
Adverse Event

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)
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(T)he available data suggest that vaccines using certain strains may have higher rates of aseptic meningitis, which should be considered when deciding on the introduction of mumps vaccine and selecting specific vaccines. A recent meeting on mumps vaccines (2) recommended that WHO should continue to compile and analyse available data on adverse events related to the use of mumps vaccines. Nevertheless, the meeting concluded that in terms of safety, all available mumps vaccine preparations are acceptable for use in immunization programmes.

(2) Global meeting on mumps vaccine and immunization policy, Geneva, 24-25 May 2001.

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)
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Countries planning to use mumps vaccine during mass campaigns should give special attention to planning, including critical review of the mumps vaccine strain selected, provision of guidelines for monitoring, investigation and management of AEFIs (which tend to be more noticeable in a campaign setting), and training of health workers on expected rates of AEFIs, as well as community advocacy and health education.

BCG

Temperature sensitivity of vaccines

[WHO/IVB/06.10](#)
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The recommended conditions for storing vaccines used in immunization programmes are shown in Appendix 81_1. This diagram also indicates the maximum times and temperatures in each case. At the higher levels of the cold chain, i.e., at national (primary), and regional or province level, OPV must be kept frozen between -15oC and -25oC. Freeze-dried vaccines (i.e., BCG, measles, MMR and yellow fever) may also be kept frozen at -15oC to -25oC if cold chain space permits, but this is neither essential nor recommended. At other levels of the cold chain (intermediate vaccine stores and health facilities), these vaccines should be stored between +2oC and +8oC. All other vaccines should be stored at between +2oC and +8oC at all levels of the cold chain. Liquid formulations of vaccines containing diphtheria, pertussis, tetanus, hepatitis B, Haemophilus influenzae type b, IPV and their combinations should not be frozen.

Contraindications

Mumps virus vaccines (WHO position paper)

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There are few contraindications to mumps vaccination. As with all live attenuated vaccines, mumps vaccine should not be administered to individuals with advanced immune deficiency or immunosuppression. Fetal damage has not been documented when mumps vaccines have been given to pregnant women. Allergy to vaccine components such as neomycin and gelatin is a contraindication to administration of the vaccine.

DPT

Temperature sensitivity of vaccines

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Diphtheria

Temperature sensitivity of vaccines

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General

Thermostability of vaccines

[WHO/GPV/98.07](#)

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The WHO thermostability requirements for mumps and rubella vaccines are similar to those for measles vaccine. At least three containers of monovalent or MMR vaccine are tested by incubation at 37C for seven days, at the end of which each monovalent vaccine or individual vaccine component is titrated in PFUs or CCID50 after selective neutralization, as necessary, of the other components. The geometric mean infectious virus titre must equal or exceed the required minimum number of infective units per human dose (3 log10), and the geometric mean virus titre must not have decreased by more than 1 log10 infective units during incubation.

Measles vaccines (WHO position paper)

Mumps-containing measles vaccine (MMR) is generally not recommended for large-scale measles SIAs in countries with limited resources.

[WER 2004, vol. 79, 14, pp 130-142](#)
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Mumps virus vaccines (WHO position paper)

Large-scale mumps vaccination is recommended in countries with an efficient childhood vaccination programme and sufficient resources to maintain high-level vaccination coverage, and where reduction of mumps is a public health priority. Because WHO considers measles elimination and control of congenital rubella syndrome to be higher priorities than mumps control, it recommends that the introduction of mumps immunization should be considered only in countries that have or are establishing adequate vaccination programmes for measles elimination and control of the congenital rubella syndrome. In countries which decide to use mumps vaccine, the combination of mumps vaccine with measles and rubella vaccines is thus recommended.

[WER 2001, vol. 76, 45, pp 346-356](#)
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National decisions to implement large-scale mumps vaccination should be based on careful cost-benefit analyses, including comparative analyses of mumps control versus control of other vaccine-preventable diseases in the country.

Immunization in practice: a practical resource guide for Health workers 2004 update _____ Module 1: Target diseases

Mumps vaccine should be given in combination with measles and rubella vaccines (MMR).

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Measles vaccines (WHO position paper)

Where measles vaccine has been combined with rubella vaccine (MR) or mumps and rubella vaccine (MMR), the protective immune response to the individual components remains unchanged. The use of such combined vaccines is logistically and programmatically sound and is recommended in areas where the disease burden of mumps and rubella disease burden is high, when the vaccine is affordable and, in the case of rubella, where vaccine coverage rates can be sustained at >80%.

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WHO recommended standards for surveillance of selected vaccine-preventable diseases

In countries achieving high routine mumps coverage and with low incidence that includes periodic outbreaks, surveillance should be used to identify high-risk populations and predict and prevent potential outbreaks. Countries having the objective of completely interrupting mumps transmission require intensive case-based surveillance to detect, investigate and confirm every suspect mumps case in the community.

[WHO/V&B/03.01](#)
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WHO recommended standards for surveillance of selected vaccine-preventable diseases

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Recommended types of surveillance for mumps:

1) When mumps is endemic, only routine monthly reporting of aggregated data of clinical mumps cases is recommended by district, age group and immunization status. Only outbreaks (not each case) should be investigated.

2) When a high level of control is achieved (i.e. sustained high vaccine coverage), case-based surveillance should be conducted and every case should be reported and investigated immediately (and also included in the weekly or monthly reporting system). Suspected mumps outbreaks should be confirmed by conducting laboratory investigation on 5-10 cases only. In specific situations, viral isolation can be attempted to differentiate meningitis cases that could be related to the wild virus, the vaccine strain or other factors.

3) Designated reporting sites at all levels should report at a specified frequency (e.g. weekly or monthly) even if there are zero cases (often referred to as zero reporting).

