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STRATEGIES FOR CONTROL OF MEASLES IN SEAR COUNTRIES

Report of an Inter-Agency Consultation

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Executive Summary

Achieving polio eradication by the end of the year 2000 remains the top priority for the South-East Asia Region. While this target is of major importance, the Consultation met to revise the existing Plan of Action for Measles Control into a joint WHO-UNICEF Plan of Action (PoA) for Measles Control in South-East Asia. In the proposed joint PoA, strategies are recommended for two groups of countries. Group 1 consists of Bangladesh, DPR Korea, India, Myanmar, and Nepal. Group 2 countries consist of Bhutan, Indonesia, Maldives, Sri Lanka, and Thailand.

The major focus of activities among Group 1 countries is to strengthen year-round provision of routine services. This may include strengthened outreach immunization activities. The key objective is to reduce mortality. Among Group 1 countries, supplementary immunization campaigns should focus in areas not being reached by routine services. Any supplemental immunization campaigns should have as primary target coverage of at least 95%. Supplementary immunization should not be conducted unless well-developed plans at the district level for improving routine services have been reviewed. Expansion of this activity should not occur unless 95% coverage has been documented. In these extraordinary cases, conducting campaigns in high-risk areas is intended to accelerate reduction in mortality until routine coverage is improved.

In Group 2 countries (or regions within countries in the case of India and Indonesia), strategies to improve routine immunization for Group 1 apply and should be targeted to high-risk areas (HRAs). Supplemental immunization campaigns can be done in HRAs if Group 1 strategies need to be supplemented.

In Group 2 countries, a nationwide Catch-up campaign can be done if the data suggest an impending outbreak. The objective is to reduce the pool of susceptibles so that outbreaks can be prevented. After the initial campaign, they will use epidemiological data and information on vaccine coverage to establish the need and frequency of periodic follow-up campaigns every few years to address the continuing influx of new susceptibles. A second dose of measles vaccine may be considered in these countries when the system in place can validate coverage for the first dose to be at least 95%, coverage for the second dose can be accurately monitored, and second dose coverage can also reach 95%.

Staging of measles surveillance is based on the progress of the development of high-quality AFP surveillance and the group in which a country is classified. Outbreak investigation should be promoted in all groups. However, the type of data collected in Group 1 would be aggregate by number of cases, age, vaccination status, and location. The measles data collected in outbreak investigations in Group 2 would be case-based with laboratory investigation (at least the initial 10 cases should be investigated - refer to lab manual-. If the country has already conducted a Catch-up campaign, then each suspected case should be investigated and confirmed by laboratory).

Group 1 would expand routine surveillance of aggregate reporting of number of measles cases by linking reports to weekly zero reporting of AFP cases once AFP surveillance indicators reach global targets. These targets are achieving a non-polio AFP rate of at least 1.0 per 100 000 children aged <15 years, collecting two adequate stools from at least 80% of the reported AFP cases, and achieving a 60-day follow-up rate of 80%. Strategies for strengthening the already existing routine reporting system, such as monitoring completeness and timeliness of reporting, should be implemented at the same time. Neonatal tetanus data collection should be encouraged in parallel to measles surveillance activities.

Group 2 expands routine surveillance by aggregate reporting of number of cases by vaccination status, age distribution, and location. In some countries that have conducted successful Catch-up campaigns by reaching 95% coverage, case-based data should be reported.

The priority of the outbreak response should be to reduce mortality through effective case management with inclusion of vitamin A. If implemented, immunization in response to an outbreak should focus on neighbouring areas not yet affected where the outbreak is likely to expand. Other actions included in the outbreak response should address routine coverage, case management, especially in HRAs, and surveillance.

1. INTRODUCTION

This Consultation was organized by EPI/SEARO and was attended by representatives from UNICEF, WHO, and CDC, Atlanta. It was recognized that countries have made great strides to eradicate polio. Participants reconfirmed the commitment and support of their respective agencies to achieving polio eradication target by the end of the year 2000 in all countries. Measles remains one of the major causes of significant morbidity and mortality in the Member Countries of South-East Asia. While achieving the polio eradication target is a major priority, the group met to discuss strategies to control measles using a phased approach.

