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REPORT

**WHO/UNICEF WORKSHOP ON THE EXPANDED PROGRAMME
ON IMMUNIZATION AND CONTROL OF VACCINE-PREVENTABLE
DISEASES IN THE PACIFIC ISLAND COUNTRIES AND AREAS**

**Nadi, Fiji
2-6 April 2001**

Manila, Philippines
July 2001

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**WHO/UNICEF WORKSHOP ON THE EXPANDED PROGRAMME
ON IMMUNIZATION AND CONTROL OF VACCINE-PREVENTABLE
DISEASES IN THE PACIFIC ISLAND COUNTRIES AND AREAS**

Convened by:

REGIONAL OFFICE FOR THE WESTERN PACIFIC
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NOTE

The views expressed in this report are those of the participants of the WHO-UNICEF Workshop on the Expanded Programme on Immunization and Control of Vaccine-Preventable Diseases in the Pacific Island Countries and Areas and do not necessarily reflect the policies of the World Health Organization.

This report has been printed by the Regional Office for the Western Pacific of the World Health Organization for governments of Member States in the Region and for the participants in the WHO-UNICEF Workshop on the Expanded Programme on Immunization and Control of Vaccine-Preventable Diseases in the Pacific Island Countries and Areas, which was held in Nadi, Fiji, from 2 to 6 April 2001.

SUMMARY

A WHO/UNICEF Workshop on the Expanded Programme on Immunization (EPI) and Control of Vaccine-Preventable Disease in the Pacific Island Countries and Areas was held in Nadi, Fiji, from 2 to 6 April 2001. Seventeen Pacific island countries and areas sent national representatives to the workshop.

The workshop reviewed progress made since the last workshop in October 1999 on a wide range of EPI issues including maintaining AFP surveillance, introduction of new vaccines, measles and hepatitis B control, safety of injections and vaccine use and supply.

During the workshop, participants discussed ways to maintain the quality of acute flaccid paralysis (AFP) surveillance while expanding the number of reporting sites to improve surveillance for measles and rubella. Emphasis was placed on writing and adopting national EPI Plans of Action for 2001 – 2002, on making the start of the "Strengthening EPI in Pacific Countries" a success and on the appropriate and timely introduction of *Hemophilus influenzae* type B vaccine.

EPI is a well-established programme throughout the Pacific island countries and areas, and high EPI coverage has been maintained for years. It is expected that 13 of the Pacific island countries and areas will conduct national measles follow up campaigns in the coming year, further progress will be made in safety of injections and that routine immunization services and funding will continue to improve.

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1. INTRODUCTION

1.1 Objectives

The objectives of the workshop were:

- (1) to review operational issues in Expanded Programme on Immunization (EPI) in Pacific island countries and areas with particular emphasis on progress of hepatitis B immunization, safe injection practices and cold chain and logistics management;
- (2) to discuss inclusion of new vaccines into EPI and brief on a new tool for assessment of Hib disease burden;
- (3) to review progress in measles control and provide guidelines for intensified control of measles in Pacific island countries and areas; and
- (4) to review the surveillance for and response to vaccine preventable diseases.

1.2 Organization

The WHO/UNICEF Workshop on the Expanded Programme on Immunization and Control of Vaccine Preventable Diseases in Pacific Island Countries and Areas was convened in Nadi, Fiji from 2 to 6 April 2001. Seventeen countries and areas of the Pacific islands sent national representatives. In addition, observers from the Australian Agency for International Development (AusAID), the Pacific Island Health Officers Association (PIHOA), the Secretariat of the Pacific Community (SPC) and Secretariat members from WHO and UNICEF were in attendance.

1.3 Opening ceremony

The participants were welcomed to Fiji and to the workshop by Mr Luke Rokovada, the Permanent Secretary for Health, Fiji. Opening remarks were given by Ms Nancy Terreri, UNICEF Pacific Representative and by Dr Michael O'Leary, speaking for Dr Shichuo Li, WHO Representative in the South Pacific. The opening speakers acknowledged the success of the Expanded Programme on Immunization in controlling vaccine preventable diseases. In the Pacific this includes certifying poliomyelitis-free status (together with the rest of the Western Pacific Region on 29 October 2000), interrupting the transmission of measles virus for more than three years, achieving universal hepatitis B vaccine coverage, and maintaining other vaccine preventable diseases at a low level. The speakers highlighted the continuing contributions of immunization programme staff throughout the Pacific in achieving the successes of recent years. Participants were challenged to sustain and expand the success of the EPI programme, with careful planning accompanied by commitment of resources to ensure safe and effective vaccines for all children in the Pacific.

2. PROCEEDINGS

2.1 Overview of EPI: Western Pacific Region

2.1.1 Background

EPI in Western Pacific Region commenced in the early 1980s. The six antigens were BCG, polio, measles, diphtheria, pertussis and tetanus. The targets were infants and pregnant women and the focus was on achieving high immunization coverage. From 1992, importance was attached to aggressive disease control, elimination and eradication, particularly in the eradication of poliomyelitis, and disease surveillance was used as the evaluation tool. In recent years, EPI has changed into the national immunization programme in many countries with the introduction of new vaccines, a broader focus and strong disease control component.

In late 1999, the Global Alliance for Vaccine and Immunization (GAVI) was established. GAVI is not an organization, but an alliance of all the partners involved in immunization. The partners created the Global Fund for Children's Vaccines to fund poorer countries with annual per capital income less than US\$ 1000. The fund currently supports activities to improve immunization services, if DPT3 coverage was less than 80%, and to introduce new or under used vaccines, if DPT3 coverage was higher than 50%. Countries in WPR currently eligible to apply for GAVI funds are Cambodia, China, Lao People's Democratic Republic, Mongolia, Papua New Guinea, the Solomon Islands and Viet Nam.

2.1.2 Immunization services

The Joint Strategic Plan on EPI, 2000-2004 was developed and distributed by WPRO/WHO and EAPRO/UNICEF Regional Office for East Asia and Pacific. The overall objectives are (1) to eradicate, eliminate, or control vaccine preventable diseases; (2) to strengthen and sustain national immunization programmes and improve quality of immunization services; and (3) to expand immunization services to include new antigens and interventions and new ways of delivering immunizations.

WPR countries largely maintained EPI coverage at a high level - over 80%; however, some countries had low coverage and some countries faced problems in sustaining high EPI coverage.

2.1.3 Major strategies post polio-free certification

On 29 October 2000, the Regional Commission for Certification of Poliomyelitis Eradication in the Western Pacific concluded in Kyoto, Japan, after thorough review of national and sub-national documentations that the transmission of indigenous wild poliovirus had been interrupted in all countries and areas of the Western Pacific Region and therefore the Region was certified polio free.

2.1.4 Immunization

Full scale National Immunization Days are no longer recommended. However, sub-national immunization days should continue in some circumstances and routine immunization should be improved.

2.1.5 Response to importation of wild poliovirus

The response to a single imported case of wild poliovirus with limited or moderate spread should be two rounds of high risk response immunization with OPV in an area equivalent to at least one province. If there is evidence of secondary poliomyelitis cases resulting in extensive local transmission (i.e. re-establishment of transmission of wild poliovirus), the response should include sub-national immunization days or national immunization days.

2.1.6 AFP surveillance

All AFP cases without adequate stools must continue to be followed up at 60 days. All cases where poliovirus has been isolated must also continue to be followed up at 60 days. Depending on local circumstances, countries may cease 60-day follow-up for AFP cases with two adequate stools that have both tested negative for poliovirus.

All other surveillance standards should be maintained at certification levels as recommended by the Regional Certification Commission.

