NATIONAL IMMUNIZATION PROGRAMME IS A SOCIETAL MISSION AND IS COMMITTED TO THE GOAL OF IMMUNIZING:

a) At least 85% of all infants born, with one dose of BCG, three doses of DPT and OPV and one dose of measles vaccinations. This prevents infants and young children from contracting six common vaccine-preventable diseases, namely, measles, neonatal tetanus, acute paralytic poliomyelitis, pertussis, childhood tuberculosis and diphtheria.

b) One hundred percent of all pregnant women with tetanus toxoid.

c) Making additional efforts of immunization like pulse polio immunization for polio eradication, urban measles immunization campaigns to move towards measles elimination, tetanus toxoid campaigns for child bearing age women to eliminate neonatal tetanus in endemic states.
The World Summit for Children has set a goal of 90% reduction of measles cases and a 95% reduction in measles deaths compared with the pre-vaccine era, by the year 2000 AD. At mid-decade a reduction of 74% in measles cases and 86% in measles deaths has been reported, globally. Although, some countries have managed to nearly interrupt transmission of measles, many have managed to achieve low endemic levels. Despite this dramatic reduction, there are still about 1 million children under five dying of measles every year. The 20 developing countries contribute for 85% of this misery and India alone contributes 27% of global measles deaths.

While many of the 50 million children infected annually recover in about a week, suffering only an unpleasant rash, fever and temporary weight loss, others develop complications that can be fatal. For some, life is drained away by the dehydration caused by diarrhoea; others die from convulsions or bronchial pneumonia; a few pulse rates soar so high that their heart fails.

Many of those who survive measles are left with lifelong disabilities, including brain damage, blindness and deafness. And because the disease depresses the appetite, burns energy in fevers, inhibits the absorption of food and drains away essential nutrients such as vitamin A through diarrhoea and vomiting, millions more children are left vulnerable to a continuing cycle of illness and poor growth.
One of the main strategies for measles control, which focused on “Urban measles control” was put forward by UNICEF and was endorsed globally as potentially having the greatest impact on preventing measles deaths and cases. The Ministry of Health and Family Welfare, Government of India has decided to implement urban measles control strategy.

**Indian Scenario**

Measles vaccine was introduced in the National Immunization Programme in 1985-86. The vaccine was made available to all the districts by 1989-90. Reported coverage levels have increased from 1.3% in 1985-86 to around 80% in 1990-91 and have been sustained. The reported measles cases for the year 1987 were 2,47,519 which has declined to 45,190 in 1997 (81.7%).

The estimate of measles deaths is based on the reported coverage levels. And, often there is a considerable gap between the reported and the evaluated coverage, therefore, the annual number of deaths attributable to measles may be more than the estimate. The nationwide coverage evaluation in March-May 1998 indicates that measles coverage is 66%.

The evaluated coverage and/or the gap between reported and evaluated coverage clearly demarcates the States of Bihar, Assam, Arunachal Pradesh, Meghalaya, Manipur, Nagaland, Orissa, UP and West Bengal as the ones still unable to reach a large proportion of children with measles vaccine.
Similar surveys done in 74 cities during the same period point to the cities having less than 50% coverage for measles, e.g., Agra, Kanpur, Lucknow, Varanasi in UP; Bhavnagar, Jamnagar and Surat in Gujarat; Delhi; Guwahati in Assam, Patna, and Ranchi in Bihar. Twenty-nine cities had the coverage between 50-75%. Naturally children in these cities are at high risk of suffering from measles disease, its complications and consequences.

The outbreaks of measles in Madhya Pradesh (1985) in Uttar Pradesh (1996) demonstrate the consequences low measles vaccine coverage levels in rural areas. The CTR in the hospitalized cases was 4% with a range of 1.8% to 7.6%. Measles is one of the diseases to be reported monthly among the vaccine preventable diseases. However, the information is highly underreported. Also, deaths attributable to measles are generally not included as the system of recording deaths from all complications following measles (i.e., pneumonia, diarrhoea, etc.) does not exist.

