IMMUNIZATION OF TOURISTS AND OTHER TRAVELLERS

WORLD HEALTH ORGANIZATION
Regional Office for Europe
COPENHAGEN

TARGET 5

Eliminating seven specific diseases

By the year 2000, there should be no indigenous measles, poliomyelitis, neonatal tetanus, congenital rubella, diphtheria, congenital syphilis or indigenous malaria in the Region.

Index:

35741

EUR/ICP/EPI 025
0046n
ORIGINAL: ENGLISH

IMMUNIZATION OF TOURISTS AND OTHER TRAVELLERS

Report on a Working Group

Venice
11-13 November 1990

1991

EUR/HFA target 5

Note

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CONTENTS

Introduction

The number of tourists and other travellers who cross international borders has increased dramatically in the last decades. In 1988 alone there were approximately 400 million tourists (20 million to developing countries), not counting other travellers such as refugees, diplomats and immigrants. Adequate medical protection of these people by both preventive and curative means has become the focus of tourist health, a new branch of public health and an important part of prevention is proper immunization.

Recognizing this, the WHO Regional Office for Europe and the WHO collaborating centre for tourist health and tourist medicine decided to convene a Working Group on Immunization of Tourists and Travellers in Venice on 11-13 November 1990. The objectives were:

- to review the protection of tourists and other travellers against infectious diseases preventable through immunization;

- to formulate policies; and

- to prepare conclusions and recommendations for the International Tourist Health Association, for tourist industries and for medical professionals.[a]

The meeting was chaired by Professor Boris Velimirovic, Dr Giuliano da Villa served as Vice-chairperson, Dr Robert Chen as Rapporteur and Dr Boris Bytchenko as Secretary.

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[a] This report was distributed to participants in the Third International Conference on Tourist Health (Venice, 14-16 November 1990).

Discussion

The impact of immunization on travellers' health

Few data are available concerning the impact of immunization on travel. This is due to the lack of data on traveller-specific immunization or disease status, and to the difficulty of finding comparable large groups of immunized and unimmunized travellers with the same risk of exposure.

However, the impact can be inferred indirectly from historical examples of outbreaks of diseases that are vaccine-preventable and may affect travellers. The most famous were the measles outbreak in the Faroe Islands, and the 1978 polio outbreak in the Netherlands, Canada and the USA among related people all of whom had religious objections to vaccination. The impact can also be inferred from the decline (or acceleration) in the incidence of a number of vaccine-preventable diseases in developed countries after the introduction of vaccination.

There is no doubt that immunization of travellers could reduce mortality, morbidity, and the cost of treatment, hospitalization and rehabilitation. Immunization has increased the individual sense of security and the fact that protection is available has tremendously extended the geographical range of travel. It has also made it possible for children and particularly older people to travel, increasing their quality of life. It has fostered the development of tourism in areas that otherwise would have been avoided.

Framework for reflection

Vaccines are developed with the goal of substituting vaccine-induced immunity for the immunity developed through infection with the disease. At the same time, the vaccine should prevent the morbidity and mortality caused by the disease, while itself causing minimum adverse effects.

Vaccines are licensed for use after extensive testing for efficacy and safety in phased trials in the laboratory, in animals, and in human volunteers. After the licensing, the WHO Expert Committee on Biological Standardization reaches international consensus on the basic criteria for production and quality control of the vaccine. These WHO standards (or requirements) are continuously reviewed to incorporate new methods based on up-to-date scientific data. They are then used by each national biologicals regulatory agency to ensure the quality of vaccines manufactured in the country.

In general, once a safe and effective vaccine has been developed against a specific disease, the phases in its use are as follows:

1. Pre-vaccination. No vaccination has yet been performed, and incidence of morbidity and mortality due to the disease is high.

2. Increasing coverage. A vaccine is introduced with increasing success. The increase in coverage results in a decline in disease incidence. There is a concomitant low incidence of vaccine-related adverse effects, which increases in proportion to coverage.

3. Lost confidence. Once disease incidence has been reduced, vaccine-related adverse effects may become relatively more prominent. This may lead to a loss of confidence in the vaccine on the public's part, a reduction in vaccine coverage, and a return of higher and even epidemic disease incidence (e.g. pertussis in Japan, Sweden and the United Kingdom; diphtheria in the USSR).

