WORLD HEALTH ORGANIZATION
EUROPE

Measles and Rubella Surveillance and Monitoring Vaccination Coverage in Countries with Complex Health Care Systems

Paris, France, 20-21 September 2004

Vaccine-preventable Diseases and Immunization

ABSTRACT

The *Strategic plan for measles and congenital rubella infection in the WHO European Region*, was developed and implemented in 2002 and includes two objectives for 2010: interruption of indigenous measles transmission and the prevention of congenital rubella infection (CRI; less than one case of congenital rubella syndrome [CRS] per 100 000 live births). It has been recommended that the plan be revised to include the objective of measles and rubella elimination by 2010 along with CRI prevention. The *Surveillance guidelines for measles and congenital rubella infection in the WHO European Region*, published in 2003, were developed to meet the previous measles and rubella control targets but need to be revised to strengthen the CRS surveillance component and accommodate the rubella elimination objective. Thirty-five participants representing 20 Member States and WHO participated in a technical consultation to address outstanding surveillance issues related to these diseases. Eight recommendations were made regarding definitions and surveillance performance indicators for use in the WHO European Region.

Keywords

MEASLES – PREVENTION AND CONTROL
RUBELLA – PREVENTION AND CONTROL
RUBELLA SYNDROME, CONGENITAL – PREVENTION AND CONTROL
IMMUNIZATION PROGRAMS – ORGANIZATION AND ADMINISTRATION
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  WHO Regional Office for Europe
  Scherfigsvej 8
  DK-2100 Copenhagen Ø, Denmark

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Executive Summary

The WHO Regional Office for Europe and the French Ministry of Health co hosted a meeting in Paris, 20-21 September 2004, whose objectives were to provide a forum for countries in Western Europe and North America with more complex health systems to exchange experiences, best practices and methods for laboratory surveillance and the measurement of vaccine coverage. The meeting was attended by 44 persons from 15 countries and representatives from WHO Geneva and the regional offices in Europe and the Americas. Eighteen recommendations were developed in the areas of: 1) Vaccination coverage measurement, 2) Unvaccinated or hard-to-convince populations, 3) Laboratory investigation of measles/rubella cases: patient and primary health care physician issues, and 4) Laboratory-supported surveillance: laboratory network and surveillance strategy. The recommendations are intended for use by WHO and Member States of the WHO European Region to assist them in meeting the 2010 objectives for measles and rubella in the WHO European Region.

Introduction

The Strategic plan for measles and congenital rubella infection in the WHO European Region has two overall objectives for 2010:

1. To interrupt the indigenous transmission of measles; and
2. To prevent congenital rubella infection (< 1 case of congenital rubella syndrome (CRS) per 100,000 live births).

To achieve these targets, high levels of coverage with measles and rubella vaccines and sensitive, specific and timely surveillance of vaccination coverage and disease incidence are required.

The 52 Member States in the WHO European Region are very diverse in the structure, administration and funding of health systems, virology services and childhood vaccination programmes. Some of these countries have quite complex systems with regionalized public health decision-making, multiple public and private health care providers and an extensive number of private laboratories and private laboratory networks. The WHO Regional Office for Europe (EURO) and the French Ministry of Health co hosted a meeting, whose objectives were to provide a forum for countries in Western Europe and North America with more complex health systems to exchange experiences, best practices and methods for laboratory surveillance and the measurement of vaccine coverage. Planning for the meeting was done through the assistance of an organizing committee. Members of the organizing committee and meeting participants are identified in Annex 1, and the agenda can be found in Annex 2.

The meeting was opened by Professor William Dab, Director General of Health, French Ministry of Health, who identified the need for such a meeting as a means to achieve common end points despite highly varied health care systems in the WHO European Region. To achieve the Regional targets for measles and rubella, it will be necessary to have strong national policies and direction; to address concerns of physicians and the public about the need for and effectiveness

of immunization; and to overcome barriers to accessing immunization services. In France over the last 20 years, immunization services have been decentralized; however, in 2005 there will be a nationally coordinated approach as the result of a bill recently passed by the National Assembly.

