education, and development of a decision-making partnership;

- the goal of risk communication should be informed decision-making. Consent for vaccination is truly 'informed' when people know the risks and benefits and make voluntary decisions; and
- there is often uncertainty about estimates of risk associated with vaccination and these must be stated and the risks must be quantified as much as possible. Trust is the key component and health professional must not understate a risk from a vaccine if the risk is known.

Dr Robert Chen and Beth Hibbs from the Vaccine Safety and Development at the National Immunisation Program reflected the findings of this workshop. There are a number of ways to ensure risk communication is more effective:

- tailoring the communication of risks to audience needs, abilities and interests;
- improving the format and structure of printed material;
- presenting more balanced information;
- adding references and bibliographies to communications;
- and providing estimates of the likelihood of risks when known, while stating the uncertainty of other risks about which less is known. (Board of Health Promotion and Disease Prevention, Institutes of Medicine, *Risk Communication and Vaccination, Summary of a Workshop*, National Academy Press, Washington DC 1997).

I found that all the immunisation educational material produced for the community by the National Immunisation Program, reflected these outcomes of the workshop.

Risk communication of vaccine side effects and disease complications can be managed and disseminated through the following strategies:

- using all types of media (print, electronic and paper etc);
- using websites;
- publishing a question and answer sheet on specific issues in a proactive way;
- the CDC regularly browse the scientific and medical literature and the mass media to assess what the immunisation issues of the moment are and put a communication strategy together and disseminate the information in a timely way before the issue escalates and forces a defensive approach;
- they treat the specific risk issues like an 'outbreak of fear' rather than an outbreak of disease. Whenever the program manager wants to deal with these outbreaks of fear a group including an immunisation expert, an immunisation manager, a disease expert (specific to the vaccine-preventable disease you are dealing with) and a communication expert (media or health promotion person), reviews the situation and develops the plan of action to deal with the 'outbreak'. The strategy is implemented quickly, preferably within 24 hours; and
- CDC also know what the anti-vaccination lobby are concentrating on and manage the issue in an open and unbiased way. They deal with the issue and do not attack the messenger. It is important not to get personal and to be user friendly.

I believe each state and national authority in Australia must take this aspect of immunisation communication very seriously and ensure there is someone who has key responsibility for this part of the program. It should be seen as part of the communication about vaccine safety not just another part of the education system. In Australia we may do this occasionally in a haphazard fashion but we need to adopt a more systematic approach to risk communication.

## 5.5 PURCHASE, SUPPLY AND DISTRIBUTION OF SAFE AND EFFECTIVE VACCINES

All countries must purchase vaccine and distribute them in a way to ensure their potency. This component of an effective immunisation program also includes the development and licensing of new vaccines; the monitoring of vaccine safety after they have been licensed and then distributed for use in a country. It also requires a system of surveillance of adverse events after vaccines have been administered. I have dealt with these aspects in other parts of the report.

Vaccines must be purchased, stored and distributed across the immunisation system and there must be a system of 'cold chain' monitoring of the vaccines throughout the distribution network to ensure the vaccine maintains their potency. There must also be a system of monitoring wastage and usage of vaccines for financial accountability.

A best-practice model of vaccine distribution means that vaccines must be distributed to the door of vaccine providers while at the same time ensuring the vaccines are kept at a temperature between 2 to 8°C. The UK model of vaccine distribution and cold chain monitoring and the USA model of purchase and distribution through CDC were the most important in terms of lessons to be learned for Australia.

The leaders in cold-chain monitoring and effective vaccine distribution, are the World Health Organization (WHO), although the work they do relates mostly to developing countries. However, much of the work they have done is available to developed countries that may wish to improve the quality management aspects of their immunisation program. I was amazed to see just how much of the available knowledge on distribution and cold chain there is available (free) from WHO and how little of this is used in the countries I visited. In addition it was painful to see countries re-inventing the wheel about cold chain when most of the work has been done by WHO on finding the best technologies and practices. Australia is fairly conscious of cold chain requirements although quality management of this aspect of the program is not systematically applied throughout the country.

### 5.5.1 USA: purchase and distribution system

All the USA states purchase supplies of vaccine through an arrangement with the Centers for Disease Control and Prevention (CDC) in Atlanta. This system is linked to the overall funding of their immunisation programs

CDC manages a national tender for the purchase of all vaccines used throughout the USA and then provides grants to the states and territories under the US Public Health Service Act. Under this Act the CDC and the federal Government also negotiate a service agreement for the purchase of vaccines for children. An interesting aspect of the USA system of vaccine purchase and delivery is the strategy used by the National Immunisation Program (NIP) to distribute vaccines to 17 participating states. The process is centralised, with NIP controlling the distribution and tracking the funding from Atlanta.

Once the federal government has provided the NIP grant and the Immunisation Action Plans have been finalised between NIP and the states (see Section 5.2.2), staff within NIP allocate the vaccine purchasing budget for each state. Local vaccine providers in each state, place orders for their vaccines to the Program Support branch of NIP (CDC) in Atlanta. The order is entered into a software package at CDC called VACMAN. This package tracks the orders and controls the distribution of the stock. The order is sent electronically from CDC to the vaccine manufacturer who has 15 days to ship the vaccine direct to the local vaccine provider regardless of where the state is. At the same time the cost of the vaccine order is entered against the vaccine funding line for that particular state. In this way the NIP does not need to provide the funds to the states for them to administer. This system reduces the administrative costs and the costs for vaccine storage

and distribution within the state and county health departments. At the same time, the vaccine is delivered direct to the local vaccine provider within 2 weeks of the order. This is a very cost effective vaccine delivery system and could have implications for other countries with state/federal funding systems.