4. Resumption of confidence. With the return of the disease, health authorities may successfully reestablish public confidence in the vaccine. This may result in a return to high vaccine coverage levels and reduction of disease to previous low levels. Because the disease has not been eradicated, however, vaccination must be continued.

5. Eradication. The epidemiological characteristics of certain vaccine-preventable diseases make it possible to eradicate them. Once this eradication can be certified, vaccination can be stopped and the adverse effects due to the vaccine are also eradicated.

For any vaccine-preventable disease, each location (community, city, county, country) in the world can be assigned to a point along the continuum just described. Travel between places which are at different stages implies a change in the risk of contracting a disease. For example, a susceptible person in a highly immunized population may be protected only by the "herd effect" conferred by surrounding immunized individuals. Travelling to a less immunized population, the individual will lose that protection and therefore be at increased risk of disease. Traveller and physician should understand this and the person should be vaccinated prior to travel.

There is great danger, however, if the traveller retains the relatively increased "anti-vaccine" attitude of his/her place of origin (as opposed to the risk-benefit attitude appropriate for the destination) and decides against vaccination. This danger can be aggravated by the fact that psychological attitudes and risk perception change less rapidly than physical movement, and also because many tourists (e.g. those on "adventure" tours) have a romanticized view of the risks they are likely to encounter and may similarly misjudge the risks they run with respect to immunization and vaccine-preventable disease.

Another possiblity is that a visitor from a developed country like Sweden, which stopped pertussis vaccination in 1979, may introduce pertussis to a developing country with high immunization coverage and low disease incidence.

This framework can be used by those interested in tourist health to help them weigh the risks and benefits of immunization for the individual traveller.

Vaccines recommended for all travellers

Several vaccines are safe, effective, inexpensive and protect against diseases with substantial morbidity and mortality. Wherever public acceptance of their use has been widespread, major reductions in morbidity and mortality can be demonstrated, even when improvements in other social conditions are taken into account. These vaccines generally form the core of routine childhood and adult immunization programmes in developed countries. The unacceptability of the developing countries' burden of preventable childhood mortality due to these diseases has also been the impetus behind WHO's Expanded Programme on Immunization (EPI).

These vaccines should therefore be administered to everyone, irrespective of impending travel. However, a health visit prior to travel provides an excellent opportunity to update the traveller's immune status against these diseases. This is especially true for adults, who may otherwise not be easily accessible for preventive measures such as vaccination.

For all children, the vaccines in this category include diphtheria and tetanus toxoids and pertussis vaccine (DTP), polio vaccine (either oral or injectable), measles vaccine, and still, in many countries, BCG. For all adults, the list includes a tetanus and diphtheria toxoid booster dose (Td), polio (inactivated vaccine is generally recommended) and - for those not immune - measles and rubella vaccines.

For certain countries, because of their inclusion in the routine schedule, the following vaccines should also be recommended for travellers: Haemophilus influenza B (HiB) for children, hepatitis B, and mumps for all not immune; for other countries, these vaccines should be considered as recommended for some travellers (see below).

For some vaccines (e.g. DTP and oral polio vaccine (OPV)), several doses of vaccine at appropriate intervals are required for primary immunization. In these cases, the traveller should complete at least the primary series prior to departure. Guidelines for the maximum

acceptable shortening of the interval between doses and other details are published and routinely updated, e.g. in Health information for international travel (see Annex 1 for an example of the United States schedule).

Vaccines recommended for some travellers

The decision as to which other vaccines the traveller should receive depends on a careful weighing of the risks, costs and benefits. Ideally, the factors entering into this appraisal should include:

- any activities or behaviour on the traveller's part which are likely to place him/her at risk;
- the traveller's health and immune status (including past diseases or immunization);
- the incidence of a disease at the destination at the time of travel;
- the mode and ease of transmission of the disease;
- the risk of complications due to the disease;
- the availability and accessiblity of therapy if the disease develops;
- the likely impact of the disease on the original travel plan;
- the likelihood of accidents or other unexpected events that may place the traveller at risk;
- the availability of effective vaccines;
- the compulsory vaccination requirements of the country of destination;
- the relative risk of adverse reactions to the vaccine;
- the cost of the vaccine.

Vaccines recommended for some travellers are: yellow fever, meningococcal, typhoid, rabies, Japanese B encephalitis, BCG, pneumococcal and influenza. Details of dosages, vaccination schedules and contraindications can also be found in the WHO publication International travel and health: vaccination requirements and health advice (1991 edition).