WHO recommended standards for surveillance of selected vaccine-preventable diseases

[WHO/V&B/03.01](#)

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Where (mumps) vaccine is used and high coverage is achieved the monitoring of vaccine-associated mumps meningitis and its differentiation from meningitis due to other causes can be an important issue. The monitoring of mumps meningitis, whether related to vaccine or natural disease, can be integrated into overall meningitis surveillance activities.

The vast majority of mumps vaccine is used in combination with measles and rubella vaccines (MMR), and surveillance strategies for mumps should take surveillance for measles, rubella and congenital rubella syndrome into consideration.

Global Advisory Committee on Vaccine Safety, 34 December 2003

[WER 2004, vol. 79, 3, pp 16-20](#)

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GACVS has recommended to WHO that an international reference laboratory for mumps virus isolates from vaccinees should be established.

Temperature sensitivity of vaccines

[WHO/IVB/06.10](#)

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Temperature sensitivity of vaccines

[WHO/IVB/06.10](#)

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There is a serious risk when reconstituted (measles, mumps, and rubella vaccines and their combinations are) stored at any temperature for longer than six hours or above 8C for any period. This is not only because of the lack of potency, but also because of the possibility of contamination of the product, which could cause serious adverse consequences in those being vaccinated. When used, measles vaccine should be protected from elevated temperature and from light (light may inactivate the virus). Reconstituted vaccines must be discarded at the end of each immunization session and should NEVER be kept for use in subsequent sessions.

After reconstitution, measles and MMR vaccine rapidly lose their potency when kept at temperatures above 2-8C. Reconstituted measles and MMR vaccines should be kept cold during immunization procedures, must be discarded at the end of each immunization session and must never be kept for use in subsequent sessions.

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)

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As insufficient childhood vaccination coverage may result in an epidemiological shift in the incidence of mumps to older age groups, potentially leading to more serious disease burden than occurred before immunization was introduced, childhood mumps vaccination should aim at an 80% coverage rate, or more.

Mumps virus vaccines (WHO position paper)

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In the context of a national mumps immunization programme, WHO recommends making mumps a notifiable disease.

Mumps virus vaccines (WHO position paper)

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If a large proportion of the population remains seronegative for mumps, care should be taken to vaccinate adults considered to be at special risk.

Mumps virus vaccines (WHO position paper)

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Assumed susceptible persons may be vaccinated (with mumps vaccine) without prior laboratory testing.

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)

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Mumps vaccines are recommended for use in a 1-dose schedule, given at age 12-18 months.

(Page 355) Control of mumps can be achieved through high routine coverage with an effective mumpscontaining vaccine administered at age 12-18 months.

Mumps virus vaccines (WHO position paper)

The (mumps) vaccines are cold-chain dependent, and should be protected from light both before and after reconstitution. Reconstituted vaccine must be discarded if not used within 6 hours.

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Mumps virus vaccines (WHO position paper)

There are few contraindications to mumps vaccination. As with all live attenuated vaccines, mumps vaccine should not be administered to individuals with advanced immune deficiency or immunosuppression. Fetal damage has not been documented when mumps vaccines have been given to pregnant women. Allergy to vaccine components such as neomycin and gelatin is a contraindication to administration of the vaccine.

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Mumps virus vaccines (WHO position paper)

WHO requirements do not specify the minimum amount of (mumps) vaccine virus that 1 human dose should contain. Rather, this is determined by the national regulatory authority of the country where the vaccine is produced.

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Mumps virus vaccines (WHO position paper)

Primary mumps vaccination, especially in the recommended combination with rubella and measles vaccines, is easily adapted to the national vaccination programmes and does not interfere significantly with simultaneously-administered vaccines.

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Mumps virus vaccines (WHO position paper)

The decision to introduce mumps immunization should be based on an assessment of the disease burden of mumps, the efficacy and adverse-event characteristics of the vaccine, the cost of the prevention programme and other disease-prevention priorities. In view of the moderate morbidity and low mortality of this disease, information on the burden (including socioeconomic impact) of mumps is essential when deciding on the priority of mumps vaccination in national immunization programmes. With respect to efficacy, public health authorities should guarantee that mumps vaccine preparations recommended for use in the national immunization programme have an established record of effectiveness. Vaccines that are not effective should not be used.

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Mumps virus vaccines (WHO position paper)

Due to its known low effectiveness, the Rubini-strain (mumps) vaccine should not be used in national immunization programmes. Persons previously immunized with the Rubini-strain vaccine should receive a dose of an effective mumps vaccine to ensure protection.

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Mumps virus vaccines (WHO position paper)

(T)he available data suggest that vaccines using certain strains may have higher rates of aseptic meningitis, which should be considered when deciding on the introduction of mumps vaccine and selecting specific vaccines. A recent meeting on mumps vaccines (2) recommended that WHO should continue to compile and analyse available data on adverse events related to the use of mumps vaccines. Nevertheless, the meeting concluded that in terms of safety, all available mumps vaccine preparations are acceptable for use in immunization programmes.

(2) Global meeting on mumps vaccine and immunization policy, Geneva, 24-25 May 2001.

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Mumps virus vaccines (WHO position paper)

Introduction of routine mumps immunization should be prioritized along with other potential prevention options. Introduction of mumps vaccine into national childhood immunization programmes should be considered only in countries that have or are establishing adequate vaccination programmes for measles elimination and control of the congenital rubella syndrome.

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Mumps virus vaccines (WHO position paper)

Countries considering inclusion of mumps vaccination into their national immunization programme should set disease-control targets (elimination or control) and design their immunization strategies accordingly.