2.1.7 Laboratory containment of wild poliovirus infectious/potentially infectious materials

Activities to ensure laboratory containment of wild poliovirus infectious and potentially infectious material in laboratories must be continued. Adequate systems of identification of laboratories and samples must be maintained.

Every country should complete the inventory of laboratories, which may hold wild poliovirus infectious or potentially infectious materials and should start the inventories of wild poliovirus infectious and potentially infectious material. Laboratories using wild poliovirus for teaching purposes should cease doing so.

2.1.8 Accelerated measles control

[See Section 12.]

2.1.9 Maternal and neonatal tetanus elimination:

Since 1989, when the World Health Assembly called for the elimination of neonatal tetanus (NT), 104 of 161 developing countries have achieved the elimination target, which is defined as less than 1 NT case / 1000 live births in every district by 2000. However, NT continues to be a significant problem in the remaining 57 countries. WHO, UNICEF and UNFPA in December 1999 reaffirmed the elimination target and set the year 2005 as the target date for world-wide elimination.

Six countries in both the WHO Western Pacific Region/UNICEF EAPRO have not yet achieved elimination target, these are Cambodia, China, Lao People's Democratic Republic, Papua New Guinea, Philippines and Vietnam.

The major strategies in the Regional Plan of Action for MNT elimination include: effective NT surveillance that should be integrated with existing active surveillance system for AFP and measles; conduct supplementary immunization activities for child bearing age women; maintaining MNT elimination by strengthening routine immunization to achieve a coverage of 90% for at least two doses of TT and promoting clean delivery and cord dressing practices.

2.2 Other activities

2.1.1 Progress made in the introduction of hepatitis B vaccine

Cambodia and Lao People's Democratic Republic, the only two countries that have not yet introduced hepatitis B vaccine, will begin introduction of HepB + DPT by the end of 2001 in the phased manner with support of GAVI and Global Fund for Children's Vaccines (GFCV). The coverage rate of hepatitis B immunization is improving and medium-term vaccine supply is more secure for most countries. However, much remains to be done for secure long-term vaccine supply and to improve coverage in larger countries, mainly China, Philippines and Viet Nam.

2.1.2 Safe immunization.

Great efforts have been made in safety of immunization in this Region and remarkable progresses have been achieved. National policies and plans of action for injection safety have been developed in Cambodia, Fiji, Lao People's Democratic Republic, Mongolia, Papua New Guinea, Philippines and Viet Nam. A national committee for safety of injection has also been organized in some of these countries. AD syringes and safety boxes were used for measles campaigns in Cambodia, Lao People's Democratic Republic and various Pacific island countries (PICs). In addition, a system for reporting and investigation of adverse events following immunization was given more attention while immunization campaigns were conducted.

2.3 Conclusions

Immunization programmes in countries in the Region have been successful over the last decades and the achievements have been largely maintained. Certification of polio free status was the latest achievement. Issues do remain concerning sustainability and improvement of quality. Programmes are generally in a phase of aggressive disease control, elimination and eradication and expansion to introduce new vaccines.

3. COUNTRY PRESENTATIONS

A total of 17 countries presented their country report. The country presentations reported the following areas:

- (1) immunization coverage from 1996 to 2000;
- (1) reported cases of EPI disease, 1996 to 2000; and
- (3) significant accomplishments or innovations and important constraints, challenges/problems in the EPI programme.

3.1 Immunization coverage

Some countries presented national coverage data as well as disaggregated data by provinces or districts. In a few countries national level data are yet to be compiled.

3.2 Achievements

The countries and areas' achievements since the last EPI meeting in 1999 are summarized as follows: (i) hepatitis B is given in the delivery room in the almost all national hospitals and health centres. (ii) establishment of a permanent immunization unit in Tonga; (iii) partnerships with private hospitals and private clinics about recording and reporting of immunization data is well established; (iv) staff were trained on integrated delivery of childcare services in Vanuatu, Federated States of Micronesia and Kiribati; (v) coverage surveys were conducted in many countries; (vi) development of IEC materials proceeded; (vii) curriculum development advanced; (viii) need assessments of cold chain management systems and training of staff were conducted in many countries; (ix) EPI is now included in the national plan (corporate plan) in many countries; (x) success in introducing Hib (DPT+, Hib/Tetra Hib) (xi) National Survey Research on EPI carried out in Fiji; and (xii) introduction of policy and service delivery on autodestruct syringes/safety boxes in Fiji.

3.3 Challenges/Problems

The challenges and problems reported by the countries are summarized as follows: (i) sustaining high coverage of immunization; (ii) strengthening and improving the recording and reporting systems in health both in the public and private sectors; (iii) fast turn-over and shortage of staff, (iv) transportation problems affecting mobilization and supervision; (v) delivering immunization services to outlying islands and other hard to reach areas; (vi) the challenge of introducing new vaccines; (vii) lack of steady, reliable financial commitment from government; (viii) unreliable vaccine supply and difficulties in managing vaccine stocks and logistics; (ix) maintenance and repair of cold chain equipment; (x) reliability of data due to problems with newly computerised data collection and management systems; (xi) shortages of vaccine ; (xii) motivation of staff; (xiii) expense of single vial vaccines; (xiv) coordination among government officers at different levels; (xv) ethnic tension caused by political instability in the Solomon Islands; (xvi) sharps disposal, because there is no proper incinerator; and (xvii) unexpected changes in AFP reporting clinicians, resulting in poorer reporting.

4. ADDING NEW VACCINES

4.1 The Global Alliance for Vaccines and Immunization (GAVI)

GAVI is a new alliance of traditional and new partners that aims to reinvigorate immunization programmes globally. The partners have common strategic objectives and mission based on a shared situation analysis:

- stagnation/decline of immunization coverage, and regional discrepancies;
- lack of introduction of newly-developed vaccines into poorer developing countries; and
- limited investment in vaccine research for diseases with a high burden in developing countries.

GAVI's mission statement is "To save children's lives and protect people's health through the widespread use of vaccines with a particular emphasis on developing countries". The strategic objectives are to:

- improve access to sustainable immunization services;
- expand use of all existing cost-effective vaccines;
- accelerate introduction of new vaccines;
- accelerate vaccine research and development for diseases of particular importance to developing countries, (HIV/AIDS, malaria and TB); and
- make immunization coverage a centrepiece in the design and assessment of international development efforts.

GAVI was formed in late 1999, and in January 2000 the partners created the Global Fund for Children's Vaccines (Fund) to fund poorer countries (with an annual per capita income of less than US\$1000). The fund has three sub-accounts:

- to improve immunization services (if DTP3 coverage <80%);
- to introduce 'new' vaccines (if DTP coverage >50%); and
- to accelerate development of new vaccines needed for developing countries.

The new vaccines currently supported are hepatitis B, *Hemophilus influenzae* type b (Hib) and yellow fever. The third sub-account is not operational yet.

To apply for Fund support, a country must have:

- recent comprehensive assessment of the immunization programme;
- multi-year strategic plan; and
- a functioning Interagency Coordinating Committee (ICC).

4.2 Assessing new vaccines

Many new vaccines are available now and even more will be in the future. A framework for National Immunization Plans (NIPs) to assess the decision has been developed by WPRO and is published in a booklet¹. The framework is based on a set of questions, with accompanying advice:

- (1) Is the disease a public health problem?
- (2) Is immunization the best control strategy for this disease?
- (3) Is the immunization programme working well enough to add a vaccine?

¹ *Assessing New Vaccines for National Immunization Programmes: A framework to assist decision makers*. Manila, World Health Organization, 2000 (Immunization Focus, Regional Office for the Western Pacific). ISBN 92-9061-1545.