Dr Nedret Emiroglu, Regional Advisor, Vaccine Preventable Diseases and Immunization, EURO, stated in her opening remarks that the Strategic plan for measles and congenital rubella infection in the WHO European Region was an integrated approach to the control of these diseases that took into account the current extensive use of combined measles-rubella vaccines in the Region and recognized the need for country-specific solutions for achieving the objectives.

Following the plenary sessions, which included presentations from the WHO European and American regional offices and from most of the participating countries, participants were divided into breakout groups to address specific questions. The breakout groups were:

- Measuring vaccination coverage
- Addressing unvaccinated or hard-to-convince populations
- Laboratory investigation of measles/rubella cases: patient and primary health care physician issues
- Laboratory-supported surveillance: laboratory network and surveillance strategy

A summary of each working group's discussion and recommendations are included as part of this meeting report. EURO will use these recommendations to help with planning and prioritizing its activities in the coming years.

Recommendations of working groups

Vaccination coverage measurement

Summary of discussion

Vaccination coverage data can be obtained from routine administrative data or through use of surveys; some of the participating countries used both approaches. Given the complexity of the health care systems, some countries had developed administrative methods for measuring coverage that relied on health certificates or number of children completing a primary immunization series; the denominator being derived from census data or based on the number of health certificates.

Surveys can provide valid information on immunization coverage, particularly among pre school children; however, there are growing difficulties related to these methods due to the large sample sizes required to get precise estimates, the expense associated with trace back to physician records to verify the responses and the increasing use of mobile telephones and unlisted telephone numbers.

Vaccination registries and computerized health records at the local/ provincial level have been used and may provide a good alternative in the future. School-based surveys may also be an inexpensive alternative, providing good quality data on older children; however, surveys at

school entry depend upon an adequate culture of record retention, and they do not give timely information on MCV1 or MCV2 coverage if the latter is given before school entry.

Recommendations
1. Countries without comprehensive computerised child health register should consider moving towards employing such systems;

2. Countries with multiple providers of vaccination and fragmented administrative arrangements for child health should seek to obtain samples representing the total birth cohort and immunisation status by representative sampling of the childhood population at appropriate settings, such as Public and private GP clinics and mother and child health clinics;

3. Use birth cohort registries or census data when possible to determine immunization coverage; however, administrative databases may need to act as proxies if these databases do not exist or cannot be accessed;

4. Establish reliable and representative surveys of individuals within target age groups and setting, particularly children and pregnant women at local surveillance sites, such as child health and other relevant points of access to the health care system.

Unvaccinated or hard-to-convince populations

Summary of discussion

Hard-to-reach individuals and groups in the WHO European Region were classified as: 1) hard core opponents (i.e., persons opposed to immunization based on religious or philosophical beliefs), 2) the inadequately informed (e.g., parents who seek more information than what is routinely provided), and 3) those with decreased access to the health system (e.g., immigrants, migrants, and ethnic minorities); groups #2 & #3 were felt to be "reachable" through media (journalists and internet), through general practitioners and other health care professionals, and possibly through school-based health professionals, where these existed.

Better country- and/or culture-specific information was felt to be needed in many countries regarding immunization knowledge, attitudes and practices among hard-to-reach populations and the health professionals who care for them. An evaluation would be useful of previous initiatives, currently available tools, and the interest and ability of health professionals to access existing tools. More effort was also needed to increase the availability of information for health care professionals and the public using list serves (e.g., Immunization Action Coalition); linked immunization safety websites (e.g., Vaccine Safety net); information sources providing health professionals with answers to specific immunization-related questions (e.g., Infovac); and possibly through media workshops on immunization-related issues.

Recommendations
1) An immunization day or week should be considered by countries as a way to increase awareness of health professionals about immunization. While this may be too complex an undertaking to implement soon throughout the WHO European Region, the implementation of these activities on a pilot basis could provide an opportunity to encourage countries to develop and use approaches specific to them and to assess the efficiency and effectiveness of these approaches.

2) WHO/EURO or other organizations not directly linked to vaccine manufacturers should consider developing more high-quality, internet-based information sources, including a newsletter similar to that of the Immunization Action Coalition. These sources should have web links; a place to ask questions or provide comments; and news on outbreaks, training activities, supplementary immunization activities, research; and innovative communication tools; however, it was appreciated that ensuring completeness and timeliness of information would be difficult.