2. MEASLES SITUATION IN SEAR

The current measles situation in SEAR may be characterized by grouping countries into 2 groups: Group 1 – Bangladesh, India, Democratic People's Republic of Korea (DPR Korea), Myanmar, and Nepal; and Group 2 – Bhutan, Maldives, Sri Lanka, Thailand, and Indonesia. This scheme allows for staging of countries depending upon the development of the programme. The aim is for countries to advance from one group to the next. Group 1 countries are characterized by having extensive transmission of measles virus and large pockets of children with poor routine coverage. Group 2 countries have better coverage and are positioned to improve surveillance by building upon the existing well-functioning AFP surveillance system. However, these countries do not have adequate case-based surveillance with laboratory confirmation.

In 1997 in SEAR, 114 331 measles cases were reported compared to 102 205 measles cases reported in 1996. Gross underreporting of cases occurs in Groups 1 and 2 countries. Reported measles immunization coverage seems to have leveled off at 80% in most countries. Gross discrepancies in reported and survey coverage exist in most countries, which may be as much as 40-60% in Bangladesh, DPR Korea, India, Maldives, Myanmar, and Nepal. The current schedule in most countries calls for one dose of measles vaccine at 9 months of age, with the exception DPR Korea. Thailand also provides a school-entry measles dose.

The age distribution of reported measles cases is quite variable by country. In Sri Lanka, Thailand, Maldives, Indonesia, and Bhutan, a greater proportion of measles cases occur among older children. In general, countries which have advanced further in programme implementation and with better coverage have a greater proportion of older cases.

The development of surveillance among countries has been quite variable. Outbreak investigation is an important source of data for action; while most countries are carrying out outbreak investigations, the quality of their implementation is variable. Laboratory services for measles diagnosis have been developed in Sri Lanka, Thailand, and Indonesia.

Recent recommendations put forth by the Technical Consultative Group (TCG) of EPI/SEARO focus on increasing outbreak prevention activities, expanding outbreak investigation activities, improving routine coverage, and developing of plans of action (PoA) for measles control in all countries. To date, only Bangladesh and Indonesia have produced comprehensive long-term PoAs.

Attention has also been directed to identify high-risk areas (HRAs) to improve coverage and to start supplemental immunization.

A review of measles campaigns conducted by the countries was presented and may be summarized as follows:

- Bangladesh – Limited Campaign In 1998 In Flood Areas;
- Bhutan – 1995 among children aged 9-59 months;
- India – city campaigns 1995-97 in Delhi and UP;
- Maldives – 1995-97 among children aged 5-14 years;
- Myanmar – 1997 in cities;
- Nepal – limited campaign in 1995;
- Thailand – outbreak response immunization.

The major conclusion from the review of these activities is that currently there exists no clear plan of action.

3. GLOBAL SITUATION

Globally, measles control presents a number of challenges: (1) achieving and certifying polio eradication globally; (2) reducing measles mortality in countries where the disease burden is higher, mainly sub-Saharan Africa and South East Asia; (3) generating long-term commitment; (4) implementing the elimination strategies properly in the polio-free countries with a measles elimination goal; (5) improving coverage, establishing surveillance, and (6) strengthening case management. Other challenges include: research and operational issues, simple methods to monitor the number and distribution of susceptibles, documentation of impact of enhanced immunization activities in HRA, injection safety, effect of HIV on the current measles control/elimination strategies, cost-benefit of different strategies.

Campaign strategies to achieve elimination include: Catch-up, Keep-up, Follow-up. Active surveillance is another important component of elimination strategies. The strategies are evolving and they require a high degree of flexibility. Quality of implementation is a key issue. The return of measles in PAHO was cited as an example of the result of incomplete implementation of the recommended strategies.

The global focus for 1999 is to: finalize the global plan of action, improve coordination among partners, complete Regional PoAs, promote addressing remaining research issues and establishing a laboratory network. A phased approach has been introduced by classifying countries with priority actions and plans of action, taking into account such a phased approach, are being written while highlighting the importance of achieving polio eradication before embarking on measles elimination.

One dose of measles vaccine given at 9 months of age provides the most effective balance between decay of maternal antibodies, age-related morbidity and mortality, and infant's immunologic response.

The priority remains to achieve good coverage with one dose of measles vaccine.