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Mumps virus vaccines (WHO position paper)

The addition of mumps vaccine to the measles and rubella vaccination programmes using the MMR combined vaccine is logistically sound, and the MMR combination is strongly encouraged where affordable and where vaccine supply is sufficient.

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Mumps virus vaccines (WHO position paper)

Strategies to achieve mumps elimination may include: (1) high (>90%) coverage with a first dose of vaccine containing mumps at the age of 12-18 months; (2) ensuring a second opportunity for vaccination; and (3) conducting a catch-up immunization of susceptible cohorts.

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Mumps virus vaccines (WHO position paper)

Countries planning to use mumps vaccine during mass campaigns should give special attention to planning, including critical review of the mumps vaccine strain selected, provision of guidelines for monitoring, investigation and management of AEFIs (which tend to be more noticeable in a campaign setting), and training of health workers on expected rates of AEFIs, as well as community advocacy and health education.

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Mumps virus vaccines (WHO position paper)

A second (mumps) opportunity is not required in countries where coverage with the first dose is sufficiently high (i.e. > 95%). If a second opportunity is required, it could be administered through a second routine dose, or by implementing periodical catch-up campaigns. Finally, if an initial catch-up campaign is implemented, the target age group should be determined according to mumps susceptibility. In most unvaccinated populations, most children acquire mumps infections before the age of 10 years.

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Conclusions and recommendations from the Strategic Advisory Group of Experts (SAGE) - 10-11 April 2006

SAGE requested that the WHO position paper on mumps vaccines be revised, drawing on the conclusions and recommendations from the recent consultation on use of mumps vaccine in the Eastern Mediterranean Region. The revision should take into consideration the accumulating global experience that high coverage with 2 doses of measlesmumpsrubella vaccine (MMR) is required to effectively prevent mumps outbreaks.

[WER 2006, vol. 81, 21, pp 210-220](#)
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Conclusions and recommendations from the Strategic Advisory Group of Experts (SAGE) - 10-11 April 2006

Additional information on the safety of different mumps vaccine strains is available from country experiences with use of mumps vaccine in mass campaigns and routine settings. These data should be reviewed by the GACVS and the resulting conclusions included in the revision of the WHO mumps position paper.

[WER 2006, vol. 81, 21, pp 210-220](#)
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Conclusions and recommendations from the Strategic Advisory Group of Experts (SAGE) - 10-11 April 2006

Surveillance of mumps should be strengthened to include laboratory confirmation of mumps cases, virus genotyping and careful outbreak investigations.

[WER 2006, vol. 81, 21, pp 210-220](#)
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HIV/AIDS and immunosuppression

Mumps virus vaccines (WHO position paper)

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Hepatitis B

Temperature sensitivity of vaccines

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Hib

Temperature sensitivity of vaccines

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Immunization Coverage

Mumps virus vaccines (WHO position paper)

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MMR

Measles vaccines (WHO position paper)

[WER 2004, vol. 79, 14, pp 130-142](#)
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Mumps-containing measles vaccine (MMR) is generally not recommended for large-scale measles SIAs in countries with limited resources.

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)
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Large-scale mumps vaccination is recommended in countries with an efficient childhood vaccination programme and sufficient resources to maintain high-level vaccination coverage, and where reduction of mumps is a public health priority. Because WHO considers measles elimination and control of congenital rubella syndrome to be higher priorities than mumps control, it recommends that the introduction of mumps immunization should be considered only in countries that have or are establishing adequate vaccination programmes for measles elimination and control of the congenital rubella syndrome. In countries which decide to use mumps vaccine, the combination of mumps vaccine with measles and rubella vaccines is thus recommended.

National decisions to implement large-scale mumps vaccination should be based on careful cost-benefit analyses, including comparative analyses of mumps control versus control of other vaccine-preventable diseases in the country.

Immunization in practice: a practical resource guide for Health workers 2004 update_____Module 1: Target diseases

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Measles vaccines (WHO position paper)

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Where measles vaccine has been combined with rubella vaccine (MR) or mumps and rubella vaccine (MMR), the protective immune response to the individual components remains unchanged. The use of such combined vaccines is logistically and programmatically sound and is recommended in areas where the disease burden of mumps and rubella disease burden is high, when the vaccine is affordable and, in the case of rubella, where vaccine coverage rates can be sustained at >80%.

WHO recommended standards for surveillance of selected vaccine-preventable diseases

[WHO/V&B/03.01](#)
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The vast majority of mumps vaccine is used in combination with measles and rubella vaccines (MMR), and surveillance strategies for mumps should take surveillance for measles, rubella and congenital rubella syndrome into consideration.

Temperature sensitivity of vaccines

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Temperature sensitivity of vaccines

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There is a serious risk when reconstituted (measles, mumps, and rubella vaccines and their combinations are) stored at any temperature for longer than six hours or above 8C for any period. This is not only because of the lack of potency, but also because of the possibility of contamination of the product, which could cause serious adverse consequences in those being vaccinated. When used, measles vaccine should be protected from elevated temperature and from light (light may inactivate the virus). Reconstituted vaccines must be discarded at the end of each immunization session and should NEVER be kept for use in subsequent sessions.

After reconstitution, measles and MMR vaccine rapidly lose their potency when kept at temperatures above 2-8C. Reconstituted measles and MMR vaccines should be kept cold during immunization procedures, must be discarded at the end of each immunization session and must never be kept for use in subsequent sessions.

Mumps virus vaccines (WHO position paper)

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Measles

Measles vaccines (WHO position paper)

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Temperature sensitivity of vaccines

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Meningococcal

Temperature sensitivity of vaccines

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New Vaccines

Measles vaccines (WHO position paper)

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Measles vaccines (WHO position paper)

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Mumps virus vaccines (WHO position paper)

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Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)
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Introduction of routine mumps immunization should be prioritized along with other potential prevention options. Introduction of mumps vaccine into national childhood immunization programmes should be considered only in countries that have or are establishing adequate vaccination programmes for measles elimination and control of the congenital rubella syndrome.