3) WHO/EURO develop a questionnaire on with a range of issues targeting countries participating in the meeting, including items on:

- Recent outbreaks, press releases, news "stories"
- Operational research
- Evaluation studies
- Tools developed
- Actions carried out/being planned
- Websites
- Current curriculum, training/information available for physicians
- Specific actions for migrant communities
- Cost-benefit information available
- Political interest in immunization

Laboratory investigation of measles/rubella cases: patient and primary health care physician issues

Summary of discussion

Most countries estimated a 30%-40% sample collection rate from suspected cases of measles and rubella, although the UK and Spain were close to the target of >80%; problems were not felt to occur with testing or reporting of results. Sample collection was relatively easy during outbreaks but difficult in the low incidence, inter-epidemic periods. Successful policies and strategies for achieving >80% laboratory assessment included teaching medical students about the importance of reporting clinically suspected cases to health authorities; having laboratory testing free of charge to patients and physicians; and improving links between private and public health systems. Mandatory reporting can encourage physicians to report, but additional financial compensation was felt to be a needed incentive in some Member States. The rapid reporting of results from laboratories, and the regular analysis and reporting of national data are essential to keep health practitioners aware of measles control efforts, as are use of monitoring and reporting performance indicators.

Serum specimens should remain the gold standard for case confirmation, but oral fluid and dried blood samples could add value to measles surveillance efforts. These alternative sampling techniques (AST) would be useful for increasing the collection of samples from suspected cases in specific situations such as in logistically difficult or geographically remote areas. Programmatic, financial and logistical issues on the use of AST have yet to be fully evaluated, and it was felt to be too early to develop national policies on their use.

Measles and rubella genotype information is critical for assessing progress in achieving measles and rubella elimination. Private laboratories are reliable and frequently well accredited, but they only perform tests paid for by the Ministry of Health. Countries with private laboratories felt the necessity to develop parallel infrastructures to obtain specimens for virologic and genotypic

analysis. Most countries did not test measles-negative samples for rubella IgM and did not have good data on the incidence of rubella, although all had established rubella antenatal screening. Limited CRS surveillance was performed in some countries.

Operational research was needed in the field of rubella diagnosis for validation of the newly developed rubella oral fluid assay; validation of the rubella dried blood method; validation of existing rubella kits for use on dried blood and oral fluid; and the investigation on the stability of IgM and RNA in oral fluid specimens. The need for methods for collecting reliable CRS surveillance data was also identified.

Recommendations

1. Countries are encouraged to monitor and report the number of suspected cases of measles and rubella and the percentage of these from whom samples were collected and tested.

2. Countries need to make individual assessments on use of methods for oral fluid and dried blood samples in the laboratory-supported investigation of measles and rubella.

3. National measles and rubella laboratories should report within three months their molecular epidemiological data to the WHO/EURO M/R Laboratory Network.

4. Countries are encouraged to develop an infrastructure to collect samples for investigation of measles and rubella chains of transmission detected through primary health services.

5. Opportunities to integrate measles and rubella surveillance should be utilized and rubella IgM testing conducted on measles-negative specimens.

6. Countries are encouraged to strengthen CRI/CRS laboratory-supported surveillance activities.

Laboratory-supported surveillance: laboratory network and surveillance strategy

Summary of discussion

There were general concerns about the quality of case-based surveillance for suspected measles infection and of surveillance for clusters of rash-fever illness. The WHO definition for "suspected" measles is broad enough to ensure sensitive detection of cases by clinicians using the existing approach; however, the optimal approach for surveillance of rubella will depend on the specific rubella control strategy adopted, i.e., should surveillance be targeting congenital rubella syndrome, rubella in the general population, pregnant women, specific age groups or high risk populations (e.g., immigrants or case contacts).

General practitioners and paediatricians are the most common access points for suspected measles and rubella cases to the health care system, and they need to be provided with all that is required to send specimens for laboratory testing, to obtain results of these tests, and to notify local public health authorities of the positive results. Charges to the physician or patient for laboratory testing of clinical specimens for measles and rubella antibody can be an impediment to the effectiveness of the surveillance system.