URL/Website: http://www.wpro.who.int/Public/publication/pub_view.asp?id=253

- (4) What will be the net impact of the vaccine?
- (5) Is the vaccine a good investment?
- (6) How will the vaccine be funded?
- (7) How will the addition of the new vaccine be implemented?

Working through the questions will help the decision-making about a new vaccine. But the decision to add a new vaccine to an immunization programme is often influenced by social values, perceptions, and political concerns and is not just a technical one.

4.3 Haemophilus influenzae type b (Hib)

Globally, Hib disease is estimated to cause about 400 000 deaths per year from pneumonia and meningitis in children under five years of age. The major barriers to introducing Hib vaccine are its cost and uncertainty about disease burden. This is because measuring Hib meningitis requires adequate bacteriological laboratory capacity, as well as receipt of specimens before antibiotic administration. For Hib pneumonia, it is not possible to determine the fraction caused by Hib, even with bacteriology. Vaccine studies in the Gambia and Chile have shown that 20% of severe pneumonias were prevented by Hib vaccine. The vaccine also reduced Hib meningitis by over 95%.

There is a protocol for rapidly assessing Hib disease burden based on two methods. The first needs a well-functioning laboratory and well-defined catchment area. This method uses the Hib meningitis incidence to estimate the burden of Hib disease. The case fatality rate is estimated from review of the local data. The second method calculates backwards from the under-five acute respiratory infection mortality data. Using the two methods together is likely to produce an upper and lower estimate of the total burden of the disease.

5. THE CONTROL OF HEPATITIS B INFECTION IN PACIFIC ISLAND COUNTRIES: A PROGRESS REPORT ON THE HEPATITIS B CONTROL PROJECT, JANUARY TO DECEMBER 2000

The Hepatitis B Control Project concluded in October 2000. Major advances in the control of hepatitis B were made in the Pacific island countries (Cook Islands, Fiji, Kiribati, Niue, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu and Vanuatu which received vaccines, and the Federated States of Micronesia, Republic of Marshall Islands and Palau which did not receive hepatitis B vaccines, but received technical support) during the project. The participating countries fund fully the purchase of hepatitis B vaccine from 2001 and have added hepatitis B to the national routine immunization schedules. In addition, the project has promoted successfully the delivery of all routine EPI immunizations. This progress has been achieved in part because of the commitment of the sponsors of the project; the governments of PICs, Australia and New Zealand, and UNICEF, WHO and other agencies.

The Hepatitis B Project created a platform for a new project to be developed: "Strengthening the Expanded Programme on Immunization in Pacific Island Countries". This

new project intends to build on the success of the Hepatitis B Project and endeavours to broaden the impact of EPI in Pacific island countries. Areas that will be focused on include:

- early delivery of hepatitis B first dose and high coverage with three doses;
- development of strategies for reaching the outreached;
- calculation of vaccine requirements and management of vaccine stores to avoid unnecessary wastage and shortages;
- including hepatitis B vaccine programmes in national budgets;
- implementation of the multi-dose vial policy;
- continuation of efforts to improve the cold chain;
- continuation of efforts to improve communication within EPI programmes; and
- strengthening safe injection practices and disposal of sharps.

6. COMMUNICATION AND TRAINING (COUNTRY EXPERIENCE)

6.1 Integrated training

6.1.2 Training of Dispensary Assistants and other health staff in Chuuk, Federated States of Micronesia

Chuuk is one of the four states of the Federated States of Micronesia consisting of a 43-mile lagoon with 98 islands. There are approximately 100 Dispensary Assistants in Chuuk providing primary health care services in the outer islands; however, their potential was not fully utilized, because of a lack of skills and knowledge on case management, shortages of basic drugs, supplies and equipment, and lack of supervision. To remedy this situation, three training courses were conducted with the support of UNICEF Pacific Office in Chuuk in October 1999, December 1999 and February 2000, in which a total of 94 health staff were trained. The objectives of the trainings were:

- to improve and expand the number of services offered by Dispensary Assistants; and
- to improve the knowledge, skills and decision-making abilities of the Dispensary Assistants in the execution of their duties and responsibilities.

Following the training, Dispensary Assistants demonstrated significant improvement in the management of childhood illnesses, mainly diarrhoeal diseases, respiratory infections and malnutrition. This experience shows that health staff at all levels have the potential to improve primary health care services in the islands. In order to maximize the gain from this experience, the plan is to:

- review responsibilities and job description of Dispensary Assistants and other health staff, and develop a comprehensive plan to strengthen the dispensaries in the outer islands;

- evaluate the effectiveness of the training;
- conduct refresher training to selected health staff on pre-natal and post-natal care to identify and immediately refer high risk mothers;
- develop further training courses on immunization for Dispensary Assistants and other health staff; and
- assess the needs and existing practices of the Traditional Birth Attendants (TBAs).

6.1.2 Capacity building training in Kiribati

UNICEF Pacific assisted the Ministry of Health (MOH) in capacity building training, which was conducted in five districts in Kiribati. A total of 168 health staff, consisting of Public Health Principal Nursing Officers, Medical Assistants, Public Health Nursing Officers, Nursing Aides, and Village Health Workers were trained on integrated training package on CDD/ARI/EPI. The objectives of the training were to:

- impart training skills to Public Health Principal Nursing Officers (PHPNOs) and the Medical Assistants (MA) from South Tarawa;
- upgrade the knowledge and skills of Medical Assistants on technical issues related to EPI/CDD/ARI, maternal health, supervision, and monitoring and planning;
- upgrade the skills and knowledge of Public Health Nurses on technical issues related to EPI/CDD/ARI, maternal health and community mobilization;
- impart skills and knowledge to Nursing Aides on primary health care and the disease recording and reporting system; and
- impart skills and knowledge to Village Welfare Groups (VWG) on primary health care with emphasis on home case management on diarrhoea and ARI cases, and hygiene and sanitation.

There was a significant improvement in the skills and knowledge of health workers in the management of childhood illnesses, especially diarrhoeal cases, as measured by comparing the results of pre and post-testing. The availability of safe drinking water, the need to improve personal hygiene and environmental sanitation were recognized to be the key components in overcoming diarrhea and ARI problems.

Future plans include the following: (i) conducting the training in other districts and islands; (ii) training supervisors on monitoring and supervision skills; (iii) assessing the needs and capacity of traditional health providers at the community level; and (iv) regular monitoring and supervision of the training.

6.2 IEC development and strategies

6.2.1 Developing health education strategies for the Expanded Programme of Immunization in Vanuatu

In Vanuatu, the lack of appropriate IEC advocacy materials was recognized as a major constraint in raising peoples' awareness about immunization activities. In February 2000, a needs assessment of health education materials on EPI and hepatitis B in Vanuatu was carried out in collaboration with in-country counterparts with the following objectives:

- to assess in-country needs for health education materials to raise public awareness of EPI and hepatitis B; and
- to develop health education materials about the importance of vaccinating children fully.

The key findings of the needs assessment were:

- There is a noticeable lack of IEC materials on immunization in Vanuatu.
- Most mothers have a very limited understanding of immunization.
- Hard to reach communities in particular need more health education.
- Women need to be more empowered and motivated in their roles as health educators.
- Many nurses and midwives are unaware that the first hepatitis B dose should be given within 24 hours of birth.
- A variety of educational strategies are needed to inform, educate and promote EPI.

6.2.2 IEC & training materials on immunization/ hepatitis B in Fiji and Kiribati

In 1999, a project on IEC advocacy material production was carried out by the Fiji National Centre for Health Promotion in Kiribati and Fiji. The objectives of the project were:

- to develop health education materials about the importance of vaccinating children fully; and
- to develop in-service training materials for health workers on immunization and hepatitis B.

