MINISTRY OF HEALTH

REPUBLIC OF KENYA

DIVISION OF DISEASE SURVEILLANCE AND RESPONSE

GUIDELINES FOR MEASLES SURVEILLANCE AND OUTBREAK RESPONSE

Revised April 2013

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FOREWORD

The Ministry of Health is committed to the reduction of child morbidity and mortality due to measles by 90% and 95% respectively by 2005 through implementation of accelerated measles control strategies. Measles Control is a measure of achieving the fourth millennium development goal.

The Ministry of Health is striving to achieve the target through implementation of integrated approach of the strategies with other development partners and stakeholders; the community being core in ensuring that all children are immunized against measles by their first year of life; and providing a second opportunity through supplemental immunization activities (SIA). Kenya is also in the process of introducing a second dose of measles in the routine immunization schedule as a way of ensuring herd population immunity against measles. Measles was among the top 5 causes of child morbidity and mortality in Kenya until June 2002 before the implementation of the Catch-up campaign.

In order to reduce the measles incidence, active and quality surveillance for the same is paramount for early detection, investigation, proper case management for prevention of complications and deaths and early detection of looming outbreaks.

Ministry of Health (MOH) together with other collaborating stakeholders have come together to improve on this guidelines for the achievement of accelerated measles control. The first measles surveillance case based guidelines were developed and implemented in June 2002. After 4 years of implementation of these guidelines it has become imperative to review and update them based on experiences and observations from the field. This guide has been improved with adaptation from the "WHO/AFRO Guidelines for measles surveillance (Revised April 2011)".

These guidelines are intended to update the knowledge and skills of all practicing health care providers in all health institutions towards the implementation of accelerated measles control/elimination in Kenya.

Dr James W Nyikal MBS
Director of Medical Services

ACKNOWLEDGEMENT

The Ministry of Health recognizes the efforts and commitment put towards the review and development of these guidelines. It is a product of concerted partnership and efforts of the various divisions in the Department of Preventive and Promotive Health Services as well as Department of Curative and Rehabilitative Health Services. The following officers actively participated in review of this guideline; Dr. Ian Njeru – Head DDSR, Johnny Musyoka National Disease Surveillance Coordinator, Florence Yonga –Measles Focal Point, Yusuf Ajack – Measles data Manager, Juliet Mungai and Titus Kolongei – Polio desk, Amina Ismael – Hib/ Rota Virus desk .

Many thanks go to the following: Division of Vaccines and Immunization Services, Child Health, Environment Health and Clinical Services. The Ministry also appreciates contribution of Kenya Medical Research Institute (KEMRI), Nairobi (UoN), Kenya Pediatrics' Association (KPA), Africa Medical and Research Foundation (AMREF) and UNICEF.

In reviewing this guideline, the World Health Organization Africa Region Measles Surveillance Guideline (2004) recommendations were considered. Finally the Ministry acknowledges the financial and technical support from WHO Kenya Country Office in reviewing and production of this guideline.

EXECUTIVE SUMMARY

The MOH implemented a nationwide measles catch-up campaign in June 2002 targeting more than 13 million children between 9 months and 14 years. The objective of reaching over 95% of the target population was achieved and this together with maintaining the routine measles immunization coverage at 90% and above was expected to bring the incidence of measles transmission from high to low.

Measles cased based surveillance was established immediately after the campaign. To facilitate a common standard operating procedure, guidelines were developed and all heath workers at all levels trained on the implementation of this strategy.

The process entails early detection of suspected cases of measles through the use of standard case definitions both by the health workers and the community. It has steps and procedure of collection and transportation of the serum for confirmation of the disease.

The Laboratory (KEMRI) is an important integral component in this process in confirming the measles IgM antibodies and determining the circulating virus especially during outbreaks; whether indigenous or imported. Suspected and confirmed cases require to be promptly managed using the IMCI approach.

The National, Provincial, County and District/Sub-County levels should monitor the trend and epidemiological process of the disease by monthly analysis of the data from the cases in terms of time, place and the affected persons.

This intervention is monitored through some process indicators set by the World Health Organization (WHO).

INTRODUCTION

The country has adopted and is implementing the Integrated Disease Surveillance and Response (IDSR), which emphasizes the reporting of forty one priority communicable diseases. These diseases include epidemic prone diseases, diseases targeted for eradication and elimination and diseases of public health importance.

DISEASE SURVEILLANCE

Surveillance is the ongoing systematic collection, analysis and interpretation of outcome-specific data for use in planning, implementation and evaluation of public health practice. Disease surveillance is a critical component of measles control and elimination efforts and is used in the assessment of progress and in making adjustments to programmes as required.

Types of disease surveillance:

Disease surveillance is a key component of control programs and serves as the means of monitoring program success. In routine surveillance systems, data on individual patients, which are recorded in patient registers, are used to calculate the number of cases of reportable diseases diagnosed by health facility staff over a certain period of time. These data are periodically reported to district authorities that compile and send them to higher administrative levels. This process of detecting and reporting information on diseases that bring patients to the health facility is known as **passive surveillance**.

Passive surveillance yields only limited data because many sick people do not visit a health facility and because those cases may not be correctly classified, recorded, or reported.

One way to overcome the limitations of passive surveillance and obtain more reliable and accurate data about the disease burden in the community is for surveillance officers to regularly visit the most utilized health facilities and traditional health care delivery points. These visits will help to ensure that all cases are notified and reported in time. Surveillance officers can also look for cases of a specific disease at community level. This process is known as **active surveillance**. Since passive surveillance has limitations due to its lack of access to some groups within the population, active surveillance is often used to enhance the completeness of a passive surveillance system.

When there is a suspected case of a disease targeted for eradication/ elimination/ accelerated control (such as polio or neonatal tetanus or measles respectively) or during suspected outbreaks of epidemic - prone diseases, health workers conduct case-based investigations to learn more about a specific disease pattern. In such cases, health workers use the epidemiologic case definitions to identify suspected cases, and proceed to record information such as the patient's name, age, vaccination status, district and village of residence, date of disease onset, and to take appropriate specimens for laboratory Confirmation if necessary.

MEASLES SURVEILLANCE

The objectives of the measles surveillance in the accelerated control of measles are to

1. Identify and investigate outbreaks
2. Predict outbreaks through the identification of geographic areas and age groups at risk,
3. Evaluate and guide vaccination strategies in order to improve measles control efforts.

Globally measles accounts for more than 30 million cases and 0.9 million deaths every year, approximately half of which occur in Africa. Measles is among the top five causes of death in children less than 5 years of age in

many African Countries. Before the widespread availability of measles vaccine, virtually all children contracted the disease.

It is estimated that in the year 2000, 1.6 million children died from vaccine preventable diseases worldwide and 48% (>750,000) of those deaths were attributable to measles. Measles vaccine provides long-term immunity against the virus. Adequately chosen and implemented vaccination strategies not only reduce mortality and morbidity but also interrupt the transmission of indigenous measles virus.