Public health laboratory networks, including private diagnostic laboratories, have a key function for ensuring and/or providing accredited services for measles and rubella testing. Quality

assurance is best maintained through proficiency testing programs. Since clinicians can confuse measles and rubella, these laboratories need to test for both whenever a specimen from a suspected measles or rubella case is submitted; however, allocation of resources for rubella surveillance and testing should be carefully considered with other immunization-related priorities. The interpretation of rubella laboratory test results can also have consequences for the patient, so appropriate expertise should be readily available to assist with this. Criteria to monitor the effectiveness and efficiency of the laboratory network include the timeliness and completeness of reporting of: all test results to physicians; all positive results to public health authorities; and at least aggregate reporting of all negative test results on a monthly basis to public health authorities.

Incentives can be useful for clinicians and laboratories to encourage the timely submission specimens and the reporting of test results. Incentives can include
feedback in the form of surveillance reports; continuing medical education credits to physicians; and direct or indirect payments, e.g., reimbursement for reporting could be tied up to proper reporting.

The linkage of clinical and laboratory data in surveillance data bases is needed for analysis at local and national levels. Mechanisms to ensure patient confidentiality and anonymous reporting are needed. Regular external validation (e.g. comparison of incidence in countries in the same elimination phase, or randomly test serum samples for measles in a given age group with rash fever diagnosis) helps to ensure good implementation.

Recommendations

1. National laboratory surveillance networks should have sound administration, ensured funding for public health work and surveillance reporting, and provide timely integration of data from laboratories within networks.

2. Local, regional and national surveillance need to be strengthened to ensure the timely collection of clinical and laboratory data, record linkage of clinical and laboratory data, and complete and thorough investigation of cases for possible chains of transmission of measles and rubella.

3. Financial impediments should be removed for testing and reporting of test results from designated public health surveillance laboratories.

4. The objectives of surveillance for rubella should be better defined within the context of the existing Regional strategy to prevent congenital rubella infection.

5. Operational research should assess the long-term rubella immunity in the general population in countries where the second dose of vaccine is given at a young age and natural infection no longer occurs.

Annex 1

List of participants

Austria

Dr Jean-Paul Klein
Abteilung VI/B/21
Bundesministerium für Gesundheit und Frauen (BMGF)
Sektion VIII/D/2
Radetzkystrasse 2 / 1 K03
A-1030 Vienna
Austria

Telephone : +431 71100 4103/4105
Fax No. : +43 1 713 44 04 1520
Email: jean-paul.klein@bmgf.gv.at

Dr Reinhild Strauss
Fachexpertin
Koordination und Seuchenbekämpfung
Generaldirektion Öffentliche Gesundheit
Bundesministerium für Gesundheit und Frauen (BMGF)
Radetzkystrasse 2
1030 Vienna
Austria

Telephone No. : +43 1 711 00-4367
Fax No. : +43 1 715 73 12
Email: reinhild.strauss@bmgf.gv.at

Belgium

Prof Partrick Goubau
Chairman of the Committee for the Measles Elimination
Cliniques universitaires Saint-Luc
Service de Microbiologie-Unité de Virologie
Brussels
Belgium

Telephone No. : +32 2 764 34 20
Fax No. : +32 2 764 31 63
Email: goubau@mblg.ucl.ac.be

Dr Tinne Lernout
Epidemiology Section
Scientific Institute of Public Health
14, J.Wytsmanstraat
B-1050 Brussels
Belgium

Telephone No. : +32 2 642 5747
Fax No. : +32 2 642 5410
Email: tinne.lernout@iph.fgov.be

Dr Béatrice Swennen
Secrétariat Scientifique du Conseil
Supérieur d'Hygiène
Rue de l'Autonomie 4
1070 Brussels
Belgium

Telephone No. : +32 2 525 09 00
Fax No. : +32 2 2 525 09 77
Email: beatrice.swennen@health.fgov.be

Bulgaria

Dr Radosveta Filipova Ivanova
Chief expert of MoH
Ministry of Health
5, Sveta Nedelja sq.
Sofia 1000
Bulgaria

Telephone No. : +359 2 93 01 211
Fax No. : +359 2 93 01 183
Email: rfilipova@mh.government.bg