Vaccines generally not recommended for travellers

Cholera vaccine is generally not recommended due to the low level and short duration of immunity induced by current vaccines and the availablity of effective intravenous and (inexpensive) oral rehydration therapy.

Plague vaccine is a similar case due to its high reactogenicity and the availability of chemoprophylaxis, therapy and insecticide. Exceptions are made for people in direct and prolonged contact with animals or fleas in plague-epizootic areas.

Suggested modifications/interpretations

The Working Group suggested modifications or interpretation of the current WHO recommendations for use of the above vaccines for international travel including:

- Japanese B Encephalitis vaccine. The vaccine should be recommended for the following groups of travellers to endemic areas: all visitors during the summer monsoon months; all visitors to rural areas, whatever the length of their visit; and visitors to urban areas staying for more than one month.

- Rabies vaccine.[a] Preexposure vaccination is recommended for travellers who are at increased risk due to their occupation, length of stay and

[a] For postexposure immunization and treatment please refer to Health information for international travel, 1990. Atlanta, GA, US Department of Health and Human Services, 1990.

lifestyle. Vaccination with highly potent and safe rabies vaccine is generally recommended to travellers in rabies-endemic countries who are at risk of exposure and will be more than 24-hours' travel away from a health service.

Data available on interference between antigens

For lack of time, travellers often ask for simultaneous administration of several vaccines at one visit. Researchers have used immunogenicity and reactogenicity as surrogate measures of efficacy and safety respectively. On the basis of their studies of certain vaccine combinations, the following general conclusions can be drawn:

1. Inactivated versus inactivated. No change in immunogenicity and simple additive effect for most reactions.

2. Inactivated versus live. No interference noted except for two combinations - cholera and yellow fever (reciprocally for three weeks); and measles, yellow fever, smallpox and DTP (drop in measles seroconversion versus three live viral vaccines without DTP; three studies examining simultaneous administration of DTP and measles-mumps-rubella (MMR) alone show no interference).

3. Live versus live. Studies based mostly on TOPV and MMR show that: (a) there is mutual competition when these live viral antigens are administered simultaneously, as opposed to when each is administered alone (this has been dealt with by adjusting the relative dose of each component); and (b) live viral antigens induce the formation of interferons for approximately one to two weeks after vaccination, which may interfere with another live viral vaccine administered at this time.

Vaccinators are therefore advised to follow the recommendations on simultaneous administration published in Health information for international travel.[a]

Parties responsible for tourist health

Owing to the extent of international travel, a number of parties share the responsibility for protecting the traveller's welfare. Their efforts should be coordinated under the leadership of national public health authorities in conjunction with WHO.

Parties mainly responsible for tourist health include: the traveller, the traveller's personal physician, travellers' clinics, the public health authorities of the home and destination countries (especially those in which tourism is very important), WHO, vaccine manufacturers, travel agencies, transportation companies (e.g. air and shipping lines), terminal (e.g. airport) authorities, the media and national immunization committees.

A national immunization committee composed of independent experts should formulate each country's recommendations with respect to not only the routine vaccinations, but ideally - for the larger countries - also immunizations for travellers based on WHO recommendations. This committee and its counterparts in professional medical societies and in tourism should collaborate to ensure that the national recommendations are followed.

WHO and/or other international authorities should inform national authorities whenever a country requires vaccinations that are clearly not indicated on the basis of scientific evidence (e.g. cholera).

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[a] Health information for international travel, 1990. Atlanta, GA, US Department of Health and Human Services, 1990.

Dissemination of accurate information

The traveller and the traveller's physician must have accurate and up-to-date information if they are to weigh the risks and benefits of a specific vaccination. A substantial number of factors enter into this appraisal, as indicated, but at present full information on all of them can only be obtained with great difficulty, and it is believed that a relatively small percentage of travellers in fact receive the optimum number and type of vaccinations prior to departure.

Many travellers probably rely instead on anecdotal sources, which may be inaccurate. At the same time, few physicians are likely to have the time or knowledge to counsel the traveller adequately or to tailor the vaccination schedule to specific needs.

However, not much is known about the size of the problem of patient education or what are the best solutions. It was in this area that the Working Group found the greatest need for improvement. Preliminary studies indicate that many travellers are educated and are interested in informing themselves. Educational measures which take advantage of this interest would be especially useful.