In the pre-immunization era, nearly every child in Kenya contracted measles before the age of two years. During this time, annual epidemics occurred, especially during the cool wet months between May and October. The advent of the Kenya Expanded Program on Immunizations (KEPI) in 1980 and the high immunization coverage in subsequent years led to a dramatic decline in the reported measles morbidity and mortality.

The Ministry of Health (MoH) has adopted the World Health Organization (WHO) and United Nations Children's Emergency Fund (UNICEF) Measles Mortality Reduction Elimination Strategic Plan, 2001-2005, which outlines the following strategies for reducing measles mortality:

- Provide the first dose of measles vaccine to all infants at 9 months;
- Ensure that all children have a second opportunity for measles vaccination through Supplemental Immunization Activities (SIAs).
- Enhance measles surveillance with integration of epidemiological and laboratory confirmation;
- Improve the management of every measles case with Vitamin A supplementation and treatment.

In June 2002, Kenya implemented a nationwide catch-up measles campaign to immunize all children between 9 months and 14 years of age. As a result of this Supplemental Immunization Activity (SIA), coverage rates for measles in Kenya for children in this age group were estimated to be > 96%. After this SIA Campaign Kenya was expected to transition Kenya from a country with moderate to high measles incidence to one of low incidence.

The challenges for accelerated measles control include:

- Achieve and maintain high routine immunization coverage in all districts; (>80%).
- Timely implementation of follow up SIAs
- Achieving and sustaining reduction of measles morbidity and mortality by 90% and 95% respectively.
- Getting complete surveillance data
- Timely and appropriate response to outbreaks

THE ORGANISM, THE DISEASE AND THE VACCINE

THE ORGANISM

Measles is a highly infectious disease that causes mortality in both developing and industrialized countries. Measles is an acute illness caused by a virus of the genus *Morbillivirus*, a member of the family of paramyxoviridae.

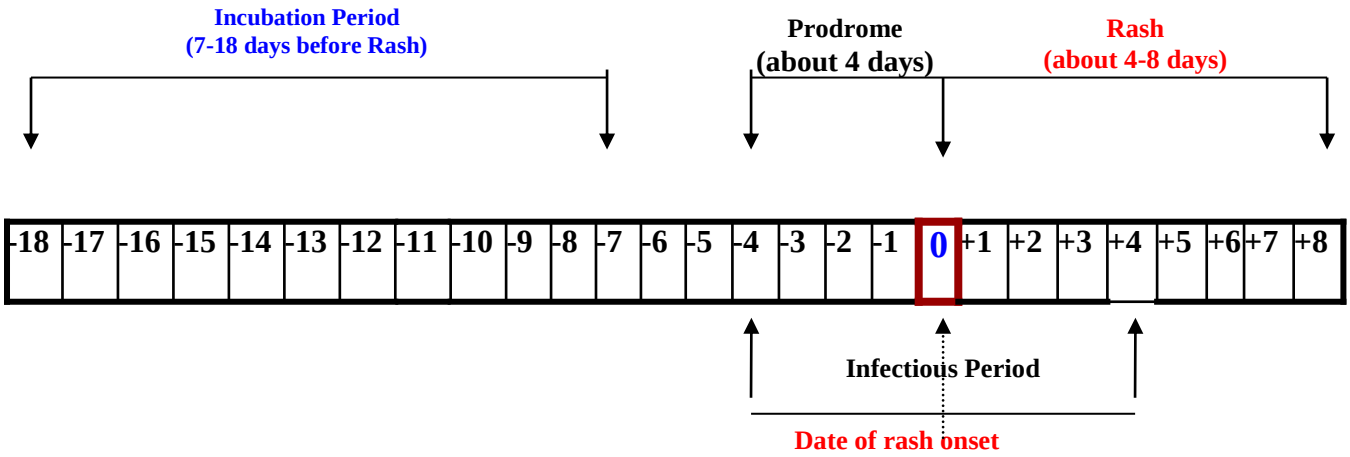
TRANSMISSION

Measles is one of the most infectious of human diseases. The virus can be transmitted in the air through respiratory droplets, or by direct contact with the nasal and throat secretions of infected persons.

CLINICAL FEATURES

The incubation period for measles usually lasts for 10 to 12 days but ranges from 7 to 18 days (see graphic below). A prodrome, consisting of fever, malaise, cough, coryza (runny nose), and conjunctivitis (red eyes) begins 3 – 4 days prior to rash onset. The infectious period is usually 4 days before until 4 days after the date of rash illness.

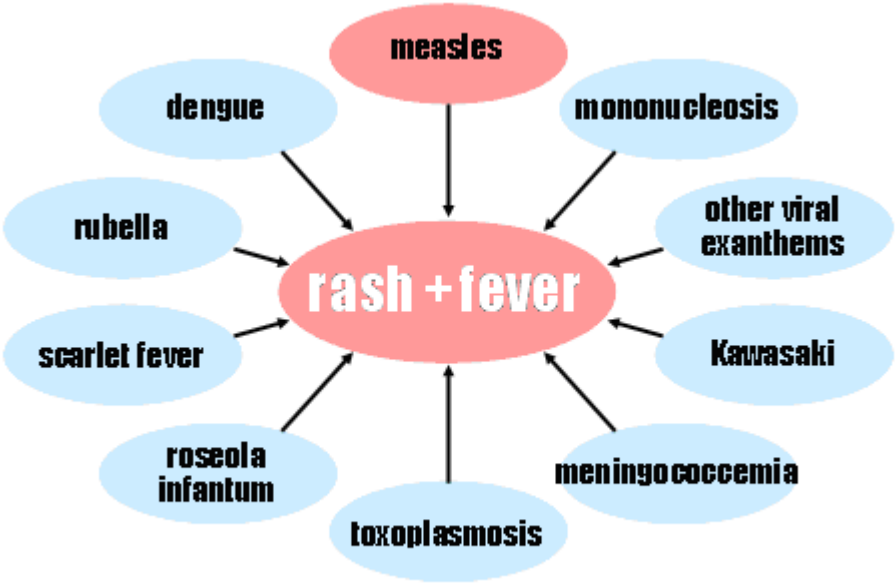
CLINICAL COURSE OF MEASLES



Koplik spots may occur on the buccal mucosa shortly before rash onset and for about 1 to 3 days subsequently. However, the absence of Koplik spots does not rule out measles. Within 2 to 4 days after the prodromal symptoms begin, a rash of large, blotchy red spots, called a *maculopapular rash*, appears behind the ears and on the face. At this stage a high fever develops, the temperature possibly reaching 40.6^0 C (105^0 F). The rash spreads to the trunk and extremities, typically lasts for 3 to 7 days and may be followed by a fine desquamation. A non-productive cough is present throughout the febrile period, and lasting for 1 to 2 weeks in uncomplicated cases.

DIFFERENTIAL DIAGNOSIS

The standard case definition in use currently is not highly specific. As a result there are many conditions that have the same presentation like measles. The chart below shows some of those conditions.