Dr Nina Gatcheva
Head
Epidemiological Department
National Center of Infectious and
Parasitic Diseases
26, Yanko Sakarov Blvd.
Sofia
Bulgaria

Telephone No. : +359 2 438102
Fax No. : +359 2 465517
Email: epidep@ncipd.netbg.com

Canada

Dr Sam Ratnam
Clinical Associate Professor
Faculty of Medicine, MUN
Director, Newfoundland Public Health
Laboratory, Leonard A. Miller Centre
PO Box 8800, 100 Forest Road
St. John's, Newfoundland and Labrador
A1B 3T2
Canada

Telephone No. : +1 709 777 6568
Fax No. : +1 709 777 7070
Email: Sam.Ratnam@hccsj.nl.ca

Denmark

Dr Steffen Glismann
Department of Epidemiology
Statens Serum Institut
Artillerivej 5
2300 Copenhagen S
Denmark

Telephone No. : +45 3268 8414
Fax No. : +45 3268 3878
Email: stg@ssi.dk

France

Dr Marta A. Balinska
Coordinateur de programme-maladies infectieuses
Direction des affaires scientifiques
Institut national de prévention et d'éducation pour la santé (INPES)
42 bd de la Libération
93203 Saint-Denis Cedex
France

Telephone No. : +33 1 49 33 22 85
Fax No. : +33 1 49 33 22 30
Email: marta.balinska@inpes.sante.fr

Dr Isabelle Bonmarin
Institut de veille sanitaire
12, rue du Val d´Osne
94415 Saint-Maurice cedex
France

Telephone No. : +33 141 79 6700
Fax No. : +33 141 79 6767
Email: i.bonmarin@invs.sante.fr

Mme Chantal Cases
Ministère de la santé et de la protection sociale DREES/OSAM
11, Place des cinq martyrs du lycée Buff
75696 Paris Cedex 14
France

Telephone No. : +33 1 40 56 80 61
Fax No. : +33 1 40 56 81 20
Email: chantal.cases@sante.gouv.fr

Prof Daniel Floret
Hopital Edouard Herriot
Sevice d'urgence et de réanimation pédiatrique
Place d'Arsonval
69437 Lyon Cedex 03
France

Telephone No. : +33 04 72 11 0330
Fax No. : +33 04 72 11 0333
Email: daniel.floret@chu-lyon.fr

Dr Sabine Henry
DDASS de Paris
75, rue de Tocqueville
Paris Cedex 17
France

Telephone No. : +33 1 58 57 14 61
Fax No. : +33 1 58 57 1103
Email: sabine.henry@sante.gouv.fr

Dr Daniel Levy-Bruhl
Infectious Diseases Unit
Institut National de Veille Sanitaire
12, rue du Val d'Osne
94415 Saint-Maurice Cedex

Telephone No. : +33 1 41 17 96 741
Fax No. : +33 1 417 96769
Email: d.levybruhl@invs.sante.fr

France

Dr Isabelle Morer
Afssaps
143/147 Bd.A France
93285 St. Denis Cedex
France

Telephone No. : +33 1 558 73419
Fax No. : +33 1 55 87 3442
Email: isabelle.morer@afssaps.sante.fr

Dr Isabelle Parent
Institut de Veille Sanitaire
12, rue du Val d'Osne
94415 Saint Maurice Cedex
France

Telephone No. : +33 1 41 796 803
Fax No. : +33 417796769
Email address : i.parent@invs.sante.fr

Dr Alice Sarradet
Ministère de la santé et de la
protection sociale
DGS/SD5C
8, Avenue de Ségur
75007 Paris
France

Telephone No. : +33 1 40 565 503
Fax No. : +33 1 40567800
Email: alice.sarradet@sante.gouv.fr

Mme Estelle Sicard
Chargée de Mission à la delegation aux
Affaires européennes et internationals
Ministère de la Santé et de la
Protection sociale
8 Avenue de Ségur
F - 75350 Paris 07SP
France

Telephone No. : +33 (01) 40 56 8113
Fax No. : +33 01 40 56 73 60
Email: Estelle.SICARD@sante.gouv.fr

Prof Catherine Weil-Olivier
Hopital Louis Mourier
178, rue des renouillers
Colombes Cedex
France