The key findings of the needs assessment were:

- Needs analysis: It is crucial to conduct the needs analysis to identify people's perceptions, knowledge gaps and barriers that health education could ameliorate.
- Target group: It is important to identify and define the different target groups, because each has different needs and may require different communication media.
- It is important to pre-test the materials to assess their effectiveness.
- Consultants working on this issue should learn the local language.

7. SAFE IMMUNIZATION

7.1 Regional update

Immunization safety is comprised of three major components: (1) injection safety, (2) adverse events following immunization (AEFIs) monitoring and response, and (3) vaccine quality control and strengthening national regulatory authorities (NRAs). In the Region, an increasing number of routine immunizations are being delivered with disposable syringes and

there are more immunization campaigns using injectable vaccines (measles, tetanus), all using disposable syringes. There has been a concomitant increase in the use of safety boxes. In addition, more and more immunizations are being delivered by private practitioners.

The regional plan for safe immunizations takes these trends into account and has the following three major objectives:

- To ensure safe injection practices for immunizations in all countries of the region by 2002.
- To improve general injection practices, including disposal of used injection equipment.
- To explore alternative strategies of delivering injections and disposing and destroying used injection equipment.

Progress is being made in countries of the Region in all three aspects of immunization safety and towards attaining the three regional goals. Despite this, much work remains to ensure the safety of all immunizations. Critical remaining problems include having all immunization workers recognize the vital importance of immunization safety and know how to ensure safe immunizations, the inadequate production capacity for AD syringes, insufficient funds for incinerators, and stronger and more independent national regulatory authorities.

7.2 Country presentation (Fiji) on injection safety and adverse events following immunization

Fiji presented their experiences with disposal of used single use syringes in plastic safety boxes and their subsequent burning. Old concrete incinerators were problematic while new metal incinerators were better. Pit burning is done in areas not served by an incinerator. Fiji has an adverse event following immunization-reporting system; events are reported immediately to a paediatrician by telephone. However, no major AEFIs had been reported in the last 10 years. Even during periods of enhanced surveillance for AEFIs during the introduction of Hib vaccine in 1994/1995, and during a pilot study of DPT-Hib in 1999/2000 no serious AEFIs were noted.

Fiji identified four major constraints to safe injections: (1) training of personnel to use AD syringes properly, (2) the shortage of plastic safety boxes and their reuse, (3) old and inefficient incinerators, and (4) malfunctioning refrigerators.

7.3 Adverse events following immunization

Vaccines used in national immunization programmes are extremely safe and effective. But no vaccine is perfectly safe and immunization can cause adverse events. As vaccine preventable diseases become less visible through effective immunization programmes, more attention will be given to such events.

An adverse event following immunization (AEFI) is any adverse event that follows immunization that could be caused by the immunization. Immunization can cause adverse events from the inherent properties of the vaccine (vaccine reaction), or some error in the immunization process (programme error). The event may be unrelated to the immunization, but have a temporal association (coincidental event). Anxiety-related reactions can arise from the fear or pain of the injection rather than the vaccine.

Establishing a system for AEFI surveillance needs a wide range of people working together to detect, report, investigate and respond to AEFI. It is a challenging task that requires

enthusiasm and resources. Each country needs to determine its relative priority, compared with developing other aspects of the programme. However, every country needs the ability to effectively respond to immunization safety concerns. It is likely to become increasingly important for programme management (to detect and correct programme errors) and advocacy (to emphasize vaccine safety) issues.

Most countries reported on the absence of negative experiences with adverse events following immunization (AEFI). Despite this, however, there was general interest in being kept abreast of developments in this areas and would like to take part in training opportunities to be prepared to respond to/deal with such occurrences.

7.4 Safe injection

Safe injection is comprised of three major components –the development of national safe injection plans and policies, use of auto-disable syringes and safety boxes, and proper disposal of syringes. Many countries in the Region have developed a national safe injection plan of action already. Auto-disable syringes are used exclusively in all WHO/UNICEF funded measles campaigns as well as in most other campaigns. The use of AD syringes in routine immunization programmes is currently limited by their relatively limited production, but as supply increases, more routine immunizations will utilize AD syringes. Proper disposal, including incineration, is the most difficult, controversial and expensive issue related to safe injection. Progress has been steady but slow, with safe, affordable incinerators only now being introduced.

Incineration via the SICIM, Vulcan, or the DeMonfort incinerators is highly effective in the destruction of used syringes. This is the only feasible alternative for disposing of used syringes that guarantees they will cause no harm after use. If incinerators are not installed, syringes may be burned in the highly environmental unacceptable form of pit burning or they may just be discarded without any treatment.

If needles are just discarded, this will in all likelihood result in increased disease burden of hepatitis B, hepatitis C and HIV. This has occurred in the past and cannot be permitted to continue.

The WHO/UNICEF Immunization Safety Priority Project (ISPP) offers new opportunities for information sharing on experiences and developments in this area. Copies of a quarterly newsletter being produced by this project will be circulated to the Pacific island countries and areas through the partner agencies.

7.5 Safe disposal

7.5.1 Issues

- Unsafe injection practices have been linked to the transmission of hepatitis B, hepatitis C, HIV, dengue fever and malaria. Of all the adverse effects of unsafe injections, hepatitis B and hepatitis C viruses cause the heaviest burden of disease. In many countries where hepatitis B and hepatitis C are highly endemic, unsafe injection practice accounts for a large proportion of infections. World wide it is estimated that between 8-16 million hepatitis B, 2.3-4.7 million hepatitis C infections and 80 000-160 000 HIV infections result from unsafe injections on an annual basis. Although we currently do not have specific disease burden data for countries in the Region, we believe that significant transmission of disease has and is occurring because of unsafe injection practices.

- In this connection, disposable syringes and needle need to be used for all injection practices; however, how to dispose used syringes is becoming to be greater issue. Several methods for safe disposal need to be considered for the different conditions in countries. However, no best method for safe disposal can be recommended at this moment.

7.5.2 Incineration alternatives

The current best method of destruction of syringes is incineration. WPRO organized several trials of incinerators and based on these results WPRO recommends the use of SICIM, Vulcan, and DeMonfort incinerators placed away from concentrations of people. These incinerators are recommended because they are:

- low cost;
- low maintenance, easy to operate;
- burn at approximately 900 degrees resulting in only minimal release of dioxides; and
- ash is free of any intact syringes.

8. EPI INFRASTRUCTURE

8.1 Cold chain and logistics presentation

Proper management of the cold chain requires at least a comprehensive assessment of current and future needs, a complete and up-to-date inventory and long term planning and budgeting five to ten years in advance. Funds for repairs and spare parts must be included in the budget.

Cold chain equipment listed in the Product Information Sheets (PIS) is recommended by WHO and UNICEF, because it has already been tested and approved for use in EPI. Careful consideration regarding which equipment to order is important, to ensure that appropriate equipment is obtained. Spare parts should also be ordered at the same time the equipment is ordered. Also, voltage stabilisers are needed for refrigerators in areas where voltage fluctuation is a problem. Domestic, household type refrigerators purchased locally and used for storage of vaccines should be modified with the appropriate modification kit, to ensure safety of vaccines during power outages.

A simple inventory is needed to keep track of cold chain equipment on hand, as well as maintenance, repairs, and spare parts needs. It should include location of the equipment (name of clinic), type of refrigerator or cold box, its working condition, and other relevant information.