4. MEASLES ELIMINATION - THE PAHO EXPERIENCE

Elimination of measles in the Americas started in 1994 when the Pan American Sanitary Conference adopted a resolution to eliminate measles from the Western hemisphere by the year 2000. This resolution was introduced only after polio eradication had been certified. Measles elimination is using primarily the following campaign strategies: (1) Catch-up campaigns target all children 9 months - 14 years of age regardless of previous immunization status; (2) Keep up campaigns strengthen routine services with the aim to reach all children 12-23 months achieving at least 95% routine coverage; and (3) Follow-up campaigns periodically target all children from a selected age-group (those born after the initial Catch-up campaign) based on available data, regardless of immunization status. The purpose of the follow-up is to maintain low levels of susceptibility in the population. They are repeated every few years to prevent outbreaks and eliminate transmission. In PAHO, catch-up campaigns have been implemented in all countries with the exception of the USA between 1988 and 1993, followed by Follow-Up campaigns in most countries since 1993. The US is using a two-dose strategy rather than a campaign approach because it has a system capable of achieving high coverage with both doses and to follow defaulters.

In addition, laboratory investigation is required for every suspected measles case reported in PAHO. An extensive region-wide laboratory network has been developed. In 1996, there was a 99% reduction in measles cases when compared to 1990.

However, in 1997, a huge outbreak occurred with 53,000 reported measles cases in Sao Paulo, Brazil, including 61 deaths, mostly among infants. The primary cause of failure was the lack of proper implementation of strategies, particularly the Follow-up campaign had not been implemented. Data showed that the virus causing the outbreak had been imported from Europe. Unvaccinated adults (outside target age group of the Catch-up and coming from rural areas where routine coverage was low) and unvaccinated infants younger than one year of age (failure to fully implement the strategy) were the main victims. Risk factors for infection included: contact with measles case at workplace, male gender, born in rural areas, not living in Sao Paulo in 1987 (i.e., during the Catch-up campaign), migrant workers, and international travellers.

5. PERSPECTIVES BY AGENCY

5.1 CDC

CDC's policy on measles states that measles elimination is possible with existing vaccines and technology. U.S. Congress supports CDC's efforts by financing efforts to supplement immunization and to expand laboratory support in the context of global infrastructure without compromising ongoing polio eradication activities.

Three groups in CDC work on measles: international (VPDED), domestic (ESD), and laboratory (NCID). CDC has staff in various WHO offices and WHO/HQ. Priorities include enhancing collaboration with other partners and learning from previous experiences. A PoA is needed for CDC planning, preferably 3-5 years in advance.

PoA should include components for safety plan (injection safety and disposal plans), surveillance and evaluation. Research is focusing on needle-less devices, HIV impact and strategies in densely-populated urban areas.

5.2 UNICEF

UNICEF generally focuses on Region-specific strategies. UNICEF's mandate is based on the World Summit for Children goals and on the Convention for Rights for Children. Reduction in measles mortality is a priority for UNICEF. Twenty countries carry most of the measles burden. In Asia, the focus of support is directed to Afghanistan, Pakistan, India, and Indonesia..

UNICEF supports strategies related to sustainable development of primary care (through measles routine immunization, routine Vitamin A supplementation and improved management of measles cases), supplemental campaigns when appropriate (especially in urban and high-density areas), high-quality surveillance and measles control to develop health care systems. Urban measles is of special importance to UNICEF and the strategies include precise determination of target areas and target groups, evaluation of each campaign, linkage with Vitamin A and OPV administration, safety of injection, political and urban strategy commitment, social mobilization and timing of intervals.

The principles of UNICEF collaboration and support include: strengthening and expanding partnerships, development of long-term plans, using phased approaches, promoting routine immunization coverage and surveillance, using time-lines, and integrating activities with other health initiatives.

Issues Related to Vitamin A

Prevalence of vitamin A deficiency in SEAR countries ranges from 0.3% to 1%.

Issues related to vitamin A administration and measles control include those related to mortality, blindness, and logistics. Of all childhood deaths, 54% occur among malnourished children. Among measles cases, mortality can be reduced by up to 50% if vitamin A supplementation is given.