The only study done in 1994 suggests supplementation level was achieved in Maharashtra. Scientific evidence demonstrates that vitamin A supplementation reduces the duration, severity and complications associated with measles. Providing vitamin A to an infant twice-a-year can reduce death risk by 25-33% each year in the developing world. Many evaluations show the supplementation to be 30-50% in all states. Regular supply of vitamin A concentrate appears to be a major problem.
Measles is a ubiquitous, highly infectious disease affecting nearly every person in a given population by adolescence in the absence of immunization programmes. Measles is primarily transmitted from person-to-person by large droplets, but can also be spread by the airborne route as aerosolized droplet nuclei. Measles is most infectious during the prodrome. First there is localized infection of the respiratory epithelium of the nasopharynx and possibly the conjunctivae, with spread to regional lymphatics. Primary viremia begins 2 to 3 days following the exposure, and an intense secondary viremia sets in 3 to 4 days later. The secondary viremia leads to infection of and further replication in the skin, conjunctivae, respiratory tract and other distant organs.

These events correspond with an incubation period between exposure and the onset of symptoms of 10 to 12 days. The prodromal period begins, with fever, malaise, conjunctivitis, coryza, and laryngotonsillitis. Koplik spots appear on the buccal mucosa 1 to 2 days before rash onset and may be noted for an additional 1 to 2 days after the onset of rash. The rash is an erythematous maculopapular eruption that usually appears 14 days after exposure and spreads from head to extremities over 3 to 4 days. Over the next 3 to 4 days, the rash fades; in severe cases desquamation may occur. Other constitutional signs and symptoms, such as anorexia, diarrhea and generalized lymphadenopathy may also be present.
DIAGNOSTIC FEATURES FOR MEASLES DISEASE

* COUGH, COLD AND RUNNING NOSE
* FEVER 38 °C (100.4 °F) OR MORE
* PINK/RED AND WATERY EYES, SENSITIVE TO LIGHT
* CHARACTERISTIC SLOUCHY RASH WITHIN 3-7 DAYS, APPEARING FIRST ON FACE THEN ON ENTIRE BODY
* RASH LSTS FOR 4-7 DAYS, ENDS WITH SKIN PEELING
* KOPLIK'S SPOTS (WHITE WITH RED BORDER) APPEAR ON THE INSIDE OF CHEEK WITH THE ONSET OF RASH

LAB-TEST FOR MEASLES DISEASE

* NIV, Pune has made available an IgM ELISA test for laboratory confirmation of measles disease.

The most commonly cited complications associated with measles infection are diarrhea (15.9%), pneumonia (1-6%), post-infection encephalitis (1:1000 to 1:2000 cases), and DENGUE (1,000 to 11,000 cases). The risk of serious complications and death is increased in young children and adults. SSPE is a rare degenerative central nervous disease caused by a persistent infection with a defective measles-like virus, which develops approximately 7 years after measles infection. Patients develop progressive personality changes, myoclonic seizures, and motor disability, leading to coma and death. SSPE is more common in males than females. Other common complications observed are diarrhea and VIT A deficiency.
Measles is more rapidly transmitted in large families, crowded homes and urban slums. With high population density, it is apt to occur year-round, at times with seasonal peak. Without immunization, almost every child acquires measles. Although, measles can occur at any age, in India an unimmunized child may experience it before the third birthday. The reason could be overcrowding and increased contact especially among young children. Secondary cases in homes are more severe. Measles is severe among infants and malnourished children. Post-measles complications are also more common in malnourished children.

Community studies have shown CFRs in endemic situations to be around 1-2% and during outbreaks varying from 3-15%. CFRs vary with age at infection, intensity of exposure, nutritional status, and availability of treatment. In Surat (Gujarat) a recent study conducted as a part of measles elimination efforts by Department of PSM, Government Medical College, showed an incidence of 7.67% in 1997-98. This observation suggests that measles is definitely a public health problem.
In primary acute infection, both IgG and IgM antibodies are initially produced. IgM antibodies peak at 7-10 days after rash onset and fall rapidly, rarely being detectable more than 4 weeks after the rash onset. IgG antibodies become detectable in the serum soon after rash onset, peak within 4 weeks and subsequently decline, but persist for life (Figure 1). Measles infection is diagnosed serologically by either detecting IgM or demonstrating
a significant rise in IgG between paired acute and convalescent sera.