5.5.2 *United Kingdom: Farillon - a model of best-practice of vaccine purchase and distribution systems which ensure the vaccines are potent.*

Farillon is a private company that distributes pharmaceuticals. Farillon has been awarded the contract from the UK Department of Health to distribute all the free vaccines on the Standard Immunisation Schedule. Farillon is situated in Romford in outer London. It consists of an office block attached to an enormous warehouse that encloses a number of large cold-rooms that are used to store all the UK vaccine stocks. There is a wide variety of trucks, trailers, vans and lorries parked out the back with their distinctive orange and white logos. Each day these (mostly) refrigerated vehicles are dispatched with their cargoes of vaccine to be carried to the door of vaccine providers across the country. All providers in the UK get their vaccines delivered to the door from this place. Farillon receives vaccines orders by phone, E-mail, fax or phone and sometimes even by mail.

Mr Max Evans is the friendly and efficient director of this multi-million pound business. All vaccines used in the UK must be handled and administered in the standard way set down by the Department of Health and published through their Immunisation Handbook. Farillon is contracted so that their services must be carried out in line with the quality standards published in the Immunisation Handbook and other publications.

Farillon has been distributing vaccines for the UK system since 1992. Prior to this, hospital pharmacies held vaccines and providers had to pick them up. Farillon distributes to 10,000 delivery sites across the UK. Sixty per cent of vaccines are distributed to doctors surgeries directly and the other 40% go to hospitals where providers still have to pick up their vaccines. They are working towards reducing this latter process.

The cold chain is monitored during transport by electronic monitors built into the cold-trucks and vans and drivers must monitor and be accountable for these readings.

All vaccine providers are encouraged to monitor cold-chain but there is still some work to be done in this area. The most innovative and new strategy that Farillon and the Department were piloting in relation to the monitoring of the cold chain at the surgery level was as follows:

- An electronic thermometer probe sits inside a vaccine-providers fridge at the pilot sites;
- The thermometer is linked to the computer in the surgery. Almost all UK surgeries are computerised and they can order their vaccines direct from Farillon via this special software built by Farillon. This software also monitors the thermometer readings in the surgery refrigerator;
- When a provider sends an order to vaccine to Farillon, the current reading of the electronic thermometer is constantly displayed on the screen at the receiving end in Farillon;

Farillon staff can often tell a surgery that they have a fridge problem before the staff in the surgery are aware of the problem. If the fridge is too cold or too hot, Farillon will not dispatch vaccine until they see the temperature stable at between 2 to 8°C.

This is an efficient and effective model for monitoring cold-chain in the peripheral parts of the immunisation system and could be adapted for use in Australia.

## 5.6 PUBLIC AND TECHNICAL POLICIES (INCLUDING LEGISLATION) THAT SUPPORT IMMUNISATION

Public and technical policies that support immunisation are another core component of effective immunisation program. These policies might include: immunisation handbooks, clinical guidelines, standards, national and state immunisation plans, funding documents, legislation and management policies. These documents should be easily available and understood by program managers and the vaccine providers throughout the immunisation system. Immunisation activity should reflect the policies and legislation agreed to by the relevant stake-holders. All countries I visited had a commitment to this aspect of the program although the emphasis and processes for implementation differed. Australia too has a range of policies and legislation that underpins our immunisation programs although it has been my observation that although program managers and others may agree with the policies and legislation they are not always put into action.

Examples of public policies that support immunisation programs include any consensus documents, guidelines or recommendations that have been developed that provide leadership and direction to the managers and immunisation service providers. There are many examples including:

- scientific recommendations; for example *the Australian Immunisation Handbook* or the Advisory Committee on Immunisation Practices' (ACIP) *Recommendations* in the USA;
- legislation like the state legislation in USA that makes immunisation compulsory before school entry or the no fault compensation legislation in the USA;
- all countries have a document called *Standards for Immunisation Practice*;
- all countries have national vaccination schedules;
- strategic planning documents or policy statements are a usual feature at the local, state and national levels;
- best practice clinic protocols like recommended injection technique can be found in many countries; and
- funding agreements or goals and target statements were widely used.

These types of documents should be the tools of trade for immunisation coordinators or manager within an effective immunisation program. The difference between effective and ineffective immunisation programs is the extent to which the information in the documents is put into practice.

While I did not find one country was better than another in the production of these types of documents or legislation, the differences I noticed was how the effective immunisation programs act on the policies and legislation. The USA has an highly effective mechanism for forming national clinical guidelines on the use of vaccines by doctors and nurses through ACIP. The USA no fault compensation legislation is a model that should be adopted in all countries that believe in the need to ensure public confidence in immunisation programs is maintained. I have already discussed the USA funding agreements for immunisation service delivery and vaccines. In this section I will highlight only the ACIP process and the no fault compensation legislation related to vaccine injury, as models that might help Australia improve its immunisation program support.