WHO is currently emphasizing on the need to administer Vitamin A supplementation during the EPI contacts in all areas where VAD is known or suspected. Current recommendations for vitamin A administration are: 100 000 IU at 9 months when measles vaccine is administered. There is no recommendation for administration to children prior to 6 months of age; however, post-natal maternal supplementation (within six weeks of delivery) is being recommended. Health workers should use the BCG or DPT1 contact to provide the supplementation to the mother. Vitamin A supplementation with NIDs should be done in suspected areas where vitamin A deficiency exists. NIDs and mass vaccination campaigns offer an opportunity to deliver vitamin A, especially to hard-to-reach populations. An additional dose should be administered 4-6 weeks later, for that reason a VAD day or a similar strategy should be planned and implemented. However, managers should identify strategies to sustain the delivery of Vitamin A.

Strategies should be designed and integrated into existing systems. Vitamin A supplementation should not divert other nutritional approaches.

6. SUMMARY OF THE GLOBAL AND REGIONAL POLIO SITUATION

Globally, polio transmission has largely been reduced to the Indian sub-continent and sub-Saharan African area. To eradicate polio, routine coverage needs to be improved, NIDs need to be continued in the remaining polio endemic countries, high-quality surveillance needs to be developed

and sustained and house-to-house mopping-up campaigns will need to be conducted. To that end, in India in 1999 at least three extra rounds of OPV supplemental immunization rounds will be added to the already existing strategies.

7. PROPOSED PLAN OF ACTION FOR MEASLES CONTROL IN SEAR

Key points of the SEAR PoA for measles control were discussed and included: routine immunization, supplemental immunization campaigns, surveillance, case management, and programme monitoring. The detailed recommendations are now included in the revised PoA. A summary of the major discussion points and recommendations follows:

Immunization

Clearly, the major focus of activities among Group 1 countries is to strengthen year-round provision of routine services. The key objective is to reduce mortality. Routine services are provided through fixed sites or by repetitive periodic outreach where fixed services are deficit. Periodic outreach is conducted nationwide in areas where fixed site services are not feasible, such as unauthorized slums. The results of such activities are reflected in routine coverage figures.

Among Group 1 countries, supplementary immunization campaigns should focus on areas not being reached by routine services. The aim is to reduce mortality and increase coverage. To that end, any supplemental immunization should have as primary target coverage of at least 95%. Supplementary immunization should not be conducted unless well-developed plans at the district level for improving routine services have been reviewed. Expansion of this activity should not occur unless efforts to achieve 95% coverage have been documented. In these extraordinary cases, conducting campaigns in high-risk areas is intended to buy time until routine coverage is developed.

Among Group 2 countries (or regions within countries in the case of India and Indonesia), strategies for Group 1 apply and should be targeted to HRAs. In Group 2 countries, coverage in HRAs needs to be improved using Group 1 strategies. Mass campaigns should be done in HRAs if Group 1 strategies need to be supplemented.

If analysis of the data suggest an impending outbreak, a nationwide Catch-up campaign can be done nationally. The objective is to reduce the pool of susceptibles so that outbreaks can be prevented. As indicated by the epidemiological data, they will need to conduct follow-up campaigns every few years to address the continuing influx of new susceptibles. A second dose of measles vaccine may be considered in these countries when the system in place can validate coverage for one dose of 95%, coverage for second dose can be accurately monitored, and coverage can also reach at least 95%.

Surveillance

Staging of measles surveillance is based on the progress of development of high-quality AFP surveillance. Outbreak investigation should be promoted in all groups. However, the type of data collected in outbreak investigations in Group 1 would be aggregate by number of cases, age, vaccination status, and location. The data collected in Group 2 would be case-based with laboratory confirmation for at least ten cases.

Group 1 would expand routine surveillance of aggregate reporting of number of measles cases by linking reports to weekly zero reporting of AFP cases once AFP surveillance indicators reach global

targets. These targets are achieving a non-polio AFP rate of at least 1.0 per 100 000 children aged <15 years, collecting two adequate stools from at least 80% of the reported AFP cases, and achieving a 60-day follow-up rate of at least 80%. Strategies for strengthening the already existing routine reporting system, such as monitoring completeness and timeliness of reporting, should be implemented at the same time. Reporting cases of neonatal tetanus should be encouraged in parallel to measles surveillance.

Group 2 expands routine surveillance by aggregate reporting of number of cases by vaccination status, age distribution, and location. In some countries that have conducted successful Catch-up campaigns by reaching 95% coverage, case-based data (with laboratory confirmation) should be reported.