To keep vaccines potent and effective, vaccines should be moved through the cold chain as quickly as possible, kept at temperatures of +2 to +8 degrees Celsius at health centre level, and kept at health centre level for not more than one month, when possible. Care needs to be taken to not expose the following vaccines to temperatures below zero degrees centigrade as they lose their effectiveness when frozen: hepatitis B, DPT, DT, and tetanus toxoid. Freeze Watch temperature-monitoring devices should be kept with the vaccines, particularly with hepatitis B vaccine, to ensure that appropriate storage temperatures (+2 to +8 degrees Celsius) are

maintained. However, the mainstay of vaccine temperature monitoring is twice daily checking and recording of refrigerator and cold box temperatures where vaccines are stored.

When EPI programmes in PICs were first under expansion and development in the 1980's, overheating of vaccines in the cold chain was the main problem. However, since then improved cold chain equipment for vaccine storage and transport has been supplied, and more recently there are indications that overcooling of vaccines has become a problem in some areas. This is due to improper operation of refrigerators, incorrect placement of vaccines inside the refrigerator, and inadequate temperature monitoring practices.

8.2 Country experience - Solomon Islands

UNICEF Pacific assisted the MOH in the assessment of the cold chain system in order to develop a cold chain management plan for the country. The major findings were:

- Additional equipment is needed to support the cold chain.
- A new cold room needs to be installed.
- Inventory forms should be used to keep track of vaccine stocks.
- Vaccine ordering is on experience basis; minimum and maximum levels are not maintained at some centres.
- Use of vaccine vial monitors (VVM) is rare.
- Open vial policy not widely practised.
- Daily tally sheets are not maintained and consequently vaccine wastage is not recorded.
- More supervision and training are needed for health workers involved in EPI.
- Knowledge on installation and maintenance of cold chain equipment is lacking.
- A full time cold chain technician is needed.

Training was provided for provincial managers on: calculation of vaccine requirements; operation and maintenance of refrigerators; transport and storage of cold chain equipment; correct vaccination technique; and spare parts requirements for cold chain equipment.

Recommendations and plans for future action include the following: improve overall management of cold chain infrastructure (e.g. improve spare parts supplies, coordination, staff training, planning of future needs); establish a system to maintain and repair cold chain equipment; plan vaccine stock levels at different levels of cold chain; increase frequency of tours to visit clinics for supervision and training; and establish a post for a cold chain technician.

9. ESTIMATING VACCINE REQUIREMENTS

It is important for PICs to accurately estimate their countries' vaccine requirements not only to ensure that there are enough vaccines available, but also to minimize vaccine wastage.

Some vaccine wastage will exist in all programmes. However, through planning and estimating vaccine requirements, this wastage can be minimized. Two types of wastage exist: system and point of use. It was emphasized that wastage should not be viewed as a negative outcome indicator, but rather as a useful indicator to identify potential problems with the cold chain and other programme issues.

Estimating vaccine requirements is a planning process and not just a simple calculation that occurs once a year. It is essential that the national immunization programme be involved in this process. The planning process for estimating vaccine needs requires the following components: staff training, a good data reporting system, a data monitoring system and ongoing communication. In most PICs, immunization programmes do not independently estimate vaccine requirements and basic information on vaccine stocks and use is not collected. Although vaccine use in the PICs is generally good, better control is important as more countries become self-sufficient and as new, more expensive vaccines appear on the market.

Three methods to estimate vaccine requirements were presented to participants. In particular, the formula based on target population, wastage factor and number of doses was recommended and presented to participants. The participants were then asked to complete an exercise on how to estimate vaccine wastage and requirements using this formula. Subsequent discussion highlighted the issue of collecting accurate and good quality data. It was noted that without collecting reliable data, it is difficult to accurately estimate vaccine requirements. Some participants noted that the formula was complex and that there could be problems if these calculations were left for staff members other than the national immunization programme manager to make. Participants concluded the session with an understanding of the factors that they need to consider in calculating vaccine requirements, particularly vaccine wastage.

10. COVERAGE SURVEY

In cooperation with MOH in Fiji, a standard thirty-cluster EPI coverage survey was carried out in Nadi subdivision by the workshop participants and nurses from Nadi subdivision. The nurses were full-fledged team members, as well as guides and translators. Workshop secretariat and observers also accompanied the participants during the fieldwork. Briefings were provided to workshop participants on how to prepare the survey, including selection of clusters, training of staff, conduct of the survey in the field, as well as analysis of results. Participants spent a full day in communities in Nadi subdivision doing the survey fieldwork, assessing coverage by visiting homes and checking on the immunization coverage of children in the target age group, 12 to 23 months of age. Unfortunately, heavy rain interfered with completing all of the survey during the one day allocated for the field work. Nevertheless, fourteen clusters were fully completed and another nine clusters were partially completed. A preliminary review of the partial survey results obtained indicated that prevailing immunization coverage in Nadi subdivision is high for all vaccines.

In a review session held the day following the fieldwork portion of the exercise, the following major points were made:

- The need for a clear definition as to whether or not a temporary resident of a household should be included was mentioned.
- Village protocol (courtesy) should always be observed, as was done during this survey.

- To have a map of the cluster area, as provided, is helpful.
- Surveyor/nurse should be in uniform or carry ID cards, to facilitate identification, as was done during the survey.
- A need to incorporate new vaccines (DPT – Hib) in the immunization card was identified.
- The importance of checking the immunization records in health centres and hospitals as needed was mentioned, although immunization cards were available for nearly all children encountered in the survey.

There was no problem with the questionnaire. It was easily understood by the surveyors.

11. SURVEILLANCE

11.1 Review of AFP surveillance

Hospital-based active surveillance for acute flaccid paralysis (AFP) was established in the Pacific in 1997, and now involves 58 hospitals and about 200 key paediatric clinicians. A surveillance coordinator in each hospital is responsible for ensuring that a surveillance form is completed every month documenting the absence of AFP. Should a case occur, it must be immediately investigated, and two stool specimens sent for testing for poliovirus. Over the last four years, about 90% of monthly forms have been forwarded to WHO, and 51 cases of AFP have been investigated (the population of the Pacific suggests that at least 40 cases of AFP should occur in a four-year time span).

From the outset, this system has included surveillance for suspected measles (and neonatal tetanus). Occasional “measles” cases have been reported, although the system has not been adequately tested, given the interruption of measles transmission in the Pacific since March 1998, and the apparent infrequency of other acute rash illnesses on hospital wards. Also, the investigation and response element of measles control has been generally weak. To sustain a measles elimination phase in the Pacific, case-based surveillance should be emphasized, and capacities for laboratory investigation and public health response must be ensured.

11.2 Improving measles surveillance

Measles surveillance is currently integrated into AFP surveillance; it is an active, inpatient hospital based system conducted at 58 hospitals throughout the PIC. In addition, with the establishment of LabNet in 2000, there is now the laboratory capability to assay all suspect cases of measles for anti-measles IgM.

The PICs are in the elimination phase of accelerated measles control so every suspect case of measles must be reported in a timely manner, investigated completely and be laboratory confirmed. In order to achieve this, the current system must both improve what it is doing now and expand to include outpatient and community-based sites. Any person with rash and fever and at least one of cough, conjunctivitis, or coryza meets the case definition. Of note, since measles transmission has been interrupted, all or almost all cases of suspect cases will test negative for measles. This is expected and desired.

Surveillance for measles is done to help control measles, not just data collection. The data must be analysed and used to plan immunization strategies and outbreak control responses.