### 5.6.1 USA: ACIP recommendations and No Fault Compensation Legislation for Vaccine Injury.

#### (a) Advisory Committee on Immunisation Practice (ACIP)

The peak organisation that publishes clinical policies and guidelines for immunisation in America is the Advisory Committee on Immunization Practices (ACIP). The Australian equivalent is the Australian Technical Advisory Group on Immunisation. The American College of Pediatrics also publishes immunisation guidelines which are increasingly being integrated with ACIP guidelines. The National Institute of Allergies and Infectious Diseases, the Institutes of Medicine and the Federal Drug Administration are all involved in vaccine research, development and licensing of vaccines. There are strong links between all these organisations to ensure there is a strong scientific base to the clinical guidelines on how vaccines should be used in the USA. ACIP is responsible for the development of the USA Standard Vaccination Schedule. ACIP is the 'parent' committee where final recommendations are put together just before publishing and distribution. However much of the work is done by various types of expert panels that usually concentrated on one clinical aspect of the immunisation schedule. For example there are working groups or expert panels on pertussis, measles, general clinical recommendations (eg injection technique, cold chain etc), new vaccines and so on. Vaccines are only purchased and distributed as part of federal government immunisation initiatives, if they have been recommended by ACIP.

In Australia we build our recommended schedule based on the available vaccines, and these are different from those available in the USA. Because of the availability of resources in the USA, ACIP is able to dictate to the drug manufacturers what they want in terms of vaccines to meet the needs of their schedule. This is opposite to the Australian situation where we are reliant on the manufacturers' commercial decisions on whether they will put a vaccine on the market in Australia.

The Australian equivalent to ACIP is only one committee and I believe there is a need to reconstruct our expert committee to ensure a number of expert panels are set up in a systematic way so that our committee is better prepared to make the complex decisions in a more comprehensive way.

#### (b) No Fault Compensation Legislation Related to Vaccine Injury (USA)

Serious life-threatening medical conditions can occur following immunisation although they are exceedingly rare. When compared with the risk from complications (including death) that can and do occur when a person (or child) has a vaccine-preventable disease like measles or pertussis, the risk associated with serious side-effects following vaccination, are very much rarer. However, it is true that occasionally one person in every 100,000 or 1 million doses of vaccine administered, may end up with a life-threatening condition or even a disability from the vaccine, in order for the rest of the community to be free from death or disability from the diseases the vaccines prevent. In USA and NZ, governments have recognised this rare but real risk and have put into place a means of compensation that is available to those people who are injured in some way by the national immunisation program. This seems a highly ethical, honest and moral way to conduct a national immunisation program.

The National Childhood Injury Compensation Act 1986 established the National Vaccine Injury Compensation Program (VICP) which came into effect in October 1998. This is the US federal government's no-fault legislative initiative that has been designed to compensate those individuals or families of individuals who have been injured by childhood vaccines, whether administered in the private or public sector. I obtained the following information from Dr Geoffrey Evans, Chief Medical Officer, National Vaccine Injury Program, US Department of Health and Human Services in Washington DC. The VICP was implemented because of

- the alleged diphtheria-tetanus-pertussis (DTP) vaccine-related injury and death (this allegation was not substantiated);
- the dramatic increase in DTP-related lawsuits;
- withdrawal of vaccine manufacturers from the market;
- resultant drop in vaccine shortages (with increases vaccine prices); and
- the demand for a national solution for the problem.

A claim can be made under the legislation for any injury or death thought to be a results of a vaccine specified in the Act, including DTP, DTPa, DT, TT, Td, MMR, polio, Hib and varicella. These injuries may include anaphylaxis, paralytic polio and encephalopathy. Only injuries resulting from a vaccine administered on or after 1 October 1998 can be claimed for. Under this Act, doctors are required by law to report adverse events following immunisation. The VICP awards are paid from the Vaccine Injury Compensation Trust Fund, funded from an excise tax on every dose of covered vaccine that is purchased. The Program is administered jointly by the Court, the Department of Health and Human Services (Washington DC), and the Department of Justice (DOJ). An individual files a petition for compensation with the court. A physician at the Division of Vaccine Injury Compensation (DHHS) reviews each petition to determine whether it meets the criteria for compensation and a recommendation is made to the court. A hearing before the DOJ and an initial decision for compensation under the Program is made. As of July 31, 1997, a total of 5,169 petitions have been filed (73% for DTP, 14% for MMR, 10% for IPV or OPV, 1% T or Td or DT and 2% other. The VICP protects vaccine providers and vaccine manufacturers. There is a Vaccine Injury Table that lists specific injuries or conditions and the time frames in which they must occur after vaccine administration. This Table provides a legal mechanisms for defining complex medical condition and allows a statutory 'presumption of causation'.

The outcomes of the VICP include compensation (recognising that a very few individuals will suffer vaccine side effects so that the majority can remain free of disease complications), process improvements (eg negligence allegations removed) marketplace stabilisation (eg new products are being licensed) and decreased civil litigation.

I believe this is a system that Australia should have as it undercuts the anti-immunisation lobby and shows a transparency in the Immunisation Program. Vaccines are not 100% safe and as Australia gets closer to the target of 100% of the population fully immunised, the only risk that will remain will be the rare but real, side-effects from vaccination. We need to deal with this in a pro-active way. More information of the US program is available from:

National Vaccine Injury Compensation Program  
Parklawn Building, Room 8A-35  
5600 Fishers Lane,  
Rockville, Maryland 20857, USA

Or the website: <http://www.hrsa.dhhs.bhpr/vicp>

Legislation also exists in the USA that makes immunisation compulsory prior to children starting school. This mandatory immunisation strategy has been implemented through states' *Public Health Acts*. Parents can opt out of mandatory immunisation for religious reasons but there is no 'opt off' clause for conscientious objection. All vaccines on the US standard vaccination schedule are mandated under the legislation in every state. When a new vaccine is added to the schedule, each state must amend their relevant legislation to include the vaccine in the mandatory aspect of their Immunisation Program. The states are not consistent in their approach however, and some states mandate for some vaccine and not others. In addition most US states must develop

information for parents on vaccines that all vaccine provider must give (by law) to all parents (or vaccinees) prior to a child being immunised.