Telephone No. : +33 1 47 60 63 58
Fax No. : +33 47 60 63 76
Email: catherine.olivier@lmr.ap-hop-paris.fr

Dr Fabian Wild
Le Centre National de Rererence pour la
Rougeole: CERVI-INSERUM U 404
21 Avenue Tony Garnier
69 365 Lyon Cedex 7
France

Telephone No. : +33 4 372 82 392
Fax No. : +33 4 372 82 391
Email: wild@cervi-lyon.inserm.fr

Germany

Dr Sabine Reiter
Department for Infectious Disease Epidemiology
Robert Koch Institute
Seestrasse 10
D-13353 Berlin
Germany

Telephone No. : +49 30 4547 3461
Fax No. : +49 30 4547 3533
Email address : reiters@rki.de

Dr Anette Siedler
Department For Infectious Disease Epidemiology
Robert Koch Institute
Seestrasse 10
D-13353 Berlin
Germany

Telephone No. : +49 30 4547 3452
Fax No. : +49 30 4547 3514
Email address : siedlera@rki.de

Dr Annedore Tischer
National Reference Centre for Measles, Mumps, Rubella
Robert Koch-Institut
Nordufer 20
D-13353 Berlin
Germany

Telephone No. : +49 3045472516
Fax No. : +49 304547 23 28
Email address : tischera@rki.de

Greece

Dr Takis Panagiotopoulos
Director
Department of Surveillance and Intervention
Hellenic Centre for Infectious Disease Control
6-8 Makedonias St
10433 Athens
Greece

Telephone No. : +30 210 8899000
Fax No. : +30 210 8899120
Email address : tpan@keel.org.gr

Israel

Dr Ella Mendelson
Director
Central Virology Laboratory
Ministry of Health
Chaim Sheba Medical Centre
Tel-Hashomer

Telephone No. : +972 3 530 2421
Fax No. : +972 3 535 0436
Email: ellamen@sheba.health.gov.il

52621, Israel

Ms Ruth Zach
Assistant to the National Head Nurse
the Public Health Service
Ministry of Health
Israel

Fax No. : +972 2 622 8905
Email: zachruth@bezeqint.net

Italy

Dr Marta Ciofi Degli Atti
Reparto Malattie Infettive
Laboratorio di Epidemiologia
e Biostatistica
Istituto Superiore di Sanita
Viale Regina Elena 299
I-00161 Rome
Italy

Telephone No. : +39 06 4990 2273
Fax No. : +39 06 4938 7292
Email address : ciofi@iss.it

Dr Loredana Vellucci
Medical Officer of the
Directorate General for EU
and International Relations
Ministry of Health of Italy
Piazzale dell'Industria 20
00144 Rome
Italy

Telephone No. : + 39 06 5994 3833
Fax No. : + 39 06 5994 3096
Email address : l.vellucci@sanita.it

Netherlands

Dr F. Abbink
National Institute of Public Health and
Environment (RIVM)
PO Box 1
3720 BA Bilthoven
Netherlands

Telephone No. : +31 30 274 3398
Fax No. : +31 30 274 4409
Email address : F.Abbink@rivm.nl

Dr A. Ambler-Huiskes
Inspector for Public Health
Staatstoezicht op de Volksgezondheid
Hoofdinspectie voor de Gezondheidszorg
P.O.Box 16119
NL-2500 BC 's-Gravenhage
Netherlands

Telephone No. : +31 70 3405486
Fax No. : +31 70 3405394
Email address : a.ambler@igz.nl

Dr Robert S. van Binnendijk
National Institute of Public Health and Environment (RIVM)
A.van Leeuwenhoeklaan 9, 3721 MA
Bilthoven
Netherlands

Telephone No. : +31 30 274 3582
Fax No. : +31 30274 4449
Email: rob.van.binnendijk@rivm.nl

Spain

Dr Juan Emilio Echevarria
Laboratorio de referencia
Centro Nacional de Microbiologia
Instituto de salud Carlos III
Carretera de Majadahonda-Pozuelo Km 2
28220 Majadahonda
Madrid
Spain

Telephone No. : +34 91 82 23 676
Fax No. : +34 91 5097966
Email address : eecheva@isciii.es