**The Response to Immunization**

The levels of antibody induced by immunization with attenuated measles virus vary with an approximately log-normal distribution (Figure 2), and reach lower peak levels than those induced by wild virus. Antibody persists longer when there is boosting from exposure to circulating wild virus.

![Figure 2. Measles antibody response and persistence after natural infection or immunization (Klugman 1972)](image-url)
**THE DETERMINANTS OF RESPONSE TO IMMUNIZATION**

**Host factors**

**Age**

The response to immunization increases up to the age at which all children have lost maternal antibody (Table 1). The major reason for the age-dependent response appears to be the maternal antibody level pre-immunization (Figure 3).

<table>
<thead>
<tr>
<th>Country</th>
<th>05</th>
<th>06</th>
<th>07</th>
<th>08</th>
<th>09</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haiti*</td>
<td>65</td>
<td>65</td>
<td>67</td>
<td>68</td>
<td>69</td>
<td>70</td>
<td>71</td>
<td>72</td>
</tr>
<tr>
<td>Kenya**</td>
<td>60</td>
<td>90</td>
<td>67</td>
<td>100</td>
<td>93</td>
<td>94</td>
<td>95</td>
<td>100</td>
</tr>
</tbody>
</table>

*Higstedt 1985; **Malhotra et al. 1979

Table 1: Seroconversion (% by age in months)

**Maternal antibody level**

Reasons for earlier loss of maternal antibody in developing countries include lower antibody levels among mothers (particularly in southeast Asia), decreased efficiency of transplacental transfer of measles IgG, increased catabolism of passive antibody due to frequent infections in infancy, and loss of antibody into the intestinal lumen during diarrheal illness. A recent study of NIV, done indicates that 22% of pregnant women tested did not have IgG antibodies, so also their newborns.
Impact of Measles Vaccination at Various Ages Between 4 and 10 Months, Kenya, 1974-1981

Figure 3

- % that immunization does not protect due to maternal antibodies
- % who have had measles before immunization
- % protected by immunization

*Source: WER 1982: 17, 89-91
Nutritional status

Several studies have reported seroconversion rates at least as high as in well-nourished children. The Universal Immunization Programme (UIP), therefore, recommends that high priority should be given to the immunization of malnourished children as there is always a high risk of severe disease and worsening of nutritional status during or after measles disease.

Intercurrent illness

Measles immunization of children with acute illness in developing countries has been found to be safe and effective. The UIP, therefore, recommends that measles immunization should not be withheld from children with an acute illness. The children requiring hospitalization should, however, be considered on a case-by-case basis. And, eligible children should get it on admission wherever possible or at a minimum, prior to discharge.

Immunosuppression

Due to the risk of serious adverse events, measles immunization is generally contraindicated in immunosuppressed persons. An exception is children infected with human immunodeficiency virus. Routine immunization of all infants without screening for HIV status is the current recommendation.
Agent factors

Several studies have found that Edmonston-Zagreb (EZ) vaccine gave superior seroconversion rates to Schwarz strain. Therefore, in India, UIP has accepted EZ strain for use.

Programme factors

Poor maintenance of cold chain has been implicated as a cause of low vaccine efficacy. New stabilizers have made the freeze-dried vaccine less heat-labile, reconstituted vaccine is still sensitive to heat and sunlight. Use of disinfectants to 'sterilize' the syringes/needles may also reduce the efficacy of vaccine.

Route of administration

UIP at present, recommends only the subcutaneous route.

Dose

The recommended dose of measles vaccine in UIP is 0.5 ml subcutaneously.

Age for immunization

National Immunization schedule recommends measles vaccine after 270 days and before 365 days.
How to give measles vaccination

Measles vaccine available in India is EZ strain manufactured in Pune. It is freeze dried, therefore, needs to be reconstituted by using the pyrogen-free double distilled water (supplied as diluent with the vaccine) before the administration. Always cool the diluent before use. And ensure the use of reconstituted vaccine within 4 hours.