Ideally, data on the health and immunization status of the traveller should be readily available in the event of a medical emergency. This is especially important given the large number of elderly people and others with medical problems who travel. The feasiblity and utility of various ways of conveying this information remain to be assessed. The WHO collaborating centre for tourist health and tourist medicine, for instance, is suggesting a "health passport" for each traveller, containing basic health information.

The existing infrastructure which might be used to improve the communication of critical information includes:

- reporting from countries to WHO of routine surveillance data and their dissemination;

- routine sources of information used by the medical practitioner (e.g. general medical journals, weekly epidemiological bulletins, Minitel);

- taped telephone messages on disease- or area-specific recommendations for travellers from authoritative sources;

- a long-term plan to educate primary care physicians on how to prepare the traveller;

- efforts in some countries to encourage physicians to use preventive vaccination for adults.

Recommendations

The Working Group suggests that the WHO collaborating centre for tourist health, the International Tourist Health Association and the World Tourism Organization should create an institutional framework for routine collaboration. The following topics are proposed for action and research.

Health information

- Ways of obtaining more accurate and timely surveillance data on incidence of diseases relevant to tourism.

- Special studies on disease incidence in travellers.

- Special studies on how and why certain people are vaccinated and others not.

- Special studies to examine vaccine efficacy and safety in travellers.

Information dissemination

- Establishment, publication and routine dissemination of scientifically based guidelines and other health advice for travellers.

- Assessment of the different ways of educating the traveller, physicians and the tourist industry.

- Production of up-to-date maps of areas where the traveller is at risk from different vaccine-preventable diseases.

- Development of user-friendly software using analysis to guide decisions on vaccination.

Social and behavioural factors

- Studies on travellers' perceptions of risk.

Vaccines

- Development of vaccines for diseases with a high incidence in developing countries relevant to tourism.

- Development of a vaccine delivery system which combines antigens and minimizes the number of administrations.

Annex 1

UNITED STATES VACCINATION SCHEDULE (example)

Diphtheria and tetanus toxoids and pertussis vaccine (DTP)[a] primary vaccination schedule for children <7 years old

Dose	Routine	Optional for travellers
Primary 1	8 weeks/2 months	6 weeks/1½ months
Interval	(4-8 weeks)	(4 weeks)
Primary 2	16 weeks/4 months	10 weeks/2½ months
Interval	(4-8 weeks)	(4 weeks)
Primary 3	24 weeks/6 months	14 weeks/3½ months
Interval	(9-12 months)	(6 months)
Primary 4	15 months	9½ months

[a] For children with a contraindication to pertussis vaccine, DT should be used instead of DTP.

Oral polio vaccine (OPV) schedule for persons <18 years old

Dose	Routine	Optional for travellers (at birth)
Primary 1	8 weeks/2 months	4 weeks
Interval	(6/8 weeks)	(4 weeks)
Primary 2	16 weeks/4 months	8 weeks
Interval	(8/12 months)[a]	(4 weeks)
Primary 3	15 months[b]	12 weeks
Interval	(>6 weeks)	(>6 weeks)
Booster	4-6 years	18 weeks

[a] An extra dose 6-8 weeks after Primary 2 is optional in high-risk areas.

Enhanced inactivated polio vaccine (eIPV) schedule for persons <18 years old

Dose	Routine	Optional for travellers (at birth)
Primary 1	8 weeks/2 months	6 weeks
Interval	(4/8 weeks)	(4 weeks)
Primary 2	16 weeks/4 months	10 weeks
Interval	(6-12 months)	(4 weeks)
Primary 3	15 months	14 weeks
Interval	(>6 months)	(>6 months)
Booster	4-6 years	9½ months

Measles vaccine schedule for children

Situation	Schedule
Most areas	2 doses (15 months + 4-6 years)
High-risk areas[a]	2 doses (12 months + 4-6 years)
Travellers to endemic or epidemic areas	1 dose (6-14 months[b])

[a] County with:
(1) >5 cases in preschool-aged children in each of the last 5 years.
(2) recent outbreak among unvaccinated preschool-aged children.
(3) large inner-city urban population.

[b] Does not count as part of 2-dose schedule if administered <12 months of age.