In Kenya, the commonest differential diagnosis for measles is rubella, accounting for close to 40% of the investigated cases.

MEASLES COMPLICATIONS:

Many children experience uncomplicated measles. However, in about a third of the cases, measles is followed by at least one complication caused by disruption of epithelial surfaces and immunosuppression.

These include pneumonia, ear and sinus infections, mouth ulcers, persistent diarrhea, upper airway obstruction from croup (laryngo-tracheo-bronchitis). Less common complications include corneal drying that could progress to ulceration (keratomalacia) and blindness, protein energy malnutrition, convulsions and brain damage. Complications are more common in young children below 5 years of age. Unless managed early and aggressively, these complications may lead to death within the first month after the onset of rash. The case fatality from measles is estimated to be 3 – 5% in developing countries but may reach more than 10% in epidemics.

The highest case fatality rate occurs in infants under 12 months of age and can reach 20 – 30%.

IMMUNITY AND MEASLES VACCINE

Natural infection produces lifelong immunity. Infants born to mothers who have either had measles or been vaccinated are protected by trans-placentally acquired maternal antibodies(passive immunity).This protection lasts six to nine months on average, after which the child becomes susceptible to measles infection.

Measles vaccines are live, attenuated virus preparations. Measles antibodies develop in approximately 85% of children vaccinated at 9 months of age, 95% of children vaccinated at 12 months of age, and 98% of children vaccinated at 15 months of age. In consideration of the epidemiology of measles in Kenya, the Ministry of

Health policy is to administer the first dose of measles vaccine at 9 months of age and to provide an opportunity for a second dose of measles vaccine during supplemental immunization activities. Measles vaccine provides life long immunity in most people. A high proportion of vaccinated persons who lack detectable antibody after one dose of measles vaccine respond to a second dose. As stated earlier, Kenya immunization program is in the process of introducing a second dose of measles in the schedule.

MEASLES SURVEILLANCE OBJECTIVES

Surveillance data are essential to:

- Describe the characteristics of measles cases in order to understand the reasons for occurrence of the disease and develop appropriate control measures;
- Predict potential outbreaks and implement vaccination strategies in order to prevent outbreaks;
- Monitor progress toward achieving disease control and elimination goals;
- Provide evidence that, in countries with low measles incidence, the absence of reported cases is attributable to the absence of disease rather than to inadequate detection and reporting.

Kenya has developed these guidelines to follow a long-term measles elimination strategy that includes a surveillance system able to respond to changes in measles incidence. Case-based measles surveillance has been implemented following the June 2002 national measles vaccination campaign.

Kenya plans to use surveillance data to:

a) Detect and investigate outbreaks so as to ensure proper case management;

b) Determine why outbreaks have occurred (e.g., failure to vaccinate, vaccine failure, accumulation of susceptible persons);

c) Identify high-risk populations;

d) Determine when the next outbreak may occur because of a build-up of susceptible persons;

e) Determine where measles virus is circulating or may circulate (i.e., high-risk areas);

f) Assess the performance of the surveillance system (i.e., reaction time for notification, specimen collection) in the detection of virus circulation or potential importation;

g) Identify areas where it is necessary to strengthen surveillance, based on performance indicators.

MEASLES OUTBREAK

1. A single suspected case of measles requires immediate investigation.
2. ***A suspected outbreak of measles*** is defined as the occurrence of 5 ***or more reported suspected*** cases of measles in a district in a month (4 consecutive weeks).
3. ***An outbreak of measles*** is confirmed when there are ***3 or more Measles IgM positive*** cases in district in a month.

ROLE OF THE COMMUNITY (SCHOOLS, COMMUNITY LEADERS, PARENTS AND SIBLINGS, ETC.):

1. **Identify and report cases meeting the following lay case definition to the nearest health facility/authority or area Chief/Assistant Chief.**

Lay measles case definition
Any person with rash and fever.

2. **Take the affected person to the nearest health care facility for medical attention**
3. **Ensure all children aged 9 months to 5years who have not had measles vaccine are vaccinated**
4. **Assist the District Disease Surveillance Team in responding to outbreaks.**

ROLE OF THE HEALTH CARE PROVIDER:

1. **Identify suspect cases of measles based on the standard case definition**

Standard Definition of Suspect Measles Case

Person with:
Maculopapular rash;
Fever; plus
One of the following: Cough; Coryza (runny nose); or Conjunctivitis (red eyes).
Or any person in whom a clinician suspects measles.

2. U

a. Begin case management for measles.

- Give 2 doses of vitamin A to prevent complications according to the following table:

Age	Dose of Vitamin A	
	Immediately on Diagnosis	**Next Day**
< 6 months	50,000 IU	50,000 IU
6 – 11 months	100,000 IU	100,000 IU
12 months	200,000 IU	200,000 IU

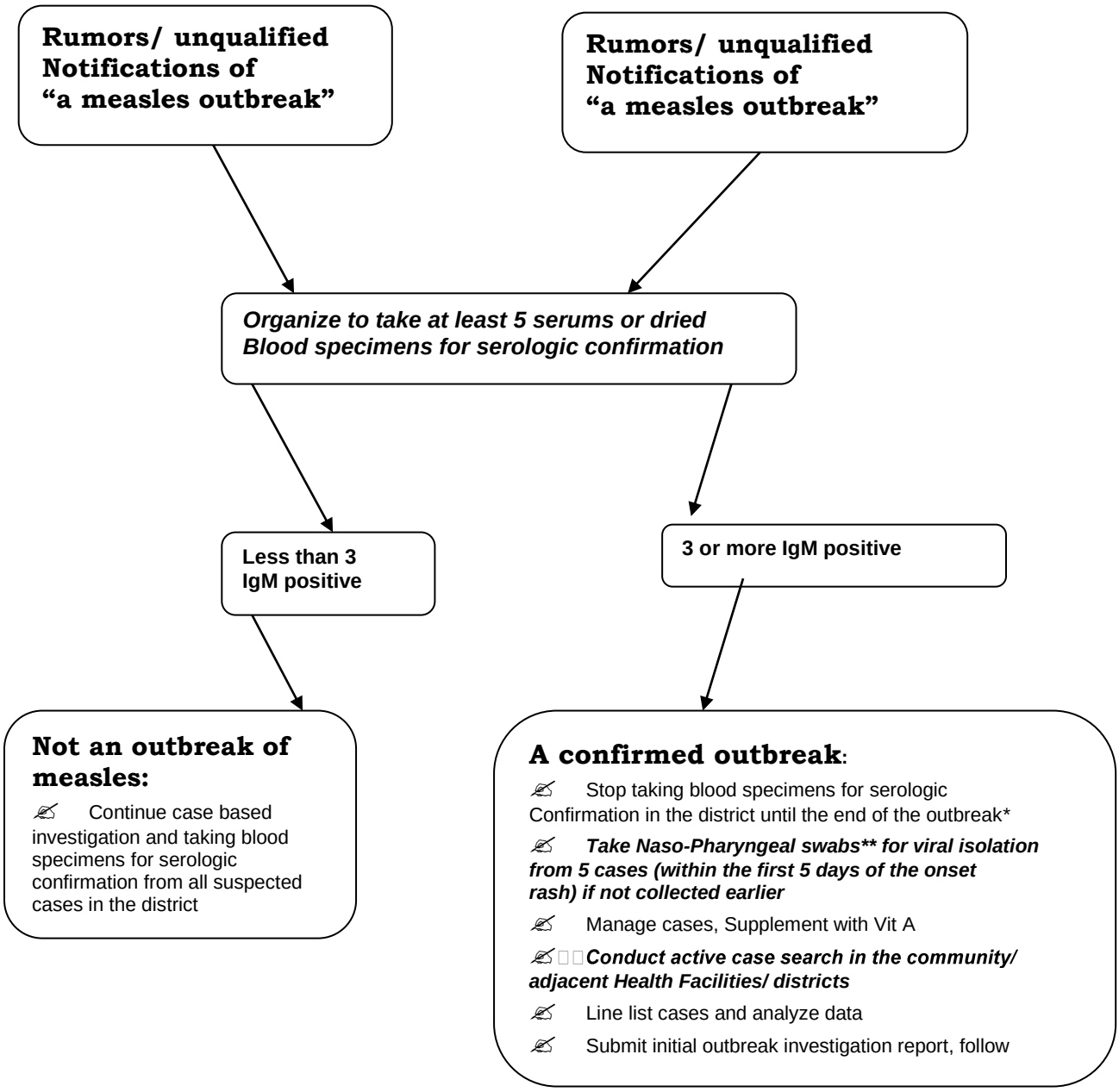
Note: For ocular manifestations other than conjunctivitis (e.g., corneal dryness), give a 3rd dose of Vitamin A 2 – 4 weeks after the 2nd dose.