Australia should reconsider a type of no-fault compensation for vaccine-related injuries. I do not believe that the Australian public or politicians will make immunisation compulsory by law. Four states (NSW, Victoria, ACT and Tasmania) already have made changes to their Public Health Acts that require children to show current immunisation records prior to school or child care entry. However, this is compulsory immunisation record-keeping and the Public Health Acts in these states also require child-care centres and school to notify outbreaks of vaccine-preventable disease. Unimmunised children can then be required to stay at home during the outbreak until public health authorities give permission for the children to go back to school. I believe this is a satisfactory compromise and also encourages parents to keep their children's immunisation records up to date. I believe the remaining states (Queensland, Western Australia, South Australia and the Northern Territory) should follow the other states and implement the same type of legislation.

## 5.7 COORDINATION AND MANAGEMENT OF THE IMMUNISATION SYSTEM INCLUDING VERTICAL AND HORIZONTAL LINKS

The last and in many way the most important core component of effective immunisation program, is active coordination and management. This includes a system of effective coordination vertically (ie. national, regional/state and local) and horizontal (among stake-holders across each of these three levels). Without this all the other 6 core components of an immunisation program that I have already discussed, operate in a vacuum and are not linked.

There are many players, committees, groups (public and private) at each of the different levels within any immunisation program. They must be drawn together, orchestrated, led, or managed towards achieving the outcome (reduction of disease). I do not believe in 'content-free management' or what Dr David Salisbury (in the UK) calls "passive immunisation program management". All effective immunisation managers that I saw overseas (at any level), were both technically competent and had excellent organisational and management skills. They were diplomatic, politically sophisticated, knew how to get funds and were strong leaders. All effective coordinators or managers shared a vision on the basic features of the immunisation system. They could clearly list the components of their immunisation program and had a vision as to how it worked. The biggest 'take-home message' from my Churchill study tour (and one which I have always believed), is that:

*Immunisation management turns the words, the data,  
the information, the research, into ACTION.*

The greatest enemies for immunisation programs are fragmentation and lack of political commitment to sustaining immunisation programs. This is of course one of the reasons why Australia has done poorly until recently. In the USA, the UK and Finland, program managers and others I interviewed talked about the need for 'harmonisation', consistency and coordination as being important aims of immunisation management. All the effective programs I saw overseas articulated this belief that effective, competent management was essential and made the whole system work.

*So what does all this mean?*

There are essentially 4 types of relationship that are needed to be in place in order to effectively manage or coordinate an immunisation system, although the concepts are a bit artificial:

- **Vertical structures and processes:** these are the formal linkages or any structure or process which allows information (eg data, communication, funding agreements, lines of responsibility) to flow up and down to those involved between the different levels of the system (eg national to state or regional to local levels). This must be a two-way system. For example there should be a clear line of communication between the national and local program activities. Vertical structures and processes facilitate linkages between people at the top of the Immunisation Program who might be making national clinical recommendations or policy decisions, to those who manage or provide the immunisation services;
- **Horizontal structures and processes:** these are formal linkages, or any structure or process which allows information (eg data, communication, funding agreements, committees, lines of responsibility) to flow between the different individuals and groups who are involved within each level of the system (eg meetings between different types of local service providers with the aim of improving community access to immunisation services). These horizontal structures and process should support the flow of information both ways. Horizontal linkages ensure cooperation between different stake-holders at the same level. They allow information and communication sideways across the immunisation program. Another example might be a state-wide (or regional) committee representing different vaccine providers to solve state-wide immunisation problems;
- **Professional and community structures** that support immunisation should be explicit. If you are involved in immunisation, regardless of where you are in the system, it helps to know a bit about who else is involved and what their responsibilities are. For example the roles and responsibilities of individuals like a Local or District Immunisation Coordinator in relation to the state/regional or the national immunisation coordinator. What are the roles and responsibilities of other organisations or committees in the system (eg Local Government in Australia or Crown Health organisations in NZ). Professional and community structures can be individuals, organisations, committees, formal partnerships, bureaucracies, governments or groups; and
- **Professional and community processes** that support immunisation should be known to those involved in immunisation and these processes should also be effective. These processes might include formal or informal feedback, meetings, reports, funding agreements, evaluation documents, published material or informal communication and networking etc.

The management and coordination component is the most important part of the immunisation system. It is the ‘mortar between the bricks’ of any immunisation program. Management links all the components together. I should say good management does this. Good or effective management turns words into action! Good managers or coordinators with key responsibility for their part of the immunisation program must be visible at each level of the system. Each of these people must focus on each of the individual components from time to time but they must also aim to provide a link between *all* the other components in the Immunisation Program or system in order for it to actually work. I believe passionately that an effective immunisation manager or coordinator must be technically competent to be able to provide effective leadership and management. Good management links all the components I have mentioned into one interdependent system aimed at high vaccine uptake and good quality services. Management is a process which cuts across and incorporates the elements of an effective immunisation program. A commitment to effective management should be visible at the national, state and local parts of any effective immunisation program. Countries or regions or local immunisation programs which were effective had effective management systems—they knew where they were going and they knew when they had got there.