Dr Isabel Pachon del Amo
Direccion General de Salud Publica
Ministerio de Sanidad y Consumo
Paseo del Prado 18-20
28071 Madrid
Spain

Telephone No. : +34 91 596 41 84
Fax No. : +34 91 596 4195
Email address : ipachon@msc.es

Switzerland

Dr Daniel Koch
Head
Section on Immunization
Swiss Federal Office of Public Health
CH-3003 Bern
Switzerland

Telephone No. : +41 31 322 71 12
Fax No. : +41 31 323 87 95
Email: daniel.koch@bag.admin.ch

Dr Jean-Luc Richard
Scientific Collaborator
Epidemiology and Infectious Diseases Division
Swiss Federal Office of Public Health
Schwarztorstrasse 96
CH-3003 Berne
Switzerland

Telephone No. : +41 31 323 87 06
Fax No. : +41 31 323 87 95
Email: jean-luc.richard@bag.admin.ch

United Kingdom

Dr Brenda Thomas
Medical Technical Officer
Immunisation Division
Health Protection Agency
61, Colindale Avenue
NW9 5EQ London
United Kingdom

Telephone No. : +44 208 200 6868
Fax No. : +44 208 200 7868/74
Email: brenda.thomas@hpa.org.uk

United States of America

Dr Jon Kim Andrus
Pan American Health Organization
525 23 rd Street NW
Washington, DC 20037
United States of America

Telephone No. : +1 202 974 3745
Fax No. : +1 202 974 3635
Email address : andrusjo@paho.org

Dr Gary L. Freed
The Percy and Mary Murphy
Professor of Pediatrics
Director
Division of General Pediatrics
University of Michigan Health System
300 NIB 6E10
Ann Arbor, MI 48109-0456
United States of America

Telephone No. : +734 615 0616
Fax No. : +734 764 2599
Email: gfreed@med.umich.edu

Dr Lance E. Rodewald
National Immunization Program
Centres for Disease Control and
Prevention
1600 Clifton Road, Mailstop E52,
Atlanta Georgia 30333
United States of America

Telephone No: +1 404 639 8208
Fax +1 404 639 8627
E-mail: lar9@cdc.gov

Dr Melinda Wharton
National Immunization Program
Centres for Disease Control
Mailstop E61, 1600 Clifton Road
Atlanta, GA 30333
United States of America

Telephone No: +1 404 639 8206
Fax: +1 404 639 8682
E-mail: mew2@cdc.gov

Temporary Adviser

Mr Mark Reacher
Health Protection Agency, East of England
Institute of Public Health
Robinson Way
Cambridge CB22SR
United Kingdom

Telephone No: +44 01223 762037
Fax: +44 01 223 331865
Email: mreacher@compuserve.com

World Health Organization

Regional Office for Europe

Dr Nedret Emiroglu
Regional Adviser
World Health Organization
Regional office for Europe
8, Scherfigsvej
2100 Copenhagen
Denmark

Telephone No. : +45 39 17 14 50
Fax No. : +45 39 1 718 63
Email address: nem@who.dk

Dr François Xavier Hanon
Technical Officer, Data Management & Analysis
World Health Organization
Regional office for Europe
8, Scherfigsvej
2100 Copenhagen
Denmark

Telephone No. : +45 39 17 14 74
Fax No. : +45 39 17 18 63
Email address: fxh@who.dk

Dr Mick Mulders
Scientist, Coordinator of the
EUR Measles/Rubella Laboratory Network
World Health Organization
Regional office for Europe
8, Scherfigsvej
2100 Copenhagen
Denmark

Telephone No. : +45 39 17 13 87
Fax No. : +45 39 17 18 63
Email address: mmu@who.dk

Dr John Spika
Medical Officer
World Health Organization
Regional office for Europe
8, Scherfigsvej
2100 Copenhagen
Denmark

Telephone No. : +45 39 17 13 79
Fax No. : +45 39 17 18 63
Email address: jsp@who.dk

Meeting assistants

Ms Safura Budukova
Programme Assistant
World Health Organization
Regional office for Europe
8, Scherfigsvej
2100 Copenhagen
Denmark