8. OUTBREAK RESPONSE AND CASE MANAGEMENT

The priority of the outbreak response should be to reduce mortality through effective case management with the inclusion of vitamin A. Immunization in response to an outbreak should focus on neighboring areas where the outbreak has yet to reach. Other actions included in the outbreak response should address routine coverage, case management, especially in HRAs, and surveillance.

In suspected vitamin A deficiency areas, vitamin A should be included as an important component in all measles activities.

9. MEASLES PROGRAMME MONITORING

Following data and indicators should be used to monitor programme progress:

Group 1 and Group 2

- Number of district by coverage level: < 50%, 50-79% , >80%
- Yearly change of number of districts by coverage level
- Drop-out rates BCG / Measles or DPT1/MSL
- Yearly reduction in drop-out rates
- Percentage of outbreaks investigated with a minimum of aggregate data
- Proportion of HRA that achieved $\geq 95\%$ coverage during supplemental measles immunization

Group 2¹

- Susceptibles² as proportion of birth cohort
- Number of HRA with supplemental immunization activities with coverage level < 80%, 80-94% and $\geq 95\%$ prior to mop-up activities

¹ Details on surveillance can be found in WHO publication "Using Surveillance Data and Outbreak Investigations to strengthen measles immunization programmes", WHO/EPI/Gen/96.02

² "susceptibles" is the total of :

- New susceptibles = newborn x vaccine coverage x vaccine efficacy, PLUS
- Old susceptibles = individuals in older age groups (e.g. 8 years) not targeted by a campaign

- Number of HRA with supplemental immunization activities with coverage level < 80%, 80-94% and \geq 95% after mop-up activities
- Percentage of outbreaks investigated with case-based data, including laboratory confirmation of the outbreak
- Percentage of districts with timely (\geq 80% of reports) zero reporting.

For countries having implemented Catch-up campaign, following two indicators should also be monitored

- Number of districts with Catch-up or Follow-up campaign with coverage level < 80%, 80-94% and \geq 95% prior to mop-up activities
- Number of districts with Catch-up or follow-up campaign with coverage level < 80%, 80-94% and \geq 95% after mop-up activities
- Percentage of cases with case-based data, including laboratory confirmation of the case
- Percentage of blood specimens with results reported within 7 days of receipt in the laboratory

Neonatal Tetanus

Neonatal tetanus has an elimination goal by the year 2000. NT data collection should be organized in parallel with measles data collection.

To improve coverage, routine needs to be strengthened similar to the approaches taken for measles. Where pregnant women do not attend ANC although the services are available, an integrated approach is needed to improve health care services. Supplemental immunization activities should be organized in pocket areas that cannot be reached in areas where ANC utilization is 60% or above. Where ANC utilization is below 60% district-wide campaigns are more appropriate.

Annex 1

AGENDA

1. **Current situation on measles control in SEAR**
2. **GLOBAL OVERVIEW**
 - Measles situation and strategies by continent
 - WHO, UNICEF, CDC policy
 - Funding situation
3. **Details on experiences in other WHO regions, with focus on objectives and recommended strategies**
 - Elimination of measles in the Americas
 - Plans of action in Africa and WPRO
4. **Discussion**
5. **Overview of current situation with measles and polio in SEAR**
 - Polio: achievements, constraints, priorities
 - Interaction and prioritization polio-measles-NT
6. **Summary of draft Plan of Action in SEAR: working paper for detailed discussion**
 - Objectives
 - Gradual increase in activities
 - Proposed time frame
7. **Discussion on strategies for measles in SEAR**
 - Objectives and prioritization
 - Immunization strategies: urban campaigns, two-dose, catch-up campaigns, routine EPI
 - Surveillance: link to AFP, outbreak/case confirmation, place of laboratory confirmation
 - Outbreak response: investigation, confirmation, containment
 - Case management: mortality reduction, vitamin A, involvement health sector
 - Requirements of a country plan for supplementary immunization campaigns
 - Ensuring safe injections, disposal of hazardous waste
 - Responsibilities of major agencies
 - Funding
8. **Brief discussion on neonatal tetanus strategies**
 - Is the campaign approach preferable over a strengthening of routine services?
 - Are multiple antigen campaigns feasible
9. **Conclusions and Recommendations**
10. **Formulation of consensus statement on measles**