NZ, the USA, the UK and Finland all had the best models of local, state or national coordination and management. This is where we are weakest in Australia.

*5.7.1 New Zealand: a best-practice model of program coordination at the local level involving public and private sector providers (NZ)*

The NZ model of the immunisation coordinator is the model which would be most appropriate for implementation in Australia. The Immunisation Coordinators are funded by the Health Funding Authority and are placed within the Independent Practitioner Associations (similar to our Divisions of General Practice). They coordinate a wide range of practice issues and offer education and clinical support to general practitioners who are part of their Association. Practice visits are made regularly to check the cold chain, troubleshoot, and educate general practitioners and nurses. The Coordinators help to set up local registers or recall-reminder systems for vaccination. There is emphasis on building personal professional relationship and on providing timely and meaningful feedback to doctors, something we are not good at in Australia.

The NZ local or district immunisation coordinators' role is about 5 years old and the most successful coordinators advised me that it takes about 12 months of diplomatic and careful visits to general practitioners' clinics to establish the role and gain acceptance. Almost all the doctors were suspicious and defensive to begin with. Once established, the doctors and practice nurses appear to have embraced the Immunisation Coordinators with enthusiasm. The role is one of 'service to the service providers'. The most important aspect of the role is feedback to doctors of any information relevant to quality service. Coordinators are the single most important aspect of immunisation I saw in NZ and provided the infrastructure needed to link what are usually quite autonomous and separate service delivery sites within local areas. These people are also able to link up with the national immunisation authorities.

The problem with the present Immunisation Coordinator positions in NZ, that was identified by a number of interviewees, is that there was no horizontal coordination between the various IPA Immunisation Coordinators and no clear link to the other regional stakeholders (ie lack of vertical and horizontal linkages between those involved in immunisation).

The Immunisation Coordinator role has been reviewed this year (1999) by the Health Funding Authority and recommendations have been made to enhance the role and ensure it is more consistent across the country. In addition the report recommends Regional Coordinators be established and links to the national stakeholders. The Coordinators are widely accepted by both private general practitioners and public health practitioners. There are some problems in that the coordinators are working alone and have no structure to link them systematically horizontally and there are no clear links to the Ministry of Health or the education organisations (Immunisation Advisory Centre) and this seems to lead to an uncoordinated and non-consistent approaches to policy implementation and professional isolation. The Coordinators have a conference every year that encourages networking and provides support and education update. The NZ model seems to be a bottom up approach although it has weak central authority and lack of links horizontally at the local levels. However, these problems will be resolved if the recommendations made by the recent review are implemented.

*5.7.2 USA: Regional Outreach Coordinators (ROCs), a best-practice model in collaborative horizontal local links between public and private sectors*

Following the huge measles epidemic in the early 1990s, one of the strategies implemented to improve vaccine coverage was to introduce Regional Outreach Coordinators (ROCs) across USA. These people are funded by the Centers for Disease Control and Prevention (CDC) and are placed

with various states with the State Immunisation Coordinator. The program has been in place since 1995.

Shaunette Crawford was the Director of Community Outreach and Planning within the US National Immunisation Program and I interviewed her in May 1998. I also saw ROCs in action when I visited Sandra Cox, the regional immunisation coordinator in Montgomery County, Maryland (USA) which was near Washington DC.

The ROCs program is only 3 years old. The program brings in skills and knowledge from behavioural sciences. ROCs have a background in public relations and behavioural science. Since most of the state Immunisation Coordinators are from medical, nursing, management or epidemiological backgrounds, the ROCs are subject to a lot of scepticism and cynicism.

The aim of the Branch and the ROCs is to incorporate the community more into the National Immunisation Program. The ROCs coordinate or facilitate groups with the aim of building coalitions of people to work together to improve vaccine uptake. They work with private individuals or groups like Rotary (service organisations), businesses, state and county (local) immunisation program stakeholders, schools, community and parent groups, with the aim of mobilising community support for immunisation to provide a pro-immunisation perspective. They assist community groups to set goals to support immunisation and help they find ways to work to improve immunisation rates within their own communities. They mobilise private sector resources to support the added-value aspects of the program like health promotional material (eg posters, give-aways, bumper-stickers etc).

ROCs were put into place to provide an answer to the question: How can existing providers work better with other organisations and individuals in the community to increase vaccine uptake? The ROCs' work focuses mainly on:

- Media management and general health education;
- Managing and selling ideas about the positive aspects of immunisation;
- Working with people from the Vaccine Safety and Research Division of the National Immunisation Program (CDC, Atlanta) to communicate the real risks of adverse events after vaccination (from the VAERS system of adverse events surveillance). They communicate the general ideas of risk and benefits and to demonstrate the positive aspects of vaccine adverse events surveillance system;
- Promoting links between the public and private sector organisations for unfunded extras (promotional activities for example);
- Working with the community of clients to ensure the providers hear what they need to know in order to access the vaccines and knowledge about the vaccines;
- Linking community groups, private sector, public and private vaccine providers and government organisations who are all stake-holders in the Immunisation Program.
- Conducting their role through field work across the state by working closely with the local immunisation service providers and state and county health authorities who are responsible for the immunisation program. They visit various private and public organisation to build networks and financial support between the various sectors at a local, regional or state levels. They facilitate coalitions through regular regional immunisation meetings to plan immunisation activities at the local level;
- Involving the clients more with the decision making within the Immunisation Program;
- Funding community organisations to conduct immunisation activity that has meaning for them. ROCs help to mobilise community support for immunisation;