Wait until at least one child of eligible age has arrived.

Take a sterile 5ml syringe and a 20G sterile needle. Open a cool ampoule of diluent and draw 5 ml of distilled water for 10-dose vial (Check the label for expiry date before opening).

Empty the diluent into the vaccine vial. Gently roll the vial between the palms of your hands for mixing. (Do not vigorously shake or leave the needle in the vial.)

Position the child. Load a 2ml tuberculin syringe with 0.5 ml of reconstituted vaccine using 23G sterilized needle.

Pinch the skin on the outer part of the child's upperarm (left or right) with your fingers. Push the needle into the pinched skin—not straight in, but sloping and not too far. To control the needle, support the adaptor end of the syringe with your thumb & finger while pushing in.

Withdraw the plunger to check for blood. After ensuring that the needle is not in any vein, press the plunger with your thumb & inject the vaccine.

Withdraw the needle and keep syringe as well as needle in a separate tray for sterilization.
SAFETY OF MEASLES VACCINE

Measles vaccine is very safe, if reconstituted vaccine is used within 4 hours with one sterilized syringe and sterilized needle for one injection. However, about 30% of those vaccinated develop malaise, mild fever and/or a rash 4-10 days after the vaccination. The parents need to be informed about this possibility. Severe complications like convulsions have occurred in 0.02 to 10 per 1 lakh vaccinated individuals, compared with 500 to 1000 per 1 lakh measles cases. Similarly encephalitis has been observed in 1 per 1 lakh vaccinated individuals, against 200 to 4000 per 1 lakh measles cases.

PROTECTION AFTER IMMUNIZATION

Proportion of vaccinees who are protected

Protection from disease has been defined either in serological or in epidemiological terms. In the former, seroconversion after immunization has been equated with protection from disease. In the latter, vaccine efficacy is estimated as the percentage reduction in disease incidence attributable to immunization, calculated by means of the following equation:

\[
\text{Vaccine efficacy (\%) = } \frac{\text{AR}_{\text{U}} - \text{AR}_{\text{I}}}{\text{AR}_{\text{U}}} \times 100 = (1 - R) \times 100
\]

\(\text{AR}_U\) = attack rate in unimmunized population

\(\text{AR}_I\) = attack rate in immunized population
Serological studies performed in developing countries have shown seroconversion rates after immunization at age 9 months of 80-90%.

**Duration of immunity**

Several prospective studies of antibodies persistence after measles immunization have identified antibodies in over 85% of vaccinates 8 to 16 years post-immunization. Immunity after measles immunization appears to be varying from full, partial minimal to no protection. But, when measles cases do occur in immunized persons, many reports suggest that the disease is milder than in unimmunized persons.

**CURRENT RECOMMENDATIONS UNDER UIP**

To obtain the optimal immune response to immunization, measles vaccine should be administered at an age when children have lost maternal antibodies. However, the immunological response must be balanced against the risk of measles at a given age, and this is reflected in measles immunization policies. CURRENT RECOMMENDATIONS ARE, THEREFORE, TO CONTINUE TO ADMINISTER MEASLES VACCINE AT AGE 9 MONTHS (270+ DAYS), EXCEPT IN SPECIAL SITUATIONS WHERE YOUNGER INFANTS ARE AT HIGH RISK OF EXPOSURE TO MEASLES.
Simultaneous administration and combination of measles with other vaccine

Measles vaccine has been shown to be effective when given simultaneously with DPT and/or polio vaccine, with yellow fever vaccine, and with hepatitis B vaccine. Also, it can be given with BCG vaccine safely on the same day. If not given on the same day a gap of 4 weeks should be observed because of the cell-mediated immune response to BCG reduces the humoral response to measles vaccine. The UIP, therefore, recommends simultaneous administration of measles vaccine with BCG.

UIP recommends simultaneous administration of measles vaccine with some other vaccines such as DPT vaccine or yellow fever vaccine, in the same syringe for several reasons. Some preservatives reduce measles vaccine viability and indiscriminate mixing of vaccines could reduce vaccine potency.