11.3 Integrating surveillance

Measles and AFP surveillance need to be considered, in each country, in the context of overall notifiable disease surveillance. Surveillance systems are, in general, overburdened by data collection and reporting, and give insufficient attention to data analysis, interpretation, and public health response. To strengthen surveillance systems in a balanced manner, the Pacific Public Health Surveillance Network (PPHSN), a collaboration among governments and regional agencies and institutions, has been developing three "legs" of surveillance: disease and outbreak identification and reporting (supported by the e-mail list server, PACNET); diagnostic laboratory support (based on LabNet, a three-tiered network of public health laboratory services established in 2000); and public health response (national and regional capacity-building through the EpiNet initiative). The underlying principles of these efforts include the conviction that rational action requires good information; disease information comes from surveillance; and surveillance must be supported with resources and followed by action. The PPHSN has developed a strategy and draft plan of action, supported by the Pacific ministers and directors of health, to address these important surveillance and response issues.

12. MEASLES CONTROL

12.1 Regional overview/PIC overview

The Western Pacific Region continues to make great progress in measles control. In 1989, the World Health Assembly resolved to reduce measles morbidity by 90% and measles mortality by 95% by 1995, compared to the pre-vaccine era. In 1990, the World Summit for Children established the goal of 90% vaccination coverage for measles vaccine in 12 month olds by the year 2000. WPR achieved all these goals by 1995. However, measles is still the leading cause of death among vaccine preventable diseases in the Region.

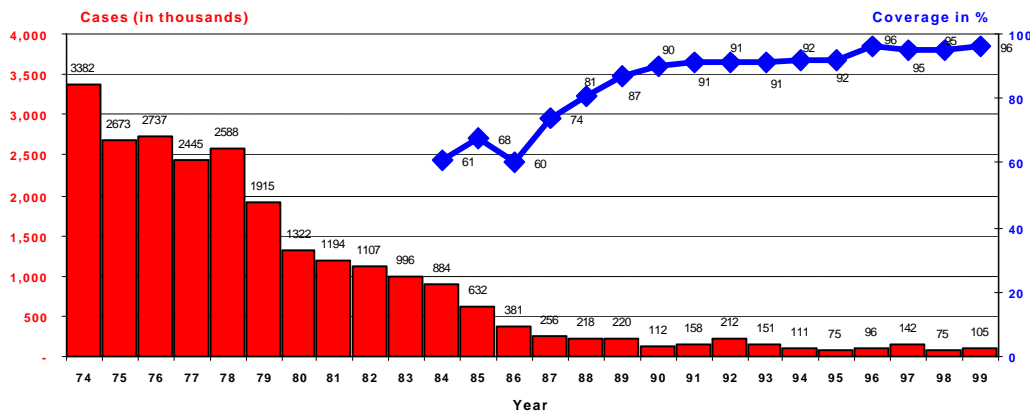
Accelerated measles control in the WPR and EAPRO of UNICEF is moving forward in all three key areas: immunization, case-based surveillance and laboratory confirmation of suspect cases. The extremely high coverage (>95%) with two doses of measles vaccine that is needed to ensure interruption of measles transmission can be achieved through routine immunization activities in a minority of countries. Most countries in the Region will require supplemental immunization campaigns. One or two countries may need to rely on routine services and immunization campaigns routinely. Measles transmission has probably already been interrupted in Mongolia and the PICs by the use of routine immunization coupled with campaigns.

A regional measles laboratory network, modelled on the polio laboratory network, is in the process of development. The Victorian Infectious Diseases Reference Laboratory in Melbourne has been designated the first regional reference laboratory and the Pacific Island Countries and Areas laboratory network was established in April 2000 with four laboratories; Fiji, French Polynesia, Guam and New Caledonia. It has been proposed that these four PIC laboratories fulfill the functions of a national measles laboratory for each and every PIC. These four PIC laboratories are to perform IgM capture or indirect assays or both for measles and rubella, and to work with the local health department staff of the PICs to develop a system that ensures the timely and proper collection, handling, transportation, testing and reporting back of results. Other national laboratories in the PIC are not expected to test for measles or rubella. National

laboratories in the other countries and areas of the Western Pacific Region are in the process of designation.

The major challenges for measles control and elimination are to obtain strong political commitment and financial support, to achieve over 95% of immunization coverage with two doses and establish highly sensitive surveillance systems and rapid outbreak responses. Safe injection and safe disposal of used syringes are also ongoing problems.

Reported Measles and Vaccine Coverage Western Pacific Region, 1974-1999



12.1.1 Measles control – Pacific overview

Indigenous transmission of measles has apparently been interrupted in the Pacific for over three years, since March 1998. Countries have reported scattered cases of “measles” since 1998, although none were laboratory-confirmed (except three cases in French Polynesia in 1999) and no outbreaks were reported in the last three years. Previously, following the widespread adoption of the EPI, from about 1982 to 1997, an average of four outbreaks occurred every year in the Pacific. In the 1970s, prior to the Pacific EPI era, many large outbreaks of measles occurred every year. The interruption of measles transmission may be the result of several factors, but likely an important one is the success of measles mass immunization campaigns in late 1997 and early 1998 in 13 Pacific island countries, targeting (in general) all children from age 9 months to 14 years, and reaching at least 86% of this population with a supplemental dose of measles vaccine. Other factors may include a reduction in population susceptibility following the seven outbreaks which occurred in late 1997; and the recent reduction in measles incidence in, and thus in the risk of introduction from surrounding countries. At previous EPI meetings participants agreed that sustaining measles-free status requires that all countries achieve either high dose (>95%) coverage with two doses of measles vaccine, or achieve high coverage with one dose, and supplement this with a mass campaign every 4 to 5 years.

12.2 Review of 1997/1998 measles campaign experiences

The 1997/1998 measles mass immunization campaigns were successfully conducted in 13 countries, with at least 86% coverage overall (more than 90% in many countries). Because of the simultaneous spread of measles across the Pacific, many of the campaigns were conducted in situations of urgency, or with limited planning. Nonetheless, most campaigns proceeded smoothly, with a positive response from the community. Lack of transportation was identified by several participants as a significant constraint to campaign success. Vaccination teams were

often hindered in reaching remote areas of islands by unavailability of vehicles, and from reaching offshore or outer islands by lack of access to boat transport. In some countries, inadequate staff training and limited availability of staff time for the campaigns were identified as additional concerns.

13. MEASLES CAMPAIGN PLANNING

This session was allocated for group exercise. The participants were asked to review the major operational elements of mass measles campaigns and addressed the objectives and the expected output of the sessions. The objectives of the group exercise were to:

- establish target dates and a target population for a measles mass immunization campaign;
- outline the major operational elements of a mass campaign;
- develop an action plan for the campaign with as much detail as possible on each element; and
- prepare an action time line leading up to the campaign, describing activities required for full preparation, and their timing.

Each group was asked to select a rapporteur. The group members were first asked to discuss in their own groups and later present the outcome of the group work to the plenary.

A total of 12 out of 16 countries indicated intentions to conduct measles mass campaigns in the next 12 months. Although target dates will be finalized later at country level, the expected range is September 2001 to April 2002. This campaign group includes two areas, which did not conduct a mass campaign in 1997/1998, or which conducted only targeted campaigns: American Samoa, and Marshall Islands. In Palau and the Marshall Islands, the target population will likely extend well beyond age four, as this would be the first mass campaign. Six countries do not expect to conduct mass campaigns in 2001/2002: Guam, Federated States of Micronesia, New Caledonia, Wallis and Futuna, and Tokelau and Palau. Each of these considers its coverage to be high enough to preclude the spread of measles, and each has knowledge of their "unreached" populations and believes it can target these zero-dose children.