- Targeting minority groups and working with them in a very personalised and culturally specific way to improve vaccine uptake within those groups. The ROCs then take this information back to state program managers and CDC to assist them to provide appropriate service delivery systems;
- Working with vaccine providers organisations to set up structures that will help motivate peers to ensure that high quality services are provided to the community. Low level competition between providers is encouraged. For example, specific rates of immunisation are published in newspapers for certain organisations or and doctors surgeries to ensure the public know what they are missing out on. The data are collected from the AFIX/CASA system (this is described elsewhere in this report);
- Building strategies to ‘normalise’ immunisation among the community rather than the use of coercion to ensure providers vaccinate;
- Promoting immunisation through National Immunisation Week that supports over 400 local immunisation activities across USA during this week each year;
- Funding pamphlets and a parent hotline and a range of other community education activities. However ROCs are ‘shoe leather’ health promotion people. Some of this activity is funded by private sources.

There is much to learn from the ROCs model of local and regional coordination that could be adjusted for the Australian system. There is no reason why the horizontal links between the private (non-health professional) and public sectors cannot be improved. There may be alternative sources of funding for promotional activity from public monies. ROCs or some the parts of the role could be adapted to the already existing South Australian model of Local Immunisation Coordinators that have been based in the Divisions of General Practice in mid-1998. Regional immunisation committees could be set up to improve the links between the vaccine providers but these could also involved the business and service organisations. Rotary for example, is often trying to find new projects to fund.

### *5.7.3 United Kingdom: Health Visitors and regional Immunisation Coordinators, a best-practice model in horizontal and vertical program links.*

I have already mentioned the role of the District Health Visitor in the UK in sections 5.1.1 (b) and 5.1.2 (b) (although Judith Morton was mainly the district immunisation coordinator she often doubled as a Health Visitor). Health Visitors are a visible link between vaccine-providers and the community in general. These people chase up overdue children and ensure they are vaccinated on time by the parents nominated general practitioner. They are another link between the District NHS Trust and the parents and the vaccine providers. While they did not necessary have the responsibility to ensure all the providers were linked (this was done by the District Immunisation Coordinator), they were a link between the parents or vaccinees and the service provider. They were also made accountable and had to demonstrate adequate performance on the basis of vaccine coverage. Part of this role could be adapted to the Australian conditions and indeed I have used this knowledge in the formulation of the job description for the SA Local Immunisation Coordinators that a based in our Divisions of General Practice.

In addition the role of maternal and child health nurse (in those states with these staff) could be modified to include specific aspects of the UK Health Visitor model. These nursing organisations already have the infrastructure to follow up very overdue children. These children are usually belong to high-risk population. In SA we are working towards some changes within Child and Youth Health to carry out this function.

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## 6. SUMMARY OF FINDINGS AND CONCLUSIONS

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### 6.1 SUMMARY OF FINDINGS OR MAIN LESSONS LEARNED FROM THE CHURCHILL FELLOWSHIP

While I gained much new knowledge about immunisation programs I also found that my experiences confirmed much of what I already knew about program management and coordination. The following lists describes the main lessons I learned from the study tour:

- The core activities or components of all immunisation programs must be articulated and understood by those who are part of the system;
- The core activities or components of effective immunisation programs include:
  - ❖ Effective systems of service delivery so people can access the recommended vaccines. This includes the need to ensure special (appropriate) services are available that target overdue or high risk children or children with special needs, and a recognition that these special services may be more expensive;
  - ❖ Cost-efficient service delivery and vaccine funding system that ensure that the consumer does not have to pay for immunisation. Vaccines delivered to the door of the providers in a way to maintain vaccine potency. Vaccine prices should be negotiated nationally to keep the prices low. Vaccine purchase and distribution systems can be either national or state-based. Attention to the quality management of cold-chain is a central part of the process;
  - ❖ A system to measure the performance, quality and outcomes of the program and timely feedback of data and other information to immunisation providers and managers. There should be a consistent approach to disease surveillance. there must be national or state and regional strategies for measuring vaccine coverage although vaccine registers are the best. Both passive and active surveillance of adverse events following immunisation is essential and feedback and publication of vaccine safety data should occur to maintain public and professional confidence in the program. Risk communication is part of this process;
  - ❖ Education strategies for the community and vaccine providers should be evidenced-based and integrated with the rest of the program. They must be sustainable and not implemented in an ad hoc fashion. Multiple strategies are more effective than single strand strategies. Electronic multi-media technology can be used to ensure cost-effective education strategies that overcome the barriers of distance;
  - ❖ Purchase, supply and distribution of safe and effective (potent) vaccines;
  - ❖ Immunisation management systems and coordination vertically between levels of the program (national, state or regional, and local) and within levels (eg between providers at the local levels). Collaborative relationships throughout the system between public and private sectors. Local management and coordination is just as important as state and national management of the program.
- Needs assessment or mapping of the immunisation system is crucial so gaps can be identified and strategies planned and implemented in order to build and maintain the necessary immunisation program infrastructure. There must be a commitment to build the necessary infrastructure for the immunisation program;
- There must be political and resource commitment to ensure the active management of all levels of the immunisation system (national, state and local). All of the components of the immunisation system must be linked. The program must be coordinated between each of the levels of the system (vertical coordination and management) and between stake-holders within each level (horizontal management and coordination);