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)
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The addition of mumps vaccine to the measles and rubella vaccination programmes using the MMR combined vaccine is logistically sound, and the MMR combination is strongly encouraged where affordable and where vaccine supply is sufficient.

Outbreak Control

WHO recommended standards for surveillance of selected vaccine-preventable diseases

[WHO/V&B/03.01](#)
page 19

Recommended types of surveillance for mumps:

- 1) When mumps is endemic, only routine monthly reporting of aggregated data of clinical mumps cases is recommended by district, age group and immunization status. Only outbreaks (not each case) should be investigated.
- 2) When a high level of control is achieved (i.e. sustained high vaccine coverage), case-based surveillance should be conducted and every case should be reported and investigated immediately (and also included in the weekly or monthly reporting system). Suspected mumps outbreaks should be confirmed by conducting laboratory investigation on 5-10 cases only. In specific situations, viral isolation can be attempted to differentiate meningitis cases that could be related to the wild virus, the vaccine strain or other factors.
- 3) Designated reporting sites at all levels should report at a specified frequency (e.g. weekly or monthly) even if there are zero cases (often referred to as zero reporting).

Pentavalent

Temperature sensitivity of vaccines

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page 2

The recommended conditions for storing vaccines used in immunization programmes are shown in Appendix 81_1. This diagram also indicates the maximum times and temperatures in each case. At the higher levels of the cold chain, i.e., at national (primary), and regional or province level, OPV must be kept frozen between -15oC and -25oC. Freeze-dried vaccines (i.e., BCG, measles, MMR and yellow fever) may also be kept frozen at -15oC to -25oC if cold chain space permits, but this is neither essential nor recommended. At other levels of the cold chain (intermediate vaccine stores and health facilities), these vaccines should be stored between +2oC and +8oC. All other vaccines should be stored at between +2oC and +8oC at all levels of the cold chain. Liquid formulations of vaccines containing diphtheria, pertussis, tetanus, hepatitis B, Haemophilus influenzae type b, IPV and their combinations should not be frozen.

Policy

Thermostability of vaccines

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The WHO thermostability requirements for mumps and rubella vaccines are similar to those for measles vaccine. At least three containers of monovalent or MMR vaccine are tested by incubation at 37C for seven days, at the end of which each monovalent vaccine or individual vaccine component is titrated in PFUs or CCID50 after selective neutralization, as necessary, of the other components. The geometric mean infectious virus titre must equal or exceed the required minimum number of infective units per human dose (3 log₁₀), and the geometric mean virus titre must not have decreased by more than 1 log₁₀ infective units during incubation.

Measles vaccines (WHO position paper)

[WER 2004, vol. 79, 14, pp 130-142](#)
page 138

Mumps-containing measles vaccine (MMR) is generally not recommended for large-scale measles SIAs in countries with limited resources.

Mumps virus vaccines (WHO position paper)

Large-scale mumps vaccination is recommended in countries with an efficient childhood vaccination programme and sufficient resources to maintain high-level vaccination coverage, and where reduction of mumps is a public health priority. Because WHO considers measles elimination and control of congenital rubella syndrome to be higher priorities than mumps control, it recommends that the introduction of mumps immunization should be considered only in countries that have or are establishing adequate vaccination programmes for measles elimination and control of the congenital rubella syndrome. In countries which decide to use mumps vaccine, the combination of mumps vaccine with measles and rubella vaccines is thus recommended.

National decisions to implement large-scale mumps vaccination should be based on careful cost-benefit analyses, including comparative analyses of mumps control versus control of other vaccine-preventable diseases in the country.

Immunization in practice: a practical resource guide for Health workers 2004 update_____Module 1: Target diseases

Mumps vaccine should be given in combination with measles and rubella vaccines (MMR).

Measles vaccines (WHO position paper)

Where measles vaccine has been combined with rubella vaccine (MR) or mumps and rubella vaccine (MMR), the protective immune response to the individual components remains unchanged. The use of such combined vaccines is logistically and programmatically sound and is recommended in areas where the disease burden of mumps and rubella disease burden is high, when the vaccine is affordable and, in the case of rubella, where vaccine coverage rates can be sustained at >80%.

WHO recommended standards for surveillance of selected vaccine-preventable diseases

In countries achieving high routine mumps coverage and with low incidence that includes periodic outbreaks, surveillance should be used to identify high-risk populations and predict and prevent potential outbreaks. Countries having the objective of completely interrupting mumps transmission require intensive case-based surveillance to detect, investigate and confirm every suspect mumps case in the community.

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WHO recommended standards for surveillance of selected vaccine-preventable diseases

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Recommended types of surveillance for mumps:

1) When mumps is endemic, only routine monthly reporting of aggregated data of clinical mumps cases is recommended by district, age group and immunization status. Only outbreaks (not each case) should be investigated.

2) When a high level of control is achieved (i.e. sustained high vaccine coverage), case-based surveillance should be conducted and every case should be reported and investigated immediately (and also included in the weekly or monthly reporting system). Suspected mumps outbreaks should be confirmed by conducting laboratory investigation on 5-10 cases only. In specific situations, viral isolation can be attempted to differentiate meningitis cases that could be related to the wild virus, the vaccine strain or other factors.

3) Designated reporting sites at all levels should report at a specified frequency (e.g. weekly or monthly) even if there are zero cases (often referred to as zero reporting).