- Encourage increased fluids and do not withhold food.
- Treat symptoms (fever, itchy skin, etc.).
- Treat complications or secondary infections, if present. This may include administration of tetracycline eye ointment, oral antibiotics and GV mouth paint for oral sores.
- Arrange for isolation of the patient to the extent possible, up to the 4th day from the date of onset of rash.
- If the patient is hospitalized ensure that all children 6 –59 months of age in the health facility at the same time as the suspect measles case have received a dose of measles vaccine. Remember to advice the mothers of those children below 9months of age to come back at 9 months for the routine measles vaccination (this should be at least a month after the first dose).
- If the patient is sent home, tell the family to keep the patient at home and discourage close contact with other children /people until after the 4th date of onset of rash as the case is highly infectious during that period.

b. Fill out the Integrated Case-Based Surveillance Form (Annex 1) with the appropriate basic demographic and clinical information.
   - Send copy 1 with the serum specimen to KEMRI Measles Reference Laboratory.
   - Send copy 2 to the Provincial Medical Officer.
   - Give copy 3 to the District Medical Officer.
   - File copy 4 at the facility.

3. Collect a serum sample according to the guidelines (see Annex 1).

Flow Chart for Suspected /Confirmed Measles Outbreak



** An outbreak of measles in a district is said to have come to an end when there has not been a suspected cases of measles seen for more than 3 weeks after the last reported case (s) and when all neighboring districts have also not reported any case for a similar period of time.*

** Nasopharyngeal swabs will be taken after lab confirmation and should be done by the national team**. (Annex 5)**

4. Notify the District Medical Officer of Health of the suspected measles case within 24 hours.

5. Role of the District Disease Surveillance Team

a) Notify the Provincial Medical Officer/ Provincial Disease Surveillance Coordinator and MoH Disease Outbreak Management Unit (DOMU) within 24 hours:
Contacts for DOMU

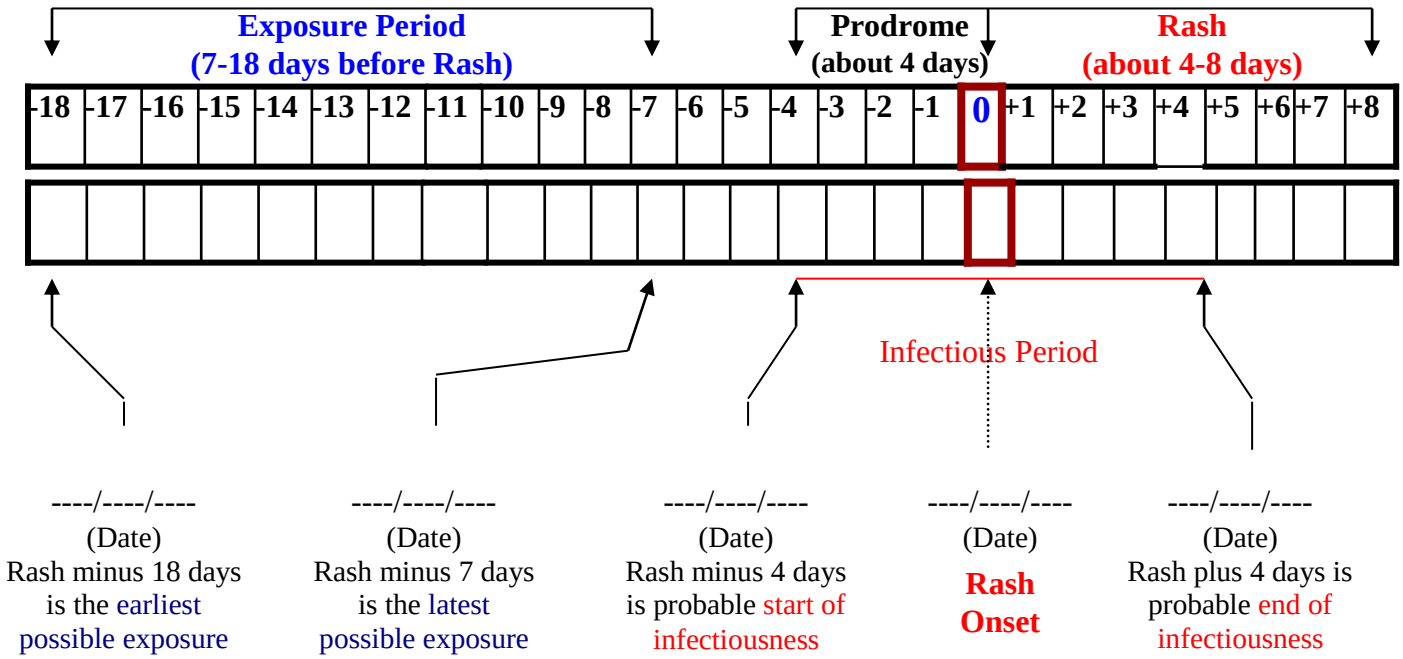
Phone: 02-2718292 or 02-2717077, ext. 45180

Fax: 02-2720533

Email: www.ddsr.or.ke

b) Confirm case and oversee outbreak response.