- Funding must be tied to demonstrated performance and outcomes of the program. These outcomes must include quantitative aspects (eg immunisation coverage, rates of adverse events etc) as well as the quality aspects (eg education of health professionals, vaccine adverse events surveillance, cold chain monitoring etc). Accountability at every level of the system is most important especially when resources are scarce;
- The use of normative incentives to motivate vaccine providers can be as powerful as financial incentives to improve the quality of the service and vaccine uptake;
- Computerisation is essential in service delivery sites and for program managers, for the collection and transmission of notification, vaccination and adverse events data and for more effective recall overdue children;
- There should be a close working relationship between the public and private sectors throughout the system and proactive, transparent strategies to benefit the immunisation program at each level of the system;

Feedback of results (eg vaccine coverage etc) must be carried out regularly and in a timely fashion to those who are the vaccine service providers;

Innovative but effective education strategies should be implemented for health professionals in order to keep them up to date with the rapid changes in immunisation recommendations;

National clinical guidelines must be made on the basis on all available scientific knowledge and effective and efficient strategies must be found to tap the available knowledge of experts;

Wide communication of the successes and failures of the program is necessary and the public must be reminded about the scientific foundations of the program. We do not be defensive with the anti-immunisation lobby but deal with them in an open and proactive way;

Legislation to compensate individuals and families injured by vaccines is an ethical and honest way to improve public confidence in immunisation while support those damaged by vaccine so the rest of the community reap the benefits of immunisation;

Use the best available electronic technology to monitor the cold-chain in the field and implement audits on vaccine wastage. Savings which can be made should be reinvested into other parts of the system;

Practice visits and local immunisation coordinators who are technically competent are two of the most effective strategies to increase knowledge and communicate with doctors so they can be kept up to date with immunisation (regardless of expense).

## 6.2 CONCLUSION

The aim of any Immunisation Program is the control and/or elimination of certain vaccine-preventable diseases through sustained, high levels of vaccine uptake in target populations. This goal must be reached through high quality, sustainable service delivery systems. Vaccinating someone is more than just giving an injection.

For most health professionals involved in immunisation, vaccinating a person is often seen as merely the clinical act of injecting a vaccine. But it is much more than that. We must be aware that we are participating in a global and national initiative that requires a sustained, consistent approach aimed at the entire population of the globe. We are therefore the interface between individual clinical intervention and a vast public health initiative which is aimed at global control and eradication of disease. But how we carry out our practice within our part of the immunisation program is crucial. We must provide high quality immunisation service delivery at every level of

the system to ensure we do not bring into disrepute our own area of practice. And, poor practice also reflects on the whole immunisation program.

Without this closer attention to detail we really do not have an effective immunisation program. While Australia has implemented a wide range of new immunisation strategies since 1996, we can still learn from overseas best-practice immunisation models.

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## 7. RECOMMENDATIONS

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### 7.1 IMPLICATIONS OF THE BEST-PRACTICE MODELS FROM OVERSEAS AND THEIR IMPLICATION FOR AUSTRALIA AND/OR SOUTH AUSTRALIA

A number of improvements could be made to increase the quality and vaccine uptake in Australia and SA. Some of these recommendations have already been put into place in South Australia in particular. It is unrealistic to expect all the lessons I have learned should be adopted for Australia so I have only listed those recommendations that I think could realistically be implemented in Australia. I recommend the following changes or improvements for relevant immunisation programs:

- Current and future funding agreements between the Commonwealth and states/territories, and between State and local authorities or service providers, could include targets and performance data on some of the other core components of immunisation program described in Part 5 of this report. This is done within SA when immunisation programs are funded by the Department of Human Services. In addition, funding should only be forthcoming if the agreed targets are met.
- Each state and territory must have a practical strategy to ensure overdue children are vaccinated. The current program, based on the Australian Childhood Immunisation Register will help us to get our vaccination levels to around 90%. However, an additional strategy is needed to move the vaccination levels from 90% to nearly 100%, and no amount of financial incentives or reminder letters will do this. Overseas experience over many years has demonstrated that the only way to ensure that this last 10% of the population (usually high risk children) get vaccinated is to find them physically and offer vaccination on-the-spot (often at home). In other words the service must go to the children. Those states with maternal and child health services are well placed to implement this. Data from the Australian Childhood Immunisation Register could be used to formulate lists of children by postcode and these lists given to the appropriate service provider to ensure the children are followed up and vaccinated. No amount of financial incentives have been shown to be effective in ensuring high risk populations (who are usually overdue) are vaccinated on time. Maternal and child health organisations, like Child and Youth Health in SA, are already well placed to implement this strategy. All stakeholders should agree on the definition of 'overdue' but a criterion is those children who are 3 months or more overdue for their required vaccines. I am working towards this goal at the moment in SA.
- Australia already has a system of national negotiated prices for vaccines and all the states purchase their supplies on the basis of this price. This system should continue. All states should deliver all free vaccines to the door. All deliveries should have standard cold chain monitoring devices. In addition there is a need to implement vaccine wastage surveys throughout our program. These strategies are already in place in SA and Queensland and have

been shown to save those states money. Some of these savings have then be reinvested into the program to improve program quality.