BCG vaccine: recommended recipients

Tuberculin skin test-negative children with prolonged exposure:

(a) To infectious pulmonary TB, cannot be removed from exposure and cannot receive long-term preventive therapy

(b) To persons with TB resistant to INH and rifampin

(c) In groups with >1% rate of new infections and usual surveillance and treatment programmes not feasible.

Tetanus and diphtheria (Td) toxoid primary schedule for persons aged 7 years old or over

Dose	Age/interval
Primary 1	First dose
Primary 2	4-8 weeks after first dose*
Primary 3	6-12 months after second dose*
Booster	Every 10 years after last dose

* Prolonging the interval does not require restarting series.

Polio vaccine schedule for adults

Immunization status	Time available	Doses	Interval	Vaccine
Unvaccinated or unknown	Not restricted	3	4-8 weeks between 1 and 2 6-12 months between 2 and 3	eIPV
	4<weeks<8	2	4 weeks between 1 and 2	eIPV
	<4 weeks	1	-	eIPV/OPV
Incomplete	Remaining see Primary			eIPV/OPV
Completed		1	-	eIPV/OPV

Measles vaccination schedule for adults

Setting	Recommendation
Colleges and other post-secondary educational institutions	Documentation of receipt of 2 doses after 1st birthday or adequate evidence of immunity[a]
Medical personnel beginning employment	
Travellers to overseas	

[a] Born prior to 1957 (>95% seropositive), or physician-diagnosed measles, or laboratory evidence of immunity.

Rubella vaccination for adults

Persons considered susceptible unless documentation of:

- previous vaccination ≥1 years of age
- laboratory evidence of immunity.

A single dose of rubella virus vaccine recommended for:

- all susceptible persons
- particularly females
- unless vaccination is contraindicated.

Annex 2

LIST OF WORKING PAPERS AND BACKGROUND DOCUMENTS[a]

Working papers

ICP/EPI 025/6	The impact of immunization on tourist health, Professor B. Velimirovic
ICP/EPI 025/7	Tourist health: a new branch of health services and medicine, Dr W. Pasini
ICP/EPI 025/8	Global status of EPI diseases and success of WHO/EPI programme, Dr H. Zoffmann
ICP/EPI 025/9	WHO information system on other infectious diseases preventable through immunization (yellow fever, viral hepatitis A & B, meningococcal cerebrospinal meningitis (pneumococcal cerebrospinal meningitis, rabies, Japanese encephalitis, rubella, mumps, varicella), Dr J.C. Alary
ICP/EPI 025/10	Policies on immunization of tourists and other travellers (general principles), Dr B. Bytchenko
ICP/EPI 025/11	First-priority immunization highly recommended for all travellers - children: EPI antigens; adults: tetanus and diphtheria toxoid, polio, measles and rubella vaccines, Dr R. Chen

[a] Copies are available from the Communicable Diseases unit, WHO Regional Office for Europe, 8 Scherfigsvej, DK 2100-Copenhagen O.

ICP/EPI 025/12	Yellow fever, Dr V. Gratchev
ICP/EPI 025/13	Hepatitis B, Professor G. Da Villa
ICP/EPI 025/14	Meningococcal infection, Dr A. Fisch
ICP/EPI 025/15	Japanese encephalitis, Dr V. Grachev
ICP/EPI 025/16	Rabies, Dr K. Bögel
ICP/EPI 025/17	Other immunizations of tourists and travellers (influenza, RSV infection), Dr P. Crovari
ICP/EPI 025/18	Other immunizations of tourists and travellers (typhoid fever, cholera, plague), Professor B. Cvjetanovic
ICP/EPI 025/19	Existing vaccine and immunoglobuline supply: quality, efficacy, safety, WHO requirements, availability. An overview, Dr Grachev
ICP/EPI 025/20	Immunization schedules in developing countries, Dr H. Zoffmann
ICP/EPI 025/21	Immunization calendars in developed countries, Dr B. Bytchenko
ICP/EPI 025/22	Data available on interference between antigens, Dr R. Chen
ICP/EPI 025/23	Health passport. A proposal from the WHO collaborating centre for tourist health and tourist medicine, Dr W. Pasini
ICP/EPI 025/24	National advisory body for immunizations of tourists, Professor Fara

Background documents

ICP/CDS 001/c01	Workshop on Communicable Diseases Monitoring, report of a meeting, Rome, 19-21 November 1985
	List of existing vaccines and immunoglobuline supply

Annex 3

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