**Routine Childhood Immunization Schedule Recommendations from WHO Position Papers (2008) **

<table>
<thead>
<tr>
<th>Antigen</th>
<th>Recommended Age of 1st Dose (min/max age, if applicable)</th>
<th>Doses in Primary Series</th>
<th>Recommended Interval Between Doses (min interval, if applicable)</th>
<th>Booster Dose</th>
<th>Critical Issues (see footnotes for details)</th>
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</thead>
<tbody>
<tr>
<td>BCG 2</td>
<td>As soon as possible after birth</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>DTP 3</td>
<td>(min: 6 weeks)</td>
<td>3</td>
<td>1st to 2nd: (min:4 weeks) 2nd to 3rd: 4-8 weeks, with DTP2 3rd to 4th: 4-8 weeks, with DTP3</td>
<td>see footnote</td>
<td>Delayed/ interrupted schedules</td>
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<tr>
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<td>3</td>
<td>4-8 weeks, with DTP1</td>
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<tr>
<td>Hepatitis B 5</td>
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<td>3</td>
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<tr>
<td></td>
<td>Option 2 &lt;24 hours</td>
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<td>3rd to 4th: with DTP3</td>
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<td>9-15 months (min: see footnote)</td>
<td>1 or 2</td>
<td>1st to 2nd: (min:4 weeks) 2nd to 3rd: 4-8 weeks, with DTP3 3rd to 4th: 4-8 weeks, with DTP3</td>
<td>see footnote</td>
<td>Inactivated polio vaccine Vaccine options</td>
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<td>Pneumococcal (Conjugate) 7</td>
<td>6 weeks to 6 months</td>
<td>3</td>
<td>see footnote (see footnote)</td>
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<td>6 weeks (min: see footnote)</td>
<td>3</td>
<td>1st to 2nd: (min:4 weeks) 2nd to 3rd: 4-8 weeks, with DTP3 3rd to 4th: 4-8 weeks, with DTP3</td>
<td>see footnote</td>
<td>Inactivated polio vaccine Vaccine options</td>
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<td>Japanese Encephalitis 9</td>
<td>Live attenuated</td>
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<td>1st to 2nd: (min:4 weeks) 2nd to 3rd: 4-8 weeks, with DTP3 3rd to 4th: 4-8 weeks, with DTP3</td>
<td>see footnote</td>
<td>Inactivated polio vaccine Vaccine options</td>
</tr>
<tr>
<td>Yellow Fever 10</td>
<td>9-12 months</td>
<td>1</td>
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<tr>
<td>Rotavirus 11</td>
<td>Rotarix (min: 6 weeks, max: 12 weeks)</td>
<td>2</td>
<td>1st to 2nd: (min:4 weeks), before 24 weeks of age</td>
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<tr>
<td></td>
<td>RotaTeq (min: 6 weeks, max: 12 weeks)</td>
<td>3</td>
<td>2nd to 3rd: 4-10 weeks, before 32 weeks of age</td>
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<tr>
<td>Typhoid 12</td>
<td>Vi (min: 2 years)</td>
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<td>Definition of high risk</td>
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<td>Ty21a See footnote</td>
<td>3 or 4</td>
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<td></td>
<td>Definition of high risk</td>
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<tr>
<td>Cholera 13</td>
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<td>1st to 2nd: (min:7days)</td>
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<td>Definition of high risk</td>
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<td></td>
<td>CVD103-HgR (min:2 years)</td>
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<td></td>
<td>Definition of high risk</td>
</tr>
<tr>
<td>Meningococcus (polysaccharide) 14</td>
<td>(min:2 years)</td>
<td>1</td>
<td></td>
<td></td>
<td>Definition of high risk</td>
</tr>
<tr>
<td>Hepatitis A 15</td>
<td>(min:1 year)</td>
<td>2</td>
<td>6-18 months 3rd to 4th: 6 days</td>
<td></td>
<td>Definition of high risk</td>
</tr>
<tr>
<td>Rabies 16</td>
<td>not defined</td>
<td>3</td>
<td></td>
<td></td>
<td>Definition of high risk</td>
</tr>
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<td>Mumps 17</td>
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<tr>
<td>Rubella 18</td>
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<td>1</td>
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<td>Coverage Criteria</td>
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<td>Influenza (Inactivated) 19</td>
<td>(min:6 months)</td>
<td>2</td>
<td>1st to 2nd: 1 month</td>
<td></td>
<td>Program Criteria</td>
</tr>
</tbody>
</table>