WHO recommended standards for surveillance of selected vaccine-preventable diseases

[WHO/V&B/03.01](#)

page 21

Where (mumps) vaccine is used and high coverage is achieved the monitoring of vaccine-associated mumps meningitis and its differentiation from meningitis due to other causes can be an important issue. The monitoring of mumps meningitis, whether related to vaccine or natural disease, can be integrated into overall meningitis surveillance activities.

The vast majority of mumps vaccine is used in combination with measles and rubella vaccines (MMR), and surveillance strategies for mumps should take surveillance for measles, rubella and congenital rubella syndrome into consideration.

Temperature sensitivity of vaccines

[WHO/IVB/06.10](#)

page 2

The recommended conditions for storing vaccines used in immunization programmes are shown in Appendix 81_1. This diagram also indicates the maximum times and temperatures in each case. At the higher levels of the cold chain, i.e., at national (primary), and regional or province level, OPV must be kept frozen between -15°C and -25°C. Freeze-dried vaccines (i.e., BCG, measles, MMR and yellow fever) may also be kept frozen at -15°C to -25°C if cold chain space permits, but this is neither essential nor recommended. At other levels of the cold chain (intermediate vaccine stores and health facilities), these vaccines should be stored between +2°C and +8°C. All other vaccines should be stored at between +2°C and +8°C at all levels of the cold chain. Liquid formulations of vaccines containing diphtheria, pertussis, tetanus, hepatitis B, Haemophilus influenzae type b, IPV and their combinations should not be frozen.

Temperature sensitivity of vaccines

[WHO/IVB/06.10](#)

page 27

There is a serious risk when reconstituted (measles, mumps, and rubella vaccines and their combinations are) stored at any temperature for longer than six hours or above 8C for any period. This is not only because of the lack of potency, but also because of the possibility of contamination of the product, which could cause serious adverse consequences in those being vaccinated. When used, measles vaccine should be protected from elevated temperature and from light (light may inactivate the virus). Reconstituted vaccines must be discarded at the end of each immunization session and should NEVER be kept for use in subsequent sessions.

After reconstitution, measles and MMR vaccine rapidly lose their potency when kept at temperatures above 2-8C. Reconstituted measles and MMR vaccines should be kept cold during immunization procedures, must be discarded at the end of each immunization session and must never be kept for use in subsequent sessions.

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)

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As insufficient childhood vaccination coverage may result in an epidemiological shift in the incidence of mumps to older age groups, potentially leading to more serious disease burden than occurred before immunization was introduced, childhood mumps vaccination should aim at an 80% coverage rate, or more.

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)

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In the context of a national mumps immunization programme, WHO recommends making mumps a notifiable disease.

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)

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If a large proportion of the population remains seronegative for mumps, care should be taken to vaccinate adults considered to be at special risk.

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)

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Assumed susceptible persons may be vaccinated (with mumps vaccine) without prior laboratory testing.

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)

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Mumps vaccines are recommended for use in a 1-dose schedule, given at age 12-18 months.

(Page 355) Control of mumps can be achieved through high routine coverage with an effective mumpscontaining vaccine administered at age 12-18 months.

Mumps virus vaccines (WHO position paper)

The (mumps) vaccines are cold-chain dependent, and should be protected from light both before and after reconstitution. Reconstituted vaccine must be discarded if not used within 6 hours.

[WER 2001, vol. 76, 45, pp 346-356](#)
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Mumps virus vaccines (WHO position paper)

There are few contraindications to mumps vaccination. As with all live attenuated vaccines, mumps vaccine should not be administered to individuals with advanced immune deficiency or immunosuppression. Fetal damage has not been documented when mumps vaccines have been given to pregnant women. Allergy to vaccine components such as neomycin and gelatin is a contraindication to administration of the vaccine.

[WER 2001, vol. 76, 45, pp 346-356](#)
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Mumps virus vaccines (WHO position paper)

WHO requirements do not specify the minimum amount of (mumps) vaccine virus that 1 human dose should contain. Rather, this is determined by the national regulatory authority of the country where the vaccine is produced.

[WER 2001, vol. 76, 45, pp 346-356](#)
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Mumps virus vaccines (WHO position paper)

Primary mumps vaccination, especially in the recommended combination with rubella and measles vaccines, is easily adapted to the national vaccination programmes and does not interfere significantly with simultaneously-administered vaccines.

[WER 2001, vol. 76, 45, pp 346-356](#)
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Mumps virus vaccines (WHO position paper)

The decision to introduce mumps immunization should be based on an assessment of the disease burden of mumps, the efficacy and adverse-event characteristics of the vaccine, the cost of the prevention programme and other disease-prevention priorities. In view of the moderate morbidity and low mortality of this disease, information on the burden (including socioeconomic impact) of mumps is essential when deciding on the priority of mumps vaccination in national immunization programmes. With respect to efficacy, public health authorities should guarantee that mumps vaccine preparations recommended for use in the national immunization programme have an established record of effectiveness. Vaccines that are not effective should not be used.

[WER 2001, vol. 76, 45, pp 346-356](#)
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Mumps virus vaccines (WHO position paper)

Due to its known low effectiveness, the Rubini-strain (mumps) vaccine should not be used in national immunization programmes. Persons previously immunized with the Rubini-strain vaccine should receive a dose of an effective mumps vaccine to ensure protection.

[WER 2001, vol. 76, 45, pp 346-356](#)
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Mumps virus vaccines (WHO position paper)

(T)he available data suggest that vaccines using certain strains may have higher rates of aseptic meningitis, which should be considered when deciding on the introduction of mumps vaccine and selecting specific vaccines. A recent meeting on mumps vaccines (2) recommended that WHO should continue to compile and analyse available data on adverse events related to the use of mumps vaccines. Nevertheless, the meeting concluded that in terms of safety, all available mumps vaccine preparations are acceptable for use in immunization programmes.