Annex 2
PROGRAMME

Wednesday, 24 February 1999

0900 HRS	Inaugural Session	
	Opening remarks	Dr Imam Mochny
	Introduction of participants	Dr Jon Andrus
	Plenary session	
0945 - 1000	SEAR - Current situation on measles control	Dr Jos Vandelaer
1000 - 1100	Global overview	
	- Measles situation and strategies by continent	Dr Jean Marc Olive
	- CDC statement	Dr Roland Sutter
	- UNICEF statement	UNICEF
	- Vitamin A and measles	Dr Sultana Khanum
1100 - 1130	Details on experiences in other WHO Regions with focus on objectives and	
	- Elimination of measles in Americas	Dr Roland Sutter
	- Plan of Action in Africa and WPRO	Dr Jean Marc Olive/ Dr A.M. Henao
1130 - 1145	Discussions	
1145 - 1215	Overview of current situation with measles and polio in SEAR	
	- Polio achievements, constraints, Priorities	Dr Jon Andrus
	- Interaction and prioritization Polio-Measles-	Dr Jon Andrus
1300 - 1330	Summary of draft Plan of Action in SEAR: Working paper for detailed discussion	
	- Objectives	} Dr Jos Vandelaer
	- Gradual increase in activities	
	- Proposed time frame	

Wednesday, 24 February 1999

- 1330 - 1430 Discussion on strategies for measles in SEAR
- Objectives and prioritization
 - Immunization strategies : urban campaigns,

- 1445 - 1615 Discussions on strategies for measles in SEAR
(Cont'd...)
- Surveillance: link to AFP, outbreak/case
Confirmation, place of laboratory confirmation
 - Outbreak response: Investigation,
 - Case management: Mortality reduction,

Thursday, 25 February 1999

- 0830 - 0930 & 0945 - 1200 Discussions on strategies for Measles in SEAR (Contd...)

- Requirements of a country plan for
Ensuring safe injections, disposal of hazardous
- Responsibilities of major agencies
- Funding

- 1200 - 1230 Brief discussion on neonatal tetanus strategies
- How to improve protection for WCBA in High risk
 - Are multiple antigen campaigns feasible?

- 1300 - 1430 Conclusions and Recommendations

- 16.00 Formulation of consensus statement on measles

Annex 3**LIST OF PARTICIPANTS**

1. Dr Jean Marc Olive, Ag. Chief, EPI, WHO/HQ, Geneva
2. Dr Ana Maria Henao Restrepo, Medical Officer/EPI, WHO/HQ, Geneva
3. Dr Roland Sutter, CDC, Atlanta, USA
4. Dr Suomi Sakai, Sr. Health Advisor, Immunization, UNICEF/HQ, New York, USA
5. Dr Francois Gasse, UNICEF/HQ, New York, USA
6. Dr Rudolf Knippenberg, Regional Advisor - Health and Nutrition, UNICEF/EAPRO
Bangkok, Thailand
7. Dr (Mrs) Ellen Girerd-Barclay, Regional Advisor - Health and Nutrition, UNICEF/ROSA
Kathmandu, Nepal
8. Dr Stephen Atwood, Chief of Health Section, UNICEF/India Country Office
New Delhi, India
9. Dr K. Suresh, Project Officer, UNICEF/India Country Office, New Delhi, India
10. Dr Gary W. Hlady/Dr Kaushik Banerjee, NPSP, New Delhi, India
11. Dr Imam Mochny, Ag. Chief, EPI, WHO/SEARO, New Delhi, India
12. Dr Jon Andrus, Regional Adviser-Polio, EPI, WHO/SEARO, New Delhi, India
13. Dr Sultana Khanum, Regional Adviser-Nutrition, WHO/SEARO, New Delhi, India
14. Mr John Fitzsimmons, Technical Officer-EPI, WHO/SEARO, New Delhi, India
15. Dr Jaspal Sokhey, Consultant, Vaccine Supply and Quality, WHO/SEARO, New Delhi, India
16. Ms Sonja Schmidt, Consultant, Surveillance, WHO/SEARO, New Delhi, India
17. Dr Jos Vandelaer, Consultant, Other Vaccine Preventable Diseases, WHO/SEARO, New Delhi,
India - (also coordinator of the meeting)