Abbreviations: 'max': maximum 'min': minimum

Key:
- Universally recommended for all children of appropriate age
- Universally recommended for all children residing in certain regions
- Recommended for children in some high-risk populations
- Recommended for children in certain immunization programs

This schedule represents the use of vaccines recommended in WHO position papers for administration to children. The ages and intervals displayed reflects recommendations for immunization managers and policy makers, and not for health care workers. Country specific schedules are developed separately, based on epidemiological, programmatic, resource and policy considerations. While vaccines are universally recommended, some children may have contraindications to vaccination.
The table presents the recommendations based on WHO position papers for vaccine administration. It is designed to assist planners develop an appropriate immunization schedule. Health care workers should refer to a national table.

- **Doses administered by campaign may or may not contribute to a child’s routine immunization schedule depending on type and purpose of campaign and depending on whether the vaccination is recorded on the individual's record.**
- **Recommendations for the age of initiation of primary immunization series and/or booster doses for some antigens are not available. Instead, the criteria for age at first dose is determined from epidemiologic data.**
- **If a catch-up schedule for interrupted immunization is available, it is noted in the footnotes**
- **Other vaccines may be of individual benefit but are not recommended for routine immunization.**
- **Refer to [http://www.who.int/immunization/documents/positionpapers/](http://www.who.int/immunization/documents/positionpapers/) for schedule and position paper updates.**

### BCG
- **Recommended for children living in countries with a high-disease burden and for high-risk children living in countries with low-disease burden.**

### DTP (Diphtheria, Tetanus and Pertussis)
- **Tetanus position paper reference:** *Weekly Epid. Record* (2006, 81: 198-208)
- **Recommended for three doses during the first year of life. In areas where pertussis is of particular risk to young infants, DTP should be started at 6 weeks with 2 subsequent doses at least 4 weeks apart.**
- **Pertussis Vaccine:** Use of acellular or whole cell pertussis component in the combination vaccine is considered to be equivalent for administration to children, but whole cell vaccine is not recommended for adolescents or adults.
- **Pertussis booster dose- administered 1-6 years after the primary series, but before the child is 7 years of age, is warranted in countries where the pertussis incidence has been considerably reduced. Need for additional pertussis booster doses should be assessed by the individual national immunization programmes.**
- **Diphtheria booster dose- to compensate for the loss of natural diphtheria boosting in some areas, childhood boosters should be given. The optimal timing of and number of booster doses should be based on epidemiological surveillance as well as on immunological and programmatic considerations.**
- **Delayed or interrupted series- For children 1 to less than 7 years of age with no previous immunization: Three doses should be given, with an interval of 2 months between the first and second dose and an interval of 6-12 months between the second and third. Children whose vaccination series has been interrupted should have their series resumed, without repeating previous doses. See tetanus position paper for further details regarding delayed and interrupted schedules.**

### Haemophilus influenzae type b
- **Position paper reference:** *Weekly Epid. Record* (2006, 81: 210-20)
- **Immunization should start as early as possible after the age of 6 weeks.**
- **The vaccine is not generally offered to children aged >24 months owing to the limited burden of Hib disease among children older than that age.**
- **Delayed series- if a child is not vaccinated, one dose can be given to children between 12 and 24 months.**
- **Booster dose may be administered to children aged between 12 months and 18 months.**

### Hepatitis B
- **Three recommended schedule options are available for Hepatitis B vaccination (options 1-3 in table). The most appropriate schedule is determined based on epidemiologic and programmatic considerations. Please see position paper for details.**

### Measles
- **The first dose should be given at 9 months, unless the country has low measles circulation in which case the first dose should be given between 12-15 months. While the minimum age for first dose is 9 months in healthy children, HIV-positive children should receive their first dose at 6 months followed by an additional dose at 9 months. See position paper for details.**
- **A second opportunity for vaccination should be available through routine vaccination (often at 4-6 years of age) and/or supplemental immunization activities.**

### Pneumococcal (Conjugate)
- **Booster dose- two schedules have been proved efficacious: (1) 6, 10, and 14 weeks of age without a booster and (2) 2, 4, and 6 months of age with a 12-15 month booster.**
- **Polysaccharide pneumococcal vaccine has no current position paper. The previous position paper ([Weekly Epid. Record [2003, 78: 110-119]]) is currently being revised.**