All those countries intending mass campaigns reviewed the major operational elements for which detailed planning is necessary. This will start at national level, relying on senior public health staff and those involved in campaigns in 1997/1998. After decisions are made on the composition and function of teams, the recording procedures for immunizations given, and such issues as cold chain, transportation, social mobilization/ advocacy, and logistics, training of staff will take place at all levels beginning at national level. Most countries did not anticipate difficulties in making staff available for the campaigns, but did anticipate additional resource needs for transportation (fuel costs, and the hire of vehicles and boats), and cold boxes and ice packs, and some anticipated resource needs in media promotion and social mobilization, or for MMR vaccine to be used in place of measles.

Other important issues discussed included ensuring safe disposal of syringes and needles in the campaign; and focusing greater efforts in areas where zero-dose children are more likely to be found.

Detailed planning is anticipated in the mass campaign group of countries in upcoming months, with final draft plans to be ready three months before the campaign is to begin. These plans should be shared with resource and technical support agencies such as WHO and UNICEF.

14. NATIONAL EPI PLAN OF ACTION FOR 2001 – 2002

This session was allocated for group work on the aspects of the national immunization programmes that were identified on Day 1 as in need of improvement. Some countries had already developed a national plan of action for immunization focusing on areas to be improved, while other countries were still in the process of developing it. It was felt that this was an opportunity for countries to discuss relevant issues together and to individually develop further their national plans of action for immunization. Countries were informed before breaking into groups about the possible areas to be supported by the new EPI project, “*Strengthening EPI in Pacific Countries*”

The objectives of the exercise were to identify:

- activities to be carried out in 2001-2002; and
- resources required to strengthen these activities.

Countries were requested to identify activities within the following areas, as well as indicate the “*timeframe*” and “*resources required*”, for each identified activity.

- (1) National plan/policy development
- (2) Capacity building/training
- (3) Social mobilization/IEC development (e.g., needs assessment, production of materials)
- (4) Cold chain

All countries submitted a plan of action for the year 2001-2002; however, some countries preferred to further discuss the draft plans with their respective ministries.

15. CONCLUSIONS AND POINTS FOR ACTION

Haemophilus influenzae type b

- (1) The available data in the Pacific on Hib disease burden should be assessed, reviewed, and consolidated to evaluate the addition of Hib vaccine to the EPI. The assessment may use a variety of data sources and rapid assessment tools, given the difficulty of measuring Hib burden, including data on meningitis and pneumonia from Pacific countries that have introduced Hib vaccine.
- (2) Should data on disease burden be convincing, and considering other implications for introduction of new vaccines, external support should be sought for introducing in a

sustainable way routine Hib immunization in countries where Hib vaccine is not currently part of routine immunization services.

- (3) Partner agencies should explore mechanisms to ensure laboratory support in Hib diagnosis for Pacific countries.

Communications and training

- (4) Pre-service and in-service training needs of staff should be assessed and addressed. Where possible, integrated training approaches should be considered to ensure cost-effectiveness and productivity of training.
- (5) Countries should consider strengthening social mobilization efforts, and the production of IEC materials.

Injection safety

- (6) Auto-disable syringes are recommended for the EPI programme.
- (7) Countries should ensure that national EPI policies contain policy statements on safe injection. Issues of continuity of supply and of safe disposal should be addressed.

Cold chain

- (8) Countries should have cold chain management plan, including inventory, periodic replacement of cold chain equipment and spare parts, logistical management and training needs.
- (9) Country capacity in maintaining the cold chain should be strengthened through training activities.

Estimating vaccine requirements

- (10) Countries should ensure that annual estimates of vaccine requirements are calculated, and vaccine stock managed, in such a way that vaccine requests match actual use (including wastage) as closely as possible. Countries that have experienced shortages or excess of vaccines should examine more closely the causes of these, and also the current data reporting mechanism, its function, and its cost-effectiveness.

Maintaining polio-free status

- (11) Countries should maintain high quality AFP surveillance, high routine OPV/IPV coverage and preparedness for response to importation of wild poliovirus. Laboratory containment should be completed as early as possible.

Measles surveillance

- (12) Pacific countries are now in a measles elimination phase, and need sensitive case-based surveillance and immediate reporting, laboratory investigation of suspected cases, and public health action following all reports.
- (13) The major focus of measles surveillance should now shift to the reporting of acute rash plus fever, to encourage maximum sensitivity in surveillance.

- (14) The Pacific Public Health Surveillance Network should further develop the LabNet public health laboratory services network for measles diagnostic testing, and ensure that this support is available to countries.

Integrating surveillance

- (15) The Pacific Public Health Surveillance Network should pursue its strategies of strengthening surveillance, laboratory support, and public health response for outbreak-prone communicable diseases, including measles.

Measles elimination

- (16) To achieve a measles elimination target, all countries should seek to sustain the interruption of measles virus transmission in the Pacific. This requires high coverage (>95%) with two doses of measles-containing vaccine. This can be achieved with two scheduled doses. If routine coverage is not high enough or if a single dose schedule is used, mass campaigns every 4 to 5 years will be needed.
- (17) All countries not able to document high two-dose coverage (> 95% on both doses) should conduct mass campaigns in 2001 – 2002 if at all possible, or provide a convincing alternative plan to prevent indigenous transmission of measles should re-introduction occur.
- (18) Countries should further develop comprehensive plans for meeting the resource, logistical, training, and social mobilization/ advocacy needs of measles mass immunization campaigns, with operational strategies for reaching at least 95% of the immunization target population. These plans should be completed at least three months before the campaign target start date. These plans should be shared with resource and technical support agencies.
- (19) International agencies should prepare a list of measles “Frequently Asked Questions” and answers, addressing common concerns of both the community and of health care workers, and make these available to countries for local adaptation and use in measles campaigns and the routine immunization programme.

Protection through immunization for other vaccine preventable diseases

- (20) The control of other vaccine preventable diseases should be sustained through high routine EPI coverage, including sustaining the elimination of neonatal tetanus by ensuring protection at birth for all newborns.
- (21) Protocols for public health response to cases of neonatal tetanus should be developed, based on investigation of every case.

Immunization coverage

- (22) The quality of coverage data should be assured, low coverage areas assessed, and technical support sought where indicated.
- (23) Updated versions of COSAS software for use in immunization coverage surveys should be distributed as soon as available.

16. CLOSING

On behalf of UNICEF, Ms Nancy Terreri congratulated the country participants for their hard work during the week and appreciated the outcome of the group work. Dr O'Leary, on behalf of WHO, commended the contributions of all participants and recognized their determination to continue effective prevention and control of EPI diseases in the Pacific.

WORLD HEALTH
ORGANIZATION



ORGANISATION MONDIALE
DE LA SANTÉ

REGIONAL OFFICE FOR THE WESTERN PACIFIC
BUREAU RÉGIONAL DU PACIFIQUE OCCIDENTAL

**WHO/UNICEF WORKSHOP FOR THE EXPANDED
WPR/ICP/EPI(1)/2001/IB/2
EXPANDED PROGRAMME ON IMMUNIZATION
AND CONTROL OF VACCINE-PREVENTABLE
DISEASES IN PACIFIC ISLAND COUNTRIES
AND AREAS**

23 April 2001

**Nadi, Fiji
2-6 April 2001, Nahi, Fiji**

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**PROVISIONAL LIST OF PARTICIPANTS, CONSULTANTS, TEMPORARY ADVISERS,
REPRESENTATIVES/OBSERVERS AND SECRETARIAT**

1. PARTICIPANTS

AMERICAN SAMOA

Dr Angela Techur-Pedro
Maternal and Child Health Physician
Department of Health
Pago-pago
Tutuila
American Samoa
Fax No. (684) 633-5379; 7686
Tel. No. (684) 633-2263