(2) Global meeting on mumps vaccine and immunization policy, Geneva, 24-25 May 2001.

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Mumps virus vaccines (WHO position paper)

Introduction of routine mumps immunization should be prioritized along with other potential prevention options. Introduction of mumps vaccine into national childhood immunization programmes should be considered only in countries that have or are establishing adequate vaccination programmes for measles elimination and control of the congenital rubella syndrome.

[WER 2001, vol. 76, 45, pp 346-356](#)
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Mumps virus vaccines (WHO position paper)

Countries considering inclusion of mumps vaccination into their national immunization programme should set disease-control targets (elimination or control) and design their immunization strategies accordingly.

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Mumps virus vaccines (WHO position paper)

The addition of mumps vaccine to the measles and rubella vaccination programmes using the MMR combined vaccine is logistically sound, and the MMR combination is strongly encouraged where affordable and where vaccine supply is sufficient.

[WER 2001, vol. 76, 45, pp 346-356](#)
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Mumps virus vaccines (WHO position paper)

Strategies to achieve mumps elimination may include: (1) high (>90%) coverage with a first dose of vaccine containing mumps at the age of 12-18 months; (2) ensuring a second opportunity for vaccination; and (3) conducting a catch-up immunization of susceptible cohorts.

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Mumps virus vaccines (WHO position paper)

Countries planning to use mumps vaccine during mass campaigns should give special attention to planning, including critical review of the mumps vaccine strain selected, provision of guidelines for monitoring, investigation and management of AEFIs (which tend to be more noticeable in a campaign setting), and training of health workers on expected rates of AEFIs, as well as community advocacy and health education.

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Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)
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A second (mumps) opportunity is not required in countries where coverage with the first dose is sufficiently high (i.e. > 95%). If a second opportunity is required, it could be administered through a second routine dose, or by implementing periodical catch-up campaigns. Finally, if an initial catch-up campaign is implemented, the target age group should be determined according to mumps susceptibility. In most unvaccinated populations, most children acquire mumps infections before the age of 10 years.

Conclusions and recommendations from the Strategic Advisory Group of Experts (SAGE) - 10-11 April 2006

[WER 2006, vol. 81, 21, pp 210-220](#)
page 214

SAGE requested that the WHO position paper on mumps vaccines be revised, drawing on the conclusions and recommendations from the recent consultation on use of mumps vaccine in the Eastern Mediterranean Region. The revision should take into consideration the accumulating global experience that high coverage with 2 doses of measlesmumpsrubella vaccine (MMR) is required to effectively prevent mumps outbreaks.

Polio

Temperature sensitivity of vaccines

[WHO/IVB/06.10](#)
page 2

The recommended conditions for storing vaccines used in immunization programmes are shown in Appendix 81_1. This diagram also indicates the maximum times and temperatures in each case. At the higher levels of the cold chain, i.e., at national (primary), and regional or province level, OPV must be kept frozen between -15oC and -25oC. Freeze-dried vaccines (i.e., BCG, measles, MMR and yellow fever) may also be kept frozen at -15oC to -25oC if cold chain space permits, but this is neither essential nor recommended. At other levels of the cold chain (intermediate vaccine stores and health facilities), these vaccines should be stored between +2oC and +8oC. All other vaccines should be stored at between +2oC and +8oC at all levels of the cold chain. Liquid formulations of vaccines containing diphtheria, pertussis, tetanus, hepatitis B, Haemophilus influenzae type b, IPV and their combinations should not be frozen.

Pregnant Women

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)
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There are few contraindications to mumps vaccination. As with all live attenuated vaccines, mumps vaccine should not be administered to individuals with advanced immune deficiency or immunosuppression. Fetal damage has not been documented when mumps vaccines have been given to pregnant women. Allergy to vaccine components such as neomycin and gelatin is a contraindication to administration of the vaccine.

Program Management

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)
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Countries considering inclusion of mumps vaccination into their national immunization programme should set disease-control targets (elimination or control) and design their immunization strategies accordingly.

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)
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Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)
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Countries planning to use mumps vaccine during mass campaigns should give special attention to planning, including critical review of the mumps vaccine strain selected, provision of guidelines for monitoring, investigation and management of AEFIs (which tend to be more noticeable in a campaign setting), and training of health workers on expected rates of AEFIs, as well as community advocacy and health education.

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Rubella

Thermostability of vaccines

[WHO/GPV/98.07](#)
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The WHO thermostability requirements for mumps and rubella vaccines are similar to those for measles vaccine. At least three containers of monovalent or MMR vaccine are tested by incubation at 37C for seven days, at the end of which each monovalent vaccine or individual vaccine component is titrated in PFUs or CCID50 after selective neutralization, as necessary, of the other components. The geometric mean infectious virus titre must equal or exceed the required minimum number of infective units per human dose (3 log₁₀), and the geometric mean virus titre must not have decreased by more than 1 log₁₀ infective units during incubation.

Measles vaccines (WHO position paper)

Where measles vaccine has been combined with rubella vaccine (MR) or mumps and rubella vaccine (MMR), the protective immune response to the individual components remains unchanged. The use of such combined vaccines is logistically and programmatically sound and is recommended in areas where the disease burden of mumps and rubella disease burden is high, when the vaccine is affordable and, in the case of rubella, where vaccine coverage rates can be sustained at >80%.