Telephone No. : +45 39 171497
Fax No. : +45 39 1718 63
Email address: sbu@who.dk

Mr Robert Jensen
Secretary
World Health Organization
Regional office for Europe
8, Scherfigsvej
2100 Copenhagen
Denmark

Telephone No. : +45 39 171347
Fax No. : +45 39 1718 63
Email address: rje@who.dk

Headquarters

Dr David Featherstone
Coordinator
Global Polio Laboratory Network
featherstoned@who.int
Expanded Programme on Immunization
WHO/HQ
av. Appia 20
CH-1211 Geneva 27
Switzerland

Telephone No: +41 227914405
Fax No: +41 22 791 4210
Email address :

Dr Bradley Hersh
Medical Officer
Vaccines and Biologicals
World Health Organization
Avenue Appia 20
CH-1211 Geneva
Switzerland

Telephone No. : +41 22 791 1338
Fax No. : +41 22 791 4193
Email address : hershb@who.int

Annex 2

Meeting Programme

Monday 20th September

8:30 ***Registration & breakfast***

9:00 Opening remarks and meeting objectives
Prof. William Dab, DG Health, France,
Dr. Nedret Emiroglu, Regional Adviser WHO/EURO

9:30 Measles and rubella elimination, regional approaches
a. EURO (Dr. John Spika)
b. PAHO (Dr. Jon Andrus)

10:00 Vaccine coverage
Methods for measuring immunization coverage in the US (Dr. Lance Rodewald, USA)

Experience:
i. Germany – School entry surveys (Dr. Sabine Reiter)
ii. France – 3-year survey cycles (Dr. Daniel Lévy-Bruhl)
iii. Spain – Use of administrative coverage data (Dr. Isabel Pachón)
Discussion

10:50 ***Coffee break***

11:20 Unvaccinated populations
Approaches to reach unvaccinated groups and individuals, addressing concerned parents, anti vaccination groups, missed individuals, e.g. immigrants, gypsies, the poor (Dr. Anneke Ambler-Huiskes, The Netherlands)

Experience:

i. Switzerland – Opposition to vaccination in Germanic countries (Dr. Daniel Koch)
ii. France – Profile of non-vaccinated population (Dr. Marta Balinska)
Discussion

12:10 Surveillance for laboratory-confirmed cases of measles and rubella

Laboratory supported surveillance in countries approaching measles elimination phase - experiences obtained by mandatory notification and sentinel methods (Dr. Annedore Tischer, Germany)

Experience:

i. Canada – Surveillance of lab-confirmed cases of measles and rubella: Canadian experience (Dr. Sam Ratnam)
ii. Belgium – Laboratory services paid for by patient (Dr. Tinne Lernout)
iii. Israel – Laboratory services paid for by health-care provider (Dr. Ella Mendelson)
iv. France – Implementation of laboratory-based measles surveillance in France: involvement of private and public sectors (Dr. Isabelle Parent du Châtelet)

Discussion

13:30 ***Lunch***

14:30 Laboratory-based surveillance

Approaches for assessing the strength of laboratory-based surveillance (Dr. Jean-Luc Richard, Switzerland)

Experience:

i. USA – Methods to assess frequency of testing (Dr. Melinda Wharton)
i. Spain – Laboratory investigation of suspected cases in Spain by the net of laboratories (Dr. Juan Emilio Echevarría)
ii. The Netherlands – Laboratory differentiation of viral exanthemas (Dr. Robert van Binnendijk)

Discussion

15:30 Alternative sampling techniques

Alternative sampling techniques (Dr. Brenda Thomas, UK)

Experience:

i. Switzerland – Use of salivary tests (Dr. Jean-Luc Richard)
ii. WHO – Use of dried blood spots (Dr. David Alexander Featherstone, WHO Geneva)

Discussion

16:30 ***Break***

17:00-19:00 Breakout Groups (discussion on specified topics)

Tuesday 21st September

8:30 Breakout groups (finalise discussion of the group and prepare plenary discussion points)

10:00 ***Break***

10:30 Plenary (Presentations and discussions for each group)

13:15 ***Lunch***

14:00 Break out groups (integration plenary discussions comments to make recommendations)

15:30 ***Break***

16:00 Plenary (presentations and final discussion of the recommendations)

17:30 conclusions/recommendations