- Ensure that the serum specimen and a copy of the Integrated Case-Based Surveillance Form have been forwarded to KEMRI.
- Follow up laboratory results with Division of Disease Surveillance and Response , if not availed after 7 days
- Ensure that health facilities in the district have the following at all times:
  - Integrated Case-Based Surveillance Forms.
  - Line listing Form.
  - Optional Measles Contact Tracing Form.
  - Measles vaccine.
  - Specimen collection kits.
  - Confirm that the case meets the Standard Definition of Suspect Measles Case. Confirm the date of the case's rash onset. Then use the timeline (Active measles case finding pg.9) to determine the dates during which the case was likely exposed and the dates of the case's infectious period.
  - Active Measles Case Finding



c) Initiate active search for additional cases of febrile rash illness.

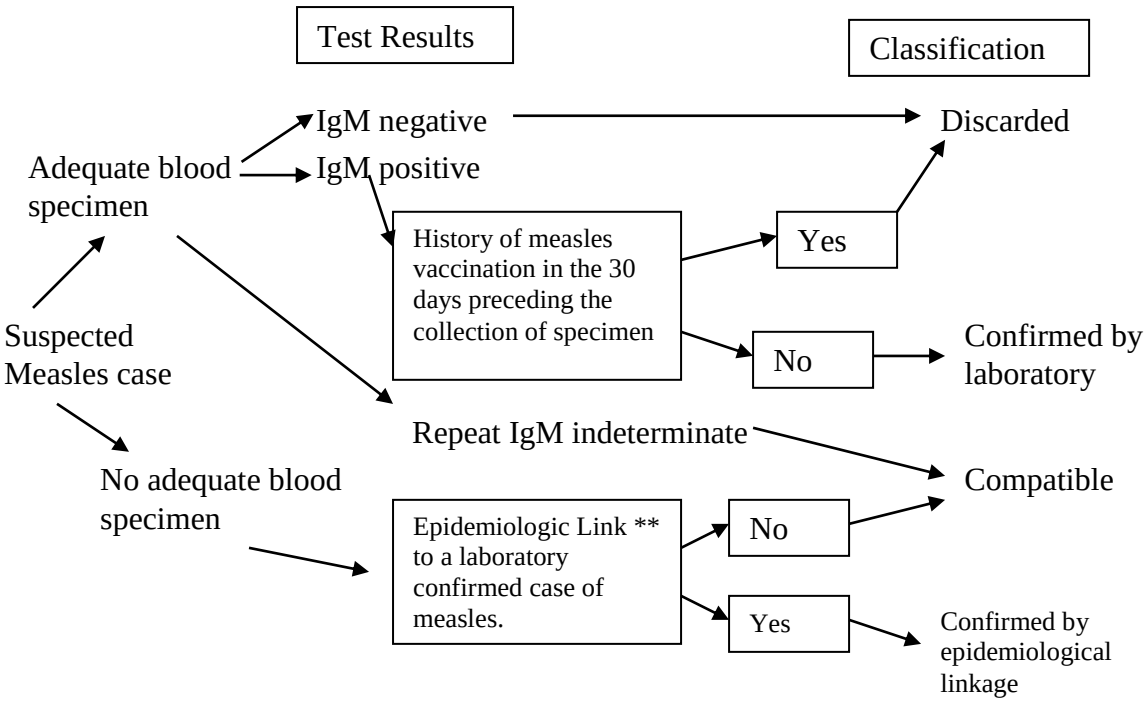
Initiate an active search for other cases in the village and other places visited by the index case during their infectious period (4 days before until 4 days after the date of rash onset). An optional Measles Contact Tracing Form (Annex 4) is provided to assist with case finding.

- Determine the patient's movements during the time they were likely to be *exposed* (in the 7-18 days prior to rash onset) and during their *infectious period* (4 days before rash onset until 4 days after rash onset). Use this information to map the areas for search for additional cases. Ask if the family knows of any additional cases of febrile rash illness.
- Line list all cases that have come in contact with the suspect case.
- If the index case had visited other districts during the period they were likely to have been exposed or during their infectious period, notify that district's Surveillance Team so they can initiate appropriate action in their district.
- Alert the village elders and provide them with the lay definition for suspect measles.
- All patients meeting the lay definition should be brought to the nearest health facility.
- Visit surrounding homes in the village to ask whether any cases of rash and fever have occurred during the previous month, and check the vaccination status of all children 9 – 59 months of age living in the households.
- Visit preschools, nurseries, schools, etc. in the area to find out if any febrile rash-illness cases have been occurring.
- Perform an ***active search*** for cases in health facilities in the area.
- Inform local health care providers, laboratories, pharmacies, traditional healers, etc. about cases of febrile rash illness and ask them to report any cases they see to the nearest health care facility or to the District Surveillance Team.

d) Ensure that health facilities in the district Collect a serum specimen and complete Integrated Case-Based Surveillance Form on *the first 5* suspected measles cases. Line list all suspected measles cases.

Case Classification Flow Chart for Measles Surveillance

For surveillance purposes, WHO AFRO recommends the following scheme for the classification of measles cases.



***** Fulfils the measles standard case definition; fever and maculo-papular generalized rash plus cough OR coryza OR conjunctivitis.

****** An adequate specimen is one collected upon first contact with a suspected measles case, **in the first 30 days of the onset of rash** and should be in **good condition2** (adequate volume for serologic testing, no leakage, not turbid from possible contamination, AND not dessicated) upon arrival at the laboratory.

******* Only if there is no history of measles vaccination in the 30 days preceding the collection of specimens.

******** Epidemiological linkage: meets suspect case definition and has contact with a laboratory-confirmed measles case whose rash onset was within the preceding 30 days (cases live in same district or adjacent districts with plausibility of transmission).

NB: Confirmation by epidemiological linkage should only be done in the context of Confirmed measles outbreaks.

Confirmed Measles:
Laboratory confirmed:
A suspected measles case that is investigated, including the collection of blood specimen, has serological confirmation of recent measles virus infection (measles IgM positive) and had not received measles vaccination in the 30 days preceding the specimen collection.

Confirmed by Epidemiological linkage:
A suspected measles case that has not had a specimen taken for serologic confirmation and is linked (in place, person and time) to lab confirmed cases; i.e., living in the same or in an adjacent district with a lab confirmed case where there is a likelihood of transmission; onset of rash of the two cases being within 30 days of each other.

1 All serum specimens with indeterminate measles IgM results should undergo a second test before being labeled "indeterminate" and being classified as "Compatible".
2 It is always advisable to avoid hemolysis when processing serum specimens in the field. However, hemolysis is not a reason for labeling specimens as being in "bad condition" when they are brought to the laboratory since it is known that hemolysis does not interfere with measles and rubella IgM testing using the Behring test kit.