[WER 2004, vol. 79, 14, pp 130-142](#)
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Temperature sensitivity of vaccines

The recommended conditions for storing vaccines used in immunization programmes are shown in Appendix 81_1. This diagram also indicates the maximum times and temperatures in each case. At the higher levels of the cold chain, i.e., at national (primary), and regional or province level, OPV must be kept frozen between -15oC and -25oC. Freeze-dried vaccines (i.e., BCG, measles, MMR and yellow fever) may also be kept frozen at -15oC to -25oC if cold chain space permits, but this is neither essential nor recommended. At other levels of the cold chain (intermediate vaccine stores and health facilities), these vaccines should be stored between +2oC and +8oC. All other vaccines should be stored at between +2oC and +8oC at all levels of the cold chain. Liquid formulations of vaccines containing diphtheria, pertussis, tetanus, hepatitis B, Haemophilus influenzae type b, IPV and their combinations should not be frozen.

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page 2

Temperature sensitivity of vaccines

There is a serious risk when reconstituted (measles, mumps, and rubella vaccines and their combinations are) stored at any temperature for longer than six hours or above 8C for any period. This is not only because of the lack of potency, but also because of the possibility of contamination of the product, which could cause serious adverse consequences in those being vaccinated. When used, measles vaccine should be protected from elevated temperature and from light (light may inactivate the virus). Reconstituted vaccines must be discarded at the end of each immunization session and should NEVER be kept for use in subsequent sessions.

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After reconstitution, measles and MMR vaccine rapidly lose their potency when kept at temperatures above 2-8C. Reconstituted measles and MMR vaccines should be kept cold during immunization procedures, must be discarded at the end of each immunization session and must never be kept for use in subsequent sessions.

SAGE

Global Advisory Committee on Vaccine Safety, 34 December 2003

GACVS has recommended to WHO that an international reference laboratory for mumps virus isolates from vaccinees should be established.

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SAGE - recommend to WHO

Conclusions and recommendations from the Strategic Advisory Group of Experts (SAGE) - 10-11 April 2006

[WER 2006, vol. 81, 21, pp 210-220](#)
page 214

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Conclusions and recommendations from the Strategic Advisory Group of Experts (SAGE) - 10-11 April 2006

[WER 2006, vol. 81, 21, pp 210-220](#)
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Additional information on the safety of different mumps vaccine strains is available from country experiences with use of mumps vaccine in mass campaigns and routine settings. These data should be reviewed by the GACVS and the resulting conclusions included in the revision of the WHO mumps position paper.

Schedule

Immunization in practice: a practical resource guide for Health workers 2004 update _____ Module 1: Target diseases

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Mumps vaccine should be given in combination with measles and rubella vaccines (MMR).

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)
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If a large proportion of the population remains seronegative for mumps, care should be taken to vaccinate adults considered to be at special risk.

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)
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Mumps vaccines are recommended for use in a 1-dose schedule, given at age 12-18 months.

(Page 355) Control of mumps can be achieved through high routine coverage with an effective mumpscontaining vaccine administered at age 12-18 months.

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)
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Due to its known low effectiveness, the Rubini-strain (mumps) vaccine should not be used in national immunization programmes. Persons previously immunized with the Rubini-strain vaccine should receive a dose of an effective mumps vaccine to ensure protection.

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)
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A second (mumps) opportunity is not required in countries where coverage with the first dose is sufficiently high (i.e. > 95%). If a second opportunity is required, it could be administered through a second routine dose, or by implementing periodical catch-up campaigns. Finally, if an initial catch-up campaign is implemented, the target age group should be determined according to mumps susceptibility. In most unvaccinated populations, most children acquire mumps infections before the age of 10 years.

Tetanus

Temperature sensitivity of vaccines

[WHO/IVB/06.10](#)
page 2

The recommended conditions for storing vaccines used in immunization programmes are shown in Appendix 81_1. This diagram also indicates the maximum times and temperatures in each case. At the higher levels of the cold chain, i.e., at national (primary), and regional or province level, OPV must be kept frozen between -15oC and -25oC. Freeze-dried vaccines (i.e., BCG, measles, MMR and yellow fever) may also be kept frozen at -15oC to -25oC if cold chain space permits, but this is neither essential nor recommended. At other levels of the cold chain (intermediate vaccine stores and health facilities), these vaccines should be stored between +2oC and +8oC. All other vaccines should be stored at between +2oC and +8oC at all levels of the cold chain. Liquid formulations of vaccines containing diphtheria, pertussis, tetanus, hepatitis B, Haemophilus influenzae type b, IPV and their combinations should not be frozen.

VPD Surveillance

WHO recommended standards for surveillance of selected vaccine-preventable diseases

[WHO/V&B/03.01](#)
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In countries achieving high routine mumps coverage and with low incidence that includes periodic outbreaks, surveillance should be used to identify high-risk populations and predict and prevent potential outbreaks. Countries having the objective of completely interrupting mumps transmission require intensive case-based surveillance to detect, investigate and confirm every suspect mumps case in the community.

WHO recommended standards for surveillance of selected vaccine-preventable diseases

[WHO/V&B/03.01](#)

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Recommended types of surveillance for mumps:

1) When mumps is endemic, only routine monthly reporting of aggregated data of clinical mumps cases is recommended by district, age group and immunization status. Only outbreaks (not each case) should be investigated.

2) When a high level of control is achieved (i.e. sustained high vaccine coverage), case-based surveillance should be conducted and every case should be reported and investigated immediately (and also included in the weekly or monthly reporting system). Suspected mumps outbreaks should be confirmed by conducting laboratory investigation on 5-10 cases only. In specific situations, viral isolation can be attempted to differentiate meningitis cases that could be related to the wild virus, the vaccine strain or other factors.

3) Designated reporting sites at all levels should report at a specified frequency (e.g. weekly or monthly) even if there are zero cases (often referred to as zero reporting).