**Two-dose schedule**

A two-dose schedule is used in two situations, 1) the first dose must be given at an age at which seroconversion is known to be suboptimal because the risk of early measles morbidity and mortality is high (eg, refugee camps, outbreaks); 2) in countries
with measles elimination goals, to help achieve the very high levels (98%) of herd immunity required. In most developing countries, it is premature to adopt a two-dose schedule. Therefore, in India only first dose is given.

MEASLES VACCINATION DURING EPIDEMICS

Measles vaccine can protect children who have been exposed to measles, and prevent the disease from occurring. But this is possible only when the children receive the vaccine within the first 72 hours after exposure. The vaccine given beyond 3 days after exposure will do absolutely no harm, but may not protect the children. Thus, mass measles vaccinations during epidemics are useful if vaccination can be completed within 3 days of the first case.

REASONS FOR LOW MEASLES COVERAGE

Even though capable health workers and viable vaccines are available, adequate immunization is often not done. Many field studies and observations have unearthed the socio-cultural, operational or technical reasons for the prevailing low coverage levels. The reasons may be summarized as following:

Socio-cultural

* Measles is not considered to be a serious disease by some parents, health personnel and even few doctors.
Operational

* Few adverse reactions and unfortunate deaths after improper measles vaccination have been highlighted by the media that has led to the restrictive directives, such as measles vaccine be administered in the presence of a doctor only.
* Medical institutions and health workers accustomed to shortages and accountability are reluctant to open a 10-dose vial for 1 or 2 eligible infants for the fear of wasting other doses.
* Malnourished child of 9 months age may appear younger, so, health workers and even doctors may decide not to vaccinate.
* The age window (9-12 months) in the UIP gives only 3 months time for the service provider/parent to get a child immunized.
* The interval between DPT3/OPV3 and measles vaccination is 6 months that may lead parents and even health workers to forget about the vaccine. This results in poor compliance.

Technical

* In about 10-30% of immunized children, fever and mild measles-like rashes appear after the measles vaccination. Health workers are often afraid to explain this for the fear of putting the parents against immunizing their children.
* A service provider may withhold the vaccine due to a minor illness, e.g., mild fever, diarrhea, etc., (30% children fail to get vaccinated due to sickness.
* The mother may give a history of measles occurrence (30% wrong) and thus no vaccine may be thought necessary.
* Some pediatricians prefer to give measles vaccination after 12 months of age.
## Goal

The overall goal of the initiative is to interrupt measles transmission in major cities, especially in urban slums.

### Why focus in urban areas?

- A large proportion of measles cases and deaths occur in urban areas. Over-crowding puts children at risk of contracting the disease.
- Measles immunization rates have not been high enough to control measles. Fewer than 80% of children under-one are immunized against measles in urban slums. To reduce transmission rates >90% of the children need to be vaccinated.
- Cities act as 'seedbeds' for the virus. Children often visiting from rural areas become infected in crowded market, trains, buses, etc. and take the virus back to the villages.

### Specific objective

Routine measles immunization should be improved by involving NGOs and private sector to provide additional immunization sessions in the under-reached or un-reached areas. Measles immunization campaigns will be conducted in under-
served, densely populated urban and peri-urban areas for children in high-risk age groups in 1-2 cities per major state. Vitamin A supplements and household skills in caring for children with measles should be promoted more. Surveillance system and standard case management practices both in public and private sections to assess the impact of the initiative in terms of incidence and CFRs should be built. The National Consultation held in October 1998 has recommended following strategies:

**Strategies for Accelerated Measles Control**

1. **Improve routine measles immunization services and increase routine coverage levels:**
   - Measles immunization services in urban areas are generally restricted to hospitals, dispensaries and private clinics. Through a systematic purposive survey, one needs to identify the slum/urban poor/middle class/congested pockets and organize immunization services at least once a month and additional immunization services where already routine immunization services exist. This strategy should not be limited to urban areas only, in other words, it should include both rural and urban areas.