Discarded/ not measles:
A suspected measles case that has been completely investigated, including the collection of adequate blood specimen, and lacks serologic evidence of recent measles virus infection (IgM negative) or is considered to have IgM positivity due to measles vaccination within the 30 days preceding the collection of a specimen.

Compatible Measles:
A suspected measles case that has not had a blood specimen taken for serologic confirmation and is not linked epidemiologically to any lab confirmed case of measles. Suspected measles cases that have no definite proof of recent infection (measles IgM test indeterminate repeatedly) may also be classified as compatible.
WHO AFRO recommends that all measles IgM negative and indeterminate sera undergo rubella IgM testing and that the results be appropriately documented in the database.

e) Identify and immunize susceptible contacts in areas searched for cases.

1) For districts with measles routine vaccine coverage below 80% outbreaks are expected and hence mob campaign is not a priority. Such districts should strive to improve routine vaccination coverage to at least 80% using the available resources. Emphasis should be more on case management, vitamin A supplementation and heightened surveillance.

2) Districts that have vaccination coverage of over than 80% ;Consider Immunizing all children aged 9 – 59 months who have not received *2 doses* of measles vaccine in areas neighboring the outbreak locality as these are the areas that the outbreak will most likely spread to (e.g., in nearby villages)(mob up vaccination). Children without a record of 2 doses should receive measles vaccine; report by history is not sufficient.
Note: *Doses of measles vaccine administered, as part of the outbreak response should not be counted as a routine dose.*

f) Notify the neighborhood, schools and districts about the occurrence of the suspect measles case(s) in the area.

g) Vaccinate all new refugees from the age of 6 months at the time of entry. Internally displaced people should all be vaccinated, from the age of six months, whenever there is a measles outbreak.

h) In an outbreak situation, vaccination age for measles is lowered to six months in the area of the outbreak. However, these children must be revaccinated at the age of nine months.

i) Write a summary report using the Integrated Disease Surveillance and Response (IDSR) District Outbreak Report Format (Annex 3) and submit copies of the final report to:

1) The Provincial Medical Officer;

2) Division of Disease Surveillance and Response.

3) Division of Vaccine and Immunization Services

4) The health care facilities involved; and

5) Disseminate the report at the Local Leaders Meeting.

j) Declaration of end of measles outbreak

An outbreak of measles in a district is said to be have come to an end when there has not been any new suspected case of measles seen for more than 3 weeks and when all neighboring districts have also not reported any case for a similar period of time.

ANNEX 1: SPECIMEN COLLECTION AND LABORATORY CONFIRMATION

HANDLING AND TRANSPORT OF BLOOD SPECIMEN FOR SEROLOGIC CONFIRMATION

Collect 5 ml blood by venepuncture into a sterile tube labeled with patient identification and Collection date. To separate the serum from red cells, one of the following three methods described below can be employed. To prevent bacterial over-growth, ensure that the serum is poured into a clean glass test tube. The test tube does not need to be sterile—just clean.

- Let the blood sit at an angle for at least 60 minutes (without shaking or being driven in a vehicle), then pour off the serum into a clean glass tube.
- If a refrigerator is available, put the sample in a refrigerator for 4 - 6 hours until the clot retracts, then pour off the serum the next morning.
- If a centrifuge is available, let the blood sit for 30-60 minutes, then centrifuge the specimen at 2000 RPM for 10 - 20 minutes and pour off the serum into a clean tube.

Do not freeze whole blood.

Storage and shipment of serum specimens:

Store serum at 2 - 8°C until it is ready for shipment. The serum can be stored in the refrigerator for a maximum of 7 days. Serum must be frozen at –20°C if it is going to be stored for longer periods. Filling case investigation forms completely.

Three dates are very important

- ✍ Date of rash onset
- ✍ Date of collection of sample.
- ✍ Date of last measles vaccination

Specimens must be shipped to the laboratory as soon as possible. Place specimens in plastic bags.

Specimens from different patients should never be sealed in the same bag. Place specimen form and investigation form in another plastic bag and tape to inner top of the specimen transport box. If using ice packs (these should be frozen), place ice packs at the bottom of the box and along the sides, place samples in the center, then place more ice packs on top. When shipping arrangements are finalized, inform receiver of time and manner of transport.

Call KEMRI (2 –717221 or (2 –726115 or 2-722541 ext. 2265) to notify them that a specimen is being delivered.

If you have questions concerning serum specimen collection, storage or transportation, call KEMRI at the numbers above.

If you are unable to send the serum specimen to KEMRI, notify the District Medical Officer immediately.KEMRI/KEPI will send a report of the results through the PMO/PDSC to be conveyed to the District Medical Officer/reporting health facility within 7 days of specimen receipt at the lab.

2013 **MINISTRY OF HEALTH KENYA** **MOH 502**

Integrated Case Based Surveillance Form

NB. Use this form for a single case only

(To be completed at the National level)

FPID No: ……. ……..… ……. ……..

Country County District Year

Date form received at national level _____/_____/_____

A. Name of Site Reporting & Disease being reported

A1. Health Facility …… **A2**. Type ……

A3. District …… **A4**. County ……

A5. Disease reported (Tick One)

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

AFP NNT Measles Meningitis Plague VHFs Yellow Fever S. AI Other (Specify) ……..

NB: If you suspect AI, Please fill the Avian Influenza Case Investigation form

B. Identification

B1. Name of patient ……

B2. Sex: 1 = Male 2 = Female **8**. Age (Yrs/Months/Days: ___/__/___ **B3**. D.O.B. ____/___/___

B4. Residence: ☐ Urban ☐ Rural

B5.Tracer information:

a. Parent/Guardian: ……

b. Residence (Village/Hse No): ……..……

c. Neighborhood major landmark: ……..……

d. Street/Plot/Estate/S. loc: ……..…

e. Town/City/Loc: ……

f. District: …… County: ……..……

g. Telephone No: ……

C. Clinical Information

C1. Date of onset of illness _____/_____/_____

C2. Date first seen at health facility: _____/_____/_____

C3. Date Health facility notified District level: ____/_____/_____

C4. Hospitalized: 1= Yes 2=No Date of Admission _____/___/____

C5. IP/OP No. ……

C6. Diagnosis: ……

C7. Means of diagnosis: ☐ Clinical ☐ Lab ☐ Epi linkage

☐ Other (specify): …….