### Polio
- **Recommendations are for oral polio vaccine. There are no recommendations for the use of inactivated polio vaccine prior to the certification of the eradication of polio. Post-eradication recommendations are available [Weekly Epid. Record (2003, 78:241-250)]. Countries who wish to use IPV may consult WHO for further guidance.**
- **A dose at birth dose of oral polio vaccine is recommended in endemic or recently endemic countries.**

### Japanese encephalitis (JE)
- **JE vaccine should be given in all areas where JE constitutes a public health problem.**
- **Three types of vaccines are available: (1) a live attenuated, (2) an inactivated and (3) a mouse brain-derived. The WHO schedule recommendations are available for the mouse brain-derived and live attenuated vaccines.**
- **Booster doses for mouse-derived vaccine are administered until 15 years of age.**
10 Yellow Fever
- Recommended for use in countries at risk of Yellow Fever

11 Rotavirus
- Strongly recommended for use in regions where vaccine efficacy data suggests a significant public health impact and able to sustain vaccine utilization (currently in the United States, Europe, and Latin America)
- Rotavirus vaccines present the characteristic of not being indicated beyond 12 weeks of age for the first dose and beyond 24 (Rotarix™, 2 dose series) or 32 (RotaTeq™, 3 dose series) weeks of age for the last dose of the series

12 Typhoid
- Recommended for school-age and/or preschool-age children in areas where typhoid fever in these age groups is shown to be a significant public health problem, particularly where antibiotic-resistant S. Typhi is prevalent
- Typhoid Vi vaccine, requires one parenterally administered dose which maybe given after the age of 2 years; the Ty21a vaccine requires 3 or 4 orally administered doses either as a capsule (for use in individuals from the age of 5 years) or as a liquid (for use in individuals from the age of 2 years). See position paper for further details

13 Cholera
- Age of initial administration is when epidemiologically appropriate after the age of 2 years old
- Choice of vaccine: oral killed whole cell vaccine (WC/rBS) is recommended for populations at imminent risk of cholera (e.g. urban slum residents and refugees. An oral live vaccine (single dose of CVD 103-HgR) is recommended for travellers to high-risk regions

14 Meningococcus
- Recommended for high-risk groups (e.g. those in armed forces units, training camps, or boarding schools, and travellers to epidemic areas), and for persons with immunological predisposition to meningococcal disease (such as asplenia and inherited immunological deficiencies)
- Polysaccharide and conjugate vaccines are available for group C disease. Inclusion of a conjugated group C vaccine should be considered in areas where group C meningococcal disease is a substantial public health problem among young children using a 2, 3, and 4 months of age schedule. Where disease in children above 2 years of age is the main concern or where resources are limited, several years of protection may be achieved with a single injection of the combined groups A and C polysaccharide vaccine. Choice of vaccine (conjugate or polysaccharide) depends on local epidemiology and availability of sufficient resources to acquire and administer vaccine. See position paper for details

15 Hepatitis A
- Minimum age of administration is specified by the manufacturer and found on the product label
- Suggested for persons at high-risk in countries with low endemicity of hepatitis A as well as those populations living in countries of intermediate endemicity. High-risk groups include certain ethnic or religious groups. See position paper for details

16 Rabies
- Recommended for anyone at increased risk of exposure, including children living in rabies enzootic-regions
- Age for initiation of the series is based on epidemiologic and programmatic considerations. The series is given at 0, 7, and 21 days
- Timing of booster dose is based upon neutralizing antibody titre. If testing is not available, booster doses may be given every 5 years

17 Mumps
- Recommended for use in high performing immunization programs with the capacity to maintain coverage over 80% and where mumps reduction is a public health priority.
- If implemented, a combination vaccine of measles, mumps and rubella is recommended

18 Rubella
- Recommended for countries wishing to prevent the occurrence of congenital rubella infection including congenital rubella syndrome (CRS), 2 approaches are recommended: (a) prevention of CRS only, through immunization of adolescent girls and/or women of childbearing age; or, if high coverage can be achieved and maintained, (b) elimination of rubella as well as CRS through universal vaccination of infants, surveillance and assuring immunity in women of childbearing age. See position paper for details
- The rubella schedule is based on the measles schedule as administration of rubella and measles vaccine should occur using a combined vaccine

19 Seasonal Influenza (Inactivated Vaccine)
- The World Health Assembly recommended increased immunization coverage of high-risk groups including elderly, in those countries where influenza vaccination policies exist (Reference: WHA56,19, 2003). See position paper for detailed description of high-risk groups.