WHO recommended standards for surveillance of selected vaccine-preventable diseases

[WHO/V&B/03.01](#)

page 21

Where (mumps) vaccine is used and high coverage is achieved the monitoring of vaccine-associated mumps meningitis and its differentiation from meningitis due to other causes can be an important issue. The monitoring of mumps meningitis, whether related to vaccine or natural disease, can be integrated into overall meningitis surveillance activities.

The vast majority of mumps vaccine is used in combination with measles and rubella vaccines (MMR), and surveillance strategies for mumps should take surveillance for measles, rubella and congenital rubella syndrome into consideration.

Global Advisory Committee on Vaccine Safety, 34 December 2003

[WER 2004, vol. 79, 3, pp 16-20](#)

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GACVS has recommended to WHO that an international reference laboratory for mumps virus isolates from vaccinees should be established.

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)

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In the context of a national mumps immunization programme, WHO recommends making mumps a notifiable disease.

Conclusions and recommendations from the Strategic Advisory Group of Experts (SAGE) - 10-11 April 2006

[WER 2006, vol. 81, 21, pp 210-220](#)

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Surveillance of mumps should be strengthened to include laboratory confirmation of mumps cases, virus genotyping and careful outbreak investigations.

Vaccine Administration

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)
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Assumed susceptible persons may be vaccinated (with mumps vaccine) without prior laboratory testing.

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)
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Primary mumps vaccination, especially in the recommended combination with rubella and measles vaccines, is easily adapted to the national vaccination programmes and does not interfere significantly with simultaneously-administered vaccines.

Vaccine Handling

Temperature sensitivity of vaccines

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The recommended conditions for storing vaccines used in immunization programmes are shown in Appendix 81_1. This diagram also indicates the maximum times and temperatures in each case. At the higher levels of the cold chain, i.e., at national (primary), and regional or province level, OPV must be kept frozen between -15oC and -25oC. Freeze-dried vaccines (i.e., BCG, measles, MMR and yellow fever) may also be kept frozen at -15oC to -25oC if cold chain space permits, but this is neither essential nor recommended. At other levels of the cold chain (intermediate vaccine stores and health facilities), these vaccines should be stored between +2oC and +8oC. All other vaccines should be stored at between +2oC and +8oC at all levels of the cold chain. Liquid formulations of vaccines containing diphtheria, pertussis, tetanus, hepatitis B, Haemophilus influenzae type b, IPV and their combinations should not be frozen.

Temperature sensitivity of vaccines

[WHO/IVB/06.10](#)
page 27

There is a serious risk when reconstituted (measles, mumps, and rubella vaccines and their combinations are) stored at any temperature for longer than six hours or above 8C for any period. This is not only because of the lack of potency, but also because of the possibility of contamination of the product, which could cause serious adverse consequences in those being vaccinated. When used, measles vaccine should be protected from elevated temperature and from light (light may inactivate the virus). Reconstituted vaccines must be discarded at the end of each immunization session and should NEVER be kept for use in subsequent sessions.

After reconstitution, measles and MMR vaccine rapidly lose their potency when kept at temperatures above 2-8C. Reconstituted measles and MMR vaccines should be kept cold during immunization procedures, must be discarded at the end of each immunization session and must never be kept for use in subsequent sessions.

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)
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The (mumps) vaccines are cold-chain dependent, and should be protected from light both before and after reconstitution. Reconstituted vaccine must be discarded if not used within 6 hours.

Vaccine Quality

Thermostability of vaccines

[WHO/GPV/98.07](#)
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The WHO thermostability requirements for mumps and rubella vaccines are similar to those for measles vaccine. At least three containers of monovalent or MMR vaccine are tested by incubation at 37C for seven days, at the end of which each monovalent vaccine or individual vaccine component is titrated in PFUs or CCID50 after selective neutralization, as necessary, of the other components. The geometric mean infectious virus titre must equal or exceed the required minimum number of infective units per human dose (3 log₁₀), and the geometric mean virus titre must not have decreased by more than 1 log₁₀ infective units during incubation.

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)
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WHO requirements do not specify the minimum amount of (mumps) vaccine virus that 1 human dose should contain. Rather, this is determined by the national regulatory authority of the country where the vaccine is produced.

Mumps virus vaccines (WHO position paper)

[WER 2001, vol. 76, 45, pp 346-356](#)
page 354

Due to its known low effectiveness, the Rubini-strain (mumps) vaccine should not be used in national immunization programmes. Persons previously immunized with the Rubini-strain vaccine should receive a dose of an effective mumps vaccine to ensure protection.

Conclusions and recommendations from the Strategic Advisory Group of Experts (SAGE) - 10-11 April 2006

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Additional information on the safety of different mumps vaccine strains is available from country experiences with use of mumps vaccine in mass campaigns and routine settings. These data should be reviewed by the GACVS and the resulting conclusions included in the revision of the WHO mumps position paper.

Yellow Fever

Temperature sensitivity of vaccines

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The recommended conditions for storing vaccines used in immunization programmes are shown in Appendix 81_1. This diagram also indicates the maximum times and temperatures in each case. At the higher levels of the cold chain, i.e., at national (primary), and regional or province level, OPV must be kept frozen between -15oC and -25oC. Freeze-dried vaccines (i.e., BCG, measles, MMR and yellow fever) may also be kept frozen at -15oC to -25oC if cold chain space permits, but this is neither essential nor recommended. At other levels of the cold chain (intermediate vaccine stores and health facilities), these vaccines should be stored between +2oC and +8oC. All other vaccines should be stored at between +2oC and +8oC at all levels of the cold chain. Liquid formulations of vaccines containing diphtheria, pertussis, tetanus, hepatitis B, Haemophilus influenzae type b, IPV and their combinations should not be frozen.