C8. Vaccination History for disease under investigation [Measles, AFP (exclude birth dose of OPV), NNT(TT in mother), Yellow fever, Meningitis and suspected Avian Influenza]

a. Was the patient vaccinated against illness? 1 = Yes 2=No
9= unknown. If yes, no of doses: ……

b. Any vaccination given in the last two months? 1= Yes 2= No 9= unknown. Date of vaccination ____/___/___N/A

C9. Status of the patient:

☐ Still hospitalized ☐ Discharged ☐ Dead

D. For Acute Flaccid Paralysis (AFP) Case Only

D1. Date of onset of paralysis: _____/_____/_____

D2. Signs and symptoms: 1 = Yes 2 = No

☐ Fever at onset of paralysis ☐ Sudden onset of paralysis

☐ Paralysis progressed < 3 days ☐ Flaccid (floppy)

D3. Site(s) of paralysis: ☐ Left leg ☐ Right leg ☐ Left arm ☐ Right arm

D4. **Follow-up Examination** (to be completed by the district 60-90 days after onset of paralysis)

a. Date of follow-up examination: ____/_____/_____

b. Site(s) of paralysis: ☐ Left leg ☐ Right leg ☐ Left arm ☐ Right arm

c. Findings at follow-up

☐ Residual paralysis ☐ No residual paralysis

☐ Lost to follow-up ☐ Death before follow-up

d. Name and designation of person doing the follow-up: ……..
……..

E. For Neonatal Tetanus Case Only

E1. Delivery practices

a. Where was the baby delivered?

☐ Health facility (Name): ……

☐ Home by trained attendant ☐ Home by untrained attendant

☐ Unknown

b. Was the cord cut with sterile/clean blade?
1=Yes 2=No 9=Unknown

c. How was the cord stump treated or dressed? ……..

E2. Baby's symptoms

a. How old (in days) was the baby when the symptoms began?
☐ Days ☐ Unknown

b. At birth, did the baby suck normally? 1=Yes 2=No 9=Unknown

c. Was the case confirmed as neonatal tetanus (if yes to the last 3 questions)? 1=Yes 2=No 9=Unknown

E3. Treatment

a. Was the baby treated at a health facility? 1=Yes 2=No 9=Unknown

b. Is the mother alive? 1=Yes 2=No 9=Unknown
(If no, complete case investigation form for maternal deaths)

E4. Case Response: Sensitize TBAs and community leaders on safe delivery practices and cord care. Provide booster TT doses to mother of NNT case and women of child-bearing age in community

a. Did case response for the mother take place? 1=Yes 2=No 9=Unknown

c. Did a case response take place in her community? 1=Yes 2=No 9=Unknown

d. Comments: ……..
……

F. For Measles Case Only

F1. Presence of fever: 1=Yes 2=No

F2. Date of onset of rash: _____/_____/_____

F3. Type of rash: ☐ Maculopapular ☐ Other

F4. Was home of patient visited for contact investigation?

☐ Yes (Date): _____/_____/_____ ☐ No

F5. Is the case epidemiologically linked to a lab-confirmed case? ☐ Yes

☐ No ☐ Unknown

G. laboratory Information

G1. Specimen collection *(To be completed by the health facility)*

If lab specimen was collected, complete the following information and send a copy of this form to the lab with the specimen

a. Was specimen collected? 1=Yes 2=No
If no, why? ……..
……

b. Date(s) of specimen collection: _____/_____/_____

c. Specimen type: ☐ Stool ☐ Blood ☐ CSF ☐ OPS ☐ NS ☐ Animal tissue ☐ Other (specify): ……

d. Date specimen send to the lab: _____/_____/_____

e. Name of the lab: ……

G2. Lab results

a. Lab results:

☐ Received (provide)……

☐ Not yet received

H. District Contact Person

H1. Form completed by: ……
Designation: …….... Sign: ……

H2. District contact person details:
Name: ……..
Designation: …… Phone No: ……..
Email: ……

Final Laboratory Results

(Please indicate the final laboratory results in detail)

NS: Nasal Swab

OPS: Or pharyngeal Swab

S. AI: Suspected Avian Influenza

ANNEX 2: HEALTH FACILITY LINE-LISTING FORM

MOH 503

Health Facility: _____ District: _____ Date received at District: _____
Province: _____ Disease/Condition: _____

A	B	C		D	E	F	G	H	I	J			K		L
	Names	Patients (tick as appropriate)		Village or Town and Neighborhood INDICATE Major Landmarks	Sex	Age[1]	Date seen at health facility	Date of onset of disease	Number of doses of vaccine (Exclude doses given within 14 days of onset)	Lab Tests			Outcome		Comments
		Out patient	In patient							Specimen taken (Yes/No) If yes, date collected		Lab results	A-Alive	D-Dead	
										Date	Type				
(1)															
(2)															
(3)															
(4)															
(5)															
(6)															
(7)															

[1] *Age in years if more than 12 months, otherwise indicate number of months e.g. 4m, 7m.*

ANNEX 3: MEASLES CONTACT TRACING FORM

Date of investigation: ----------

Investigated by: ----------

Residence or institution investigated: ----------

District or neighborhood: ----------

Name	Age Y=Years M=Month	Sex M/F	Total number of measles vaccine doses and date of last one	Suspect case of measles (Yes/No)	If suspect case of measles					Other observations: a)Does suspected case work in tourist industry or had contact with foreign visitors within 7-18 days before rash onset? b) Record address if different from others
					Date of rash onset	Date Serum Sample taken	Lab result (pos/ neg)	Places visited 7-18days before rash onset (where suspected case could have been infected)	Places where the case had been 4 days before until 4 days after rash onset (infectious period)	

* All usual residents of or visitors to the house or workplace must be visited (including all persons visiting at least weekly)

** Immunization card is required. If it is not available, record "unknown" in this column.

Interview all persons who live (or work) there and those who visited this home/workplace within 7-18 days prior to rash and onset/or since beginning of first respiratory symptoms up to 4 days after rash onset. Also interview here the case- patient that originated the investigations.

ANNEX 4: PERSON ANALYSIS TABLES FOR CASE-BASED MEASLES DATA

Data for the month/year of _____ Data from (block or country) _____

Data manager: _____

Table 1. Age distribution

(Measles confirmed cases only; lab and Epi link)

Age	*Number (#)*	*percentage (%)*
< 9 months		
9 – 11 months		
1 – 4 years		
5 - 9 years		
10 – 14 years		
15+ years		
Subtotal		
Missing		
Total confirmed		

Table 2. Vaccination status

(Measles confirmed cases only; lab and Epi link)

Number of vaccine doses taken	*Number (#)*	*percentage (%)*
0 (not vaccinated)		
1		
2		
3		
Unknown		
Subtotal		
Missing		
Total confirmed		

Table 3.Inpatient /outpatient status

(Measles confirmed cases only; lab and Epi link)

In/outpatient status	*Number (#)*	*percentage (%)*
Inpatient		
Outpatient		
Subtotal		
Missing		
Total confirmed		

Table 4.Measles IgM Lab results

(Only for cases with blood specimen)

Lab result *Number (#)*	*percentage (%)*
IgM positive	
IgM negative	
Indeterminate	
Subtotal Pending results	
Total with specimen taken	

Table 5. Final classification

(All reported cases)

Final classification	*Number (#)*	*percentage (%)*
Lab confirmed (IgM +ve)		
Confirmed by epidemiologic linkage		
Compatible (reported cases without blood specimens)		
Discarded (IgM –ve)		
Lab result pending		
Missing		
Total reported		