COOK ISLANDS

Ms Ngapoko Short
Director of Public Health
Ministry of Health
P.O. Box 109
Rarotonga
Fax No. (682) 23109
Tel. No. (682) 29664

Mr Glassie Utia
Pharmacist
Ministry of Health
P.O. Box 109
Rarotonga
Fax No. (682) 23109
Tel. No. (682) 29664

FIJI

Sister Litia Cava
Assistant Director, Nursing
Ministry of Health
P.O. Box 2223
Government Buildings
Suva
Fax No. (679) 221450
Tel. No. (679) 221450

Ms Saloma Bolaqace
Pharmacist
Government Pharmacy
Ministry of Health
P.O. Box 2223
Government Buildings
Suva
Fax No. (679) 315022
Tel. No. (679) 304199

GUAM

Mr Ronald G. Balajadia
Coordinator III
Immunization Program Supervisor
Communicable Disease Control
Department of Public Health
and Social Services
P.O. Box 2816
Hagatna
Fax No. (671) 734 5910

KIRIBATI

Dr Airambata Metai
Director of Public Health
Ministry of Health
P.O. Box 268
Tarawa
Fax No. (686) 28107
Tel. No. (686) 28107

Dr Burentau Teriboriki
Medical Officer, Paediatric Unit
Ministry of Health
P.O. Box 268
Tarawa
Fax No. (686) 28152
Tel. No. (686) 28100

MARSHALL ISLANDS,
REPUBLIC OF THE

Dr Kennar Briand
Director of Public Health
Ministry of Health and Environment
Majuro
Fax No. (692) 625 3432
Tel. No. (692) 625 3432

MICRONESIA,
FEDERATED STATES OF

Mr Thomas Walog
Immunization Coordinator
Yap Hospital
Colonia, Yap FM 96943
Fax No. (691) 320 5263

NAURU

Sister Gano Mwareow
Community Health Clinic
Department of Health
Republic of Nauru
Central Pacific
Fax No. (674) 444 3882
Tel. No. (674) 444 3106

NEW CALEDONIA

Ms Pascale Lauga
Pharmacist
Health Department of the
Northern Province

NIUE

Ms Minemaligi Pulu
Maternal Child Health Charge Nurse/
EPI Managner
Health Department
P.O. Box 33
Alofi
Fax No. (683) 4265
Tel. No. (683) 4100
E-mail: malolotino@mail.gov.nu

PALAU, REPUBLIC OF

Dr Helen Ngirmekur
Public Health Physician
Ministry of Health
P.O. Box 6027
Koror
Fax No. (680) 488-1211 / 1725
Tel. No. (680) 488-2813 / 2552

SAMOA

Ms Salape Slade
Nurse Manager
Ministry of Health
Private Mail Bag
Apia
Fax No. (685) 21440
Tel. No. (685) 21212

SOLOMON ISLANDS

Mr Raymond Mauriasi
National EPI Coordinator
Ministry of Health and Medical
Services
P.O. Box 349
Honiara
Fax No. (677) 20085
Tel. No. (677) 20420

TOKELAU

Dr Peter Adams
Medical Adviser for Tokelau
74 Waripori Street
Wellington 6002
Fax No. (64) 4 389 6210
Tel. No. (64) 4 389 6259

TONGA

Dr Sunia Foliaki
Senior Medical Officer MCH/FP
Ministry of Health
PO Box 59
Nuku'alofa
Fax no.: (676) 24 293
Tel. no.: (676) 23 200

TUVALU

Ms Eline Soloseni
Public Health Nurse
Public Health Unit
Ministry of Health & Human Resources
P.O. Box 36
Funafuti
Fax No. (688) 20481
Tel. No. 20480 / 20415

VANUATU

Mr Leonard Tabilip
National EPI Coordinator
Deptment of Health
Private Mail Bag 009
Port Vila
Fax No. (678) 26204
Tel. No. (678) 22512

Ms Andrea Garae
Acting Principal Pharmacist
Central Medical Store
Ministry of Health
PMB 009
Port Vila
Fax No. (678) 27618
Tel. No. (678) 22100

WALLIS AND FUTUNA

Dr Roger Deltour
Medecin Chef Hopital de Futuna
De Mata Utu
Wallis
Agence de Sante du erritoire BP 46
98600 Wallis et Futuna

2. TEMPORARY ADVISERS

Dr Susan Shin
Former Short Term Professional
World Health Organization, WPRO
74 Robinson Road, Block 2
15/F, Flat B
Mid-levels, Hong Kong
Fax No. (+) 852-2543-0735
Tel. No. (+) 852-2559-1944

Dr Lisi Tikoduadua
Chairman
Subregional Committee
for Certification of Poliomyelitis Eradication
in Pacific Island Countries and Areas
Suva,
Fiji
Fax no.: 679 303 232.

Dr Lepani Waqatakirewa
Gomati Street
Suva
Fiji Islands
Fax No. (679) 306163
Tel. No. (679) 306177

3. REPRESENTATIVES/ OBSERVERS

AUSTRALIAN AGENCY FOR
INTERNATIONAL DEVELOPMENT

Dr Tiliman Russ
Consultant, AusAID

NEW ZEALAND OFFICIAL DEVELOPMENT
ASSISTANCE (NZODA)

Dr Tom Kiedynski
NZODA
Ministry of Foreign Affairs and Trade
New Zealand
Fax No. 64 4 494 8514

PACIFIC ISLANDS HEALTH
OFFICERS ASSOCIATION
(PIHOA)

Dr Jean-Paul Chaine
Regional Epidemiologist
Department of Health Services
P.O. Box PS70
Palikir
Pohnpei FM 96941
Fax No. (691) 320-5263

5. SECRETARIAT

WHO, WPRO

Dr Yang Baoping
Regional Adviser
Expanded Programme on Immunization
World Health Organization
Regional Office for the Western Pacific
United Nations Avenue
Manila
Philippines

Dr Y. Sato
Medical Officer
Expanded Programme on Immunization
World Health Organization
Regional Office for the Western Pacific
United Nations Avenue
Manila
Philippines

Dr O. Mansoor
Scientist
Expanded Programme on Immunization
World Health Organization
Regional Office for the Western Pacific
United Nations Avenue
Manila
Philippines

Dr J. McFarland
Medical Officer
Expanded Programme on Immunization
World Health Organization
Regional Office for the Western Pacific
United Nations Avenue
Manila
Philippines

Dr M. O'Leary
Epidemiologist
Expanded Programme on Immunization
WHO Representative's Office
3rd Floor YWCA Building
Sukura Park
Suva
Fiji

Mr F. Rousar
Technical Officer
Expanded Programme on Immunization
WHO Representative's Office
3rd Floor YWCA Building
Sukuna Park
Suva
Fiji

Mr Basil Rodriques
Regional Immunization Officer
UNICEF East Asia Pacific Regional Office
Bangkok
Thailand
Fax No. (662) 280 3563
Tel. No. (662) 280 5931
Email: brodriques@unicef.org

UNICEF

Ms Sarita Neupane
Health and Nutrition Officer
UNICEF Pacific Office
Private Mail Bag
Suva, Fiji
Fax No. (679) 301667
Tel. No. (679) 300439
Email: sneupane@unicef.org

Dr Arnold Calo-oy
Immunization Specialist
UNICEF Pacific Office
Private Mail Bag
Suva
Fiji
Fax No. (679) 301667
Tel. No. (679) 300439

Ms Asenaca Vakacegu
Monitoring and Evaluation Office
UNICEF Pacific Office
Private Mail Bag
Suva
Fiji
Fax No. (679) 301667
Tel. No. (679) 300439
Email: avakacegu@unicef.org