- Australia already has the best model of a national vaccine register and feedback to general practitioners. However, the system of feedback and use of the data from the Australian Childhood Immunisation Register needs to be better implemented for public sector vaccine providers. Parents need to be encouraged to use the register more. I am hopeful that these improvements will follow after the completion of the current evaluation of the ACIR (in process at the time of writing).
- Australia needs to improve the current national reporting system of adverse events following immunisation and parents should also be encouraged to report conditions. Improvements to the national reporting of adverse events should be implemented across Australia fairly soon. Special immunisation services for children who have had previous adverse events should be implemented in all states based on the SA model. SA already has the best passive system of adverse events surveillance and we are about to pilot an active surveillance system based on the US model. Active systems of adverse event reporting must be made a priority to ensure we can find new and previously unknown types of medical conditions that may be related to vaccination. This is an essential component of vaccine safety and should be seen as a sign of a mature immunisation program.
- We need to ensure community education programs are sustainable rather than implemented in an ad hoc way. Regular yearly market research on consumers' and vaccine providers' knowledge and attitudes to immunisation should underpin all our education activities. This means sustainable funding regardless of the life of any particular government. Much has improved in this area since 1993 but we seem to be still seduced into mass media campaigns rather than more effective education strategies that are focussed on vaccine providers. The imminent publication of the *National Guidelines on Immunisation Education for Nurses and Midwives* will greatly assist educators to provide a consistent immunisation curriculum across Australia. We should be proud of our parent publications and our websites. Improved strategies of risk communication should be implemented as separate feature of the education of the community and health professionals. This would need to be done at a national and state level.
- Australia should reconsider the idea of implementing a system of no-fault compensation for vaccine-related injury. This problem of vaccine injury will increasingly become a problem for our government and will be threat to the immunisation program, as we get closer to the target of 100% vaccine uptake. At that stage of maturity of our national vaccination program, we will see almost no damage from the diseases but perversely we will experience only vaccine-related medical conditions (even though these will be very rare). Those four states that have not implemented legislation that requires immunisation records to be lodged prior to children enrolling into child care centre and school, need to follow the rest of the states in Australia.
- Local management systems should be enhanced to improve the links between vaccine providers and the state and national organisations that are jointly responsible for immunisation. Some states are poorly resourced in terms of state immunisation units. This also needs to be addressed to improve the vertical and horizontal coordination between the national and state and local components of our highly fragmented immunisation service delivery systems. The model of Local Immunisation Coordinators based in Divisions of General Practice has been demonstrated to be an effective means for improving vaccine uptake and the quality of the service in SA. This should be seen as a priority in other states. Funding should be committed from the Commonwealth government through the Divisions of General Practice for this purpose. Those responsible for immunisation management throughout the three different levels

of the program, should commit to regular mapping of their immunisation system so the appropriate infrastructure can be built and maintained that meets the needs of the population.

- The current system of financial incentives for general practice is a very expensive way to encourage primary health care providers to maintain the immunisation levels within the population. Less expensive normative incentives using professional strategies could be used to motivate vaccine-providers to improve vaccine uptake and the quality of service delivery. Financial incentives, if used, should be practice-based rather than aimed at individual practitioners. If financial incentives are to be used in future, they must be seriously tied to performance and outcomes and other requirements (eg practice computerisation).

## **7.2 HOW THIS KNOWLEDGE IS BEING DISSEMINATED AND HOW THE LESSONS LEARNED ARE BEING IMPLEMENTED**

I have been working to implement many these changes nationally and in SA. In many cases the study tour confirmed that projects I have already started in SA are in line with international best practice in terms of program management. I am able to do this in my position of the SA Immunisation Coordinator with the Department of Human Services. Most of the immunisation projects I have instigated in SA are in some way linked to the findings from my Churchill Study Tour.

In SA we already have increased immunisation infrastructure including the new Local Immunisation Coordinator positions which are the first of their kind in Australia. SA now has the highest proportion of fully immunised children in the 18 month age-group (an increase of 25% since 1995).

I have strengthened those horizontal and vertical links for which I am responsible within the SA Immunisation Program. This is part of my current role as the SA Immunisation Coordinator.

I have given a number of conference papers here and in New Zealand since my return to describe the lessons learned and advocate change.

I continue to work, in my position as the SA representative on the National Immunisation Committee, to implement many of the recommendations I have listed above including advocacy for more consistency between states in their approach to immunisation.

As a member of the Australian Technical Advisory Committee on Immunisation I am in a position to influence the clinical guidelines for immunisation to reflect developments overseas that are relevant for Australia.

I am a member of the Public Health Association National Immunisation Conference organising committee. The next national immunisation conference will take place next year. Some of the international guest speakers are to be invited on the basis of my exposure to them during my study tour. I plan to present a number of conference papers to explain the most important aspects of my Churchill Fellowship study tour. This conference usually attracts a wide audience through the media and the conference recommendations will be sent to the federal and state Ministers of Health.

I plan to write a number of journal articles based on the knowledge and experience I have gained from the Fellowship.

Finally I plan to send a copy of this report to federal and state Ministers of Health in the hope it may directly influence future health planning on immunisation issues for Australia in general and for SA in particular.

*“I am certainly not one of those who need to be prodded. In fact, if anything, I am a prod.”*

(Winston Churchill, 11 November 1942)

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