**Measures to improve measles vaccination coverage:**

- Orient the medical colleagues with requisite technical details to stress upon the magnitude of the measles problem and the need for its immunization.
- Let doctors know that in the present situation, the country can derive best
results by administering measles immunization immediately after 9 months (270 days) of age.

Promote community awareness through mass media, interpersonal communication, and action to identify each child and make sure they are immunized.

Promote routine immunization for all children in the age group of 9-12 months, even if they are malnourished.

Ensure that immunization is done promptly (within 24 hours of every child's birthday) with routine immunization (routine immunization even if the immunization is done is a high-quality level).

Provide measles immunization services for all children in the age group of 9-12 months, even if they are malnourished.

Ensure that immunization card (IMCI-based) is issued to parents of every child and that it is kept with the child or health worker.

Ensure review of the card for immunization status actively or passively and ensure that it is updated. This will help in achieving high coverage.

Ensure that measles immunization services are provided in all immunization sessions.

Promote routine Vitamin A supplementation:

Majority of the surveys indicate routine Vitamin A supplementation coverage to be around 40-60% in urban slums. Though, the main reason is availability of Vitamin A, lack of outreach services can also contribute to the low coverage. Lack of understanding in the private sector on the need and utility of Vitamin A supplementation may also be one of the reasons. Actions on all these fronts need to be taken.

Improve routine Vitamin A supplementation:
3. Organizing special immunization campaign:

   a) Identifying cities having high risk for measles, by:
      i) Existing data on incidence either in the Government/private sector
      ii) House hold surveys for measles incidence and immunization coverage.
   b) A quick participatory assessment of incidence and immunization coverage in the community.

   After assessing the situation of measles immunization and identifying the cities for the initiative, have intersectoral planning meeting. Identify partners and allocate responsibilities with mutual consultation. Campaign will be organized in the entire city for children in the age 9 months-5 years (local adjustment to be made depending on the epidemiology and age distribution of measles cases in the locality) with special attention to the urban poor and unanswered children. As a follow up uncovered areas will be identified and responsibilities to these pockets will be allocated to different Government/municipal/NGO agencies for additional immunization quarterly. The main features of these campaigns will be:

   a. Target all children at 9 months age (adjusted for local epidemiological needs) regardless of prior vaccination status.
   b. Involve all children in the identified age group without asking for the previous immunization data of children who have been immunized in last one month to be avoided as this will not be effective.
   c. Mobilize NGOs, professional bodies and neighborhood committees for
SIRV for demand generation and active participation, especially to reach the children unachieved by the routine immunization services.

Immunisation is given in the campaign using a double-headed syringe only and arrange for the safe disposal of these syringes.
4. Disease Surveillance:
   - Strengthen surveillance of measles and other vaccine-preventable diseases at the municipal level, both in outpatient and inpatient settings.
   - Increase private practitioners' and informal providers' reporting.
   - Conduct community-based surveys for active case finding campaigns.

5. Develop standard case management practices for the clinicians managing measles complications.

6. Consider serological diagnostic tests:
   - IgM ELISA: A specific and sensitive test for the detection of measles virus IgM antibodies. It involves coating the wells of an ELISA microplate with purified measles virus antigens. Adding the patient's serum to the wells, followed by addition of anti-human IgM conjugate antibody and color development with TMB substrate. This test distinguishes between 2 categories:
     a) Confirmed infection—clinical features with IgM antibody detection:
     b) Subclinical infection—detection of IgM antibodies without clinical features or with mild respiratory symptoms. Siblings of measles case can get subclinical infection.
   - Serologic surveillance is crucial for evaluating vaccination strategies. Serologic surveys should be conducted before and after measles immunization campaigns.
   - If the programmed vaccination is effective, antibodies to the measles virus will be detected in the sera of vaccinated individuals, providing indirect evidence of protective antibodies.
### Protocol for Household Measles Incidence Survey

<table>
<thead>
<tr>
<th>Age Group in Months</th>
<th>Male Children</th>
<th>Female Children</th>
<th>Total Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-23</td>
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<td></td>
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<tr>
<td>24-35</td>
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<tr>
<td>36-47</td>
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<td></td>
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<tr>
<td>48-59</td>
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</tr>
<tr>
<td>≥60</td>
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</tr>
</tbody>
</table>

**Note:** tally mark number of children according to sex and age groups.

Please fill up spaces of each and complete in format (1) for each measles case.
<table>
<thead>
<tr>
<th>Case Details</th>
<th>Child Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Max. Malaria Fever</td>
<td></td>
</tr>
<tr>
<td>2. Pneumonia</td>
<td></td>
</tr>
<tr>
<td>3. Allergic</td>
<td></td>
</tr>
<tr>
<td>4. Rash (adults after 4 days or more)</td>
<td></td>
</tr>
<tr>
<td>5. Age (months, years)</td>
<td></td>
</tr>
<tr>
<td>6. During illness was there:</td>
<td></td>
</tr>
<tr>
<td>7. - a rash for 3 days or more</td>
<td></td>
</tr>
<tr>
<td>8. - fever of 38°C or above</td>
<td></td>
</tr>
<tr>
<td>9. - dry cough, cold, URI</td>
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<tr>
<td>10. - conjunctivitis/red eyes</td>
<td></td>
</tr>
<tr>
<td>11. - Did the rash start from face and progress down to abdomen and legs?</td>
<td></td>
</tr>
<tr>
<td>12. - Was there a discolouration of the skin after the rash?</td>
<td></td>
</tr>
<tr>
<td>13. - Was the child put under vaccine before illness?</td>
<td></td>
</tr>
<tr>
<td>14. - Was it given?</td>
<td></td>
</tr>
<tr>
<td>15. - After drinking</td>
<td></td>
</tr>
<tr>
<td>16. - Was there another case in the same household within a month before this?</td>
<td></td>
</tr>
<tr>
<td>17. - Was there meningitis before illness?</td>
<td></td>
</tr>
<tr>
<td>18. - Was there cerebral palsy before illness?</td>
<td></td>
</tr>
<tr>
<td>19. - Did the child live in the defined area for at least 10 days before the illness?</td>
<td></td>
</tr>
<tr>
<td>20. - Was there a rash in the defined area 1 month after the illness?</td>
<td></td>
</tr>
<tr>
<td>Child Number</td>
<td>1</td>
</tr>
<tr>
<td>-------------</td>
<td>---</td>
</tr>
<tr>
<td>Case Details</td>
<td></td>
</tr>
<tr>
<td>1. Date attended</td>
<td></td>
</tr>
<tr>
<td>2. Presenting complaints:</td>
<td></td>
</tr>
<tr>
<td>D-Diarrhoea</td>
<td></td>
</tr>
<tr>
<td>A-ARI</td>
<td></td>
</tr>
<tr>
<td>ED- Ear discharge</td>
<td></td>
</tr>
<tr>
<td>EP-Eye problem</td>
<td></td>
</tr>
<tr>
<td>M-Measles without complications</td>
<td></td>
</tr>
<tr>
<td>MN-Malnutrition</td>
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</tr>
<tr>
<td>Other (specify)</td>
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</tr>
<tr>
<td>3. Sex (Male/Female)</td>
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</tr>
<tr>
<td>4. Rural (R)/Urban (U)/Urban slum (US)</td>
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</tr>
<tr>
<td>5. Immunized for measles Y-Yes, N-No, CA-Could not assess</td>
<td></td>
</tr>
<tr>
<td>6. Was Vit A supplement given?</td>
<td></td>
</tr>
<tr>
<td>a) Before onset of measles</td>
<td></td>
</tr>
<tr>
<td>b) After onset of measles</td>
<td></td>
</tr>
<tr>
<td>(Total number of doses, CA)</td>
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</tr>
<tr>
<td>7. MALT: Number of vaccinations</td>
<td></td>
</tr>
<tr>
<td>a) None</td>
<td></td>
</tr>
<tr>
<td>b) Gal. 1, Gal. 2, Gal. 3, Gal. 4</td>
<td></td>
</tr>
</tbody>
</table>

Note: The investigation, Etc.