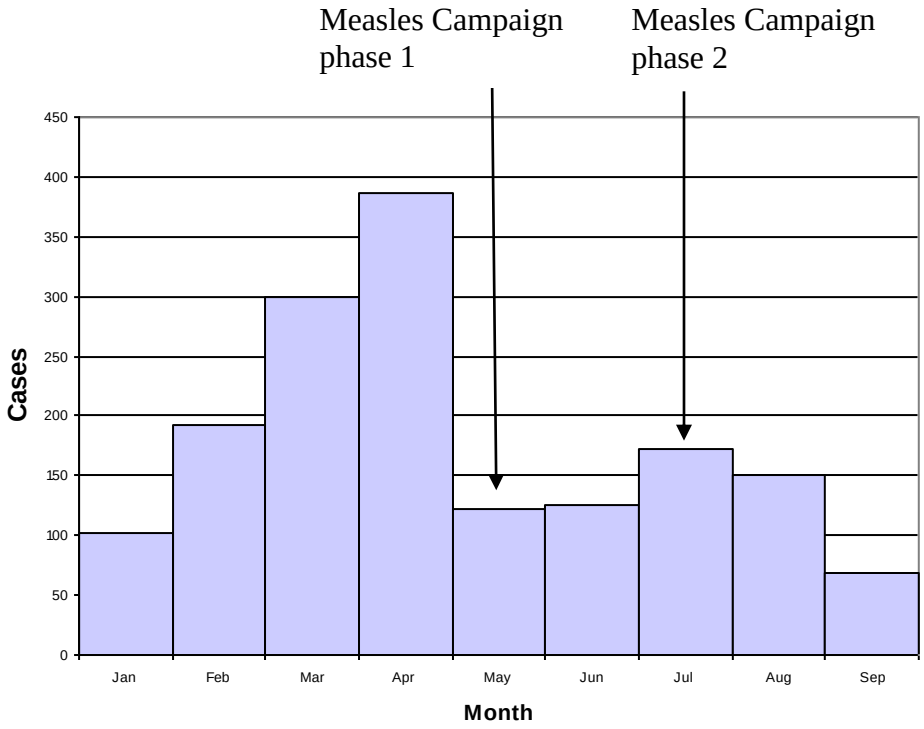
Table 6. Outcome

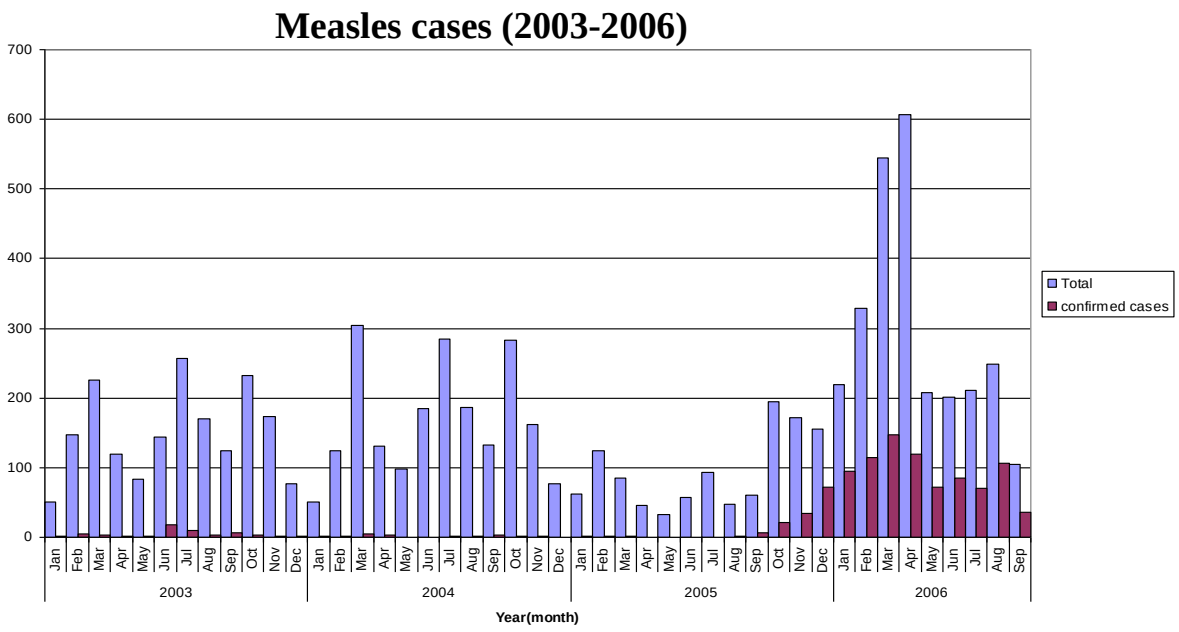
(Measles confirmed cases only; lab and Epi link)

Final outcome	*Number (#)*	*percentage (%)*
Alive		
Dead		
Unknown		
Total confirmed		

ANNEX 5: EPIDEMIC CURVE FOR CONFIRMED MEASLES CASES

Measles cases in 2006



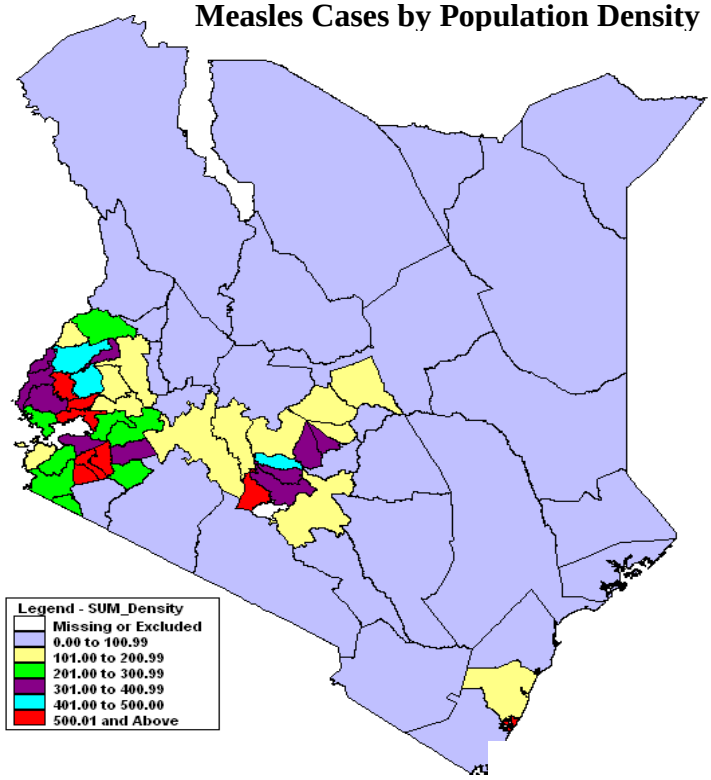


With arrows and date labels indicate the following on the epi curve;
1. Probable date of first case (found retro as a result of investigation)
2. Date first case was seen at a health facility
3. Date district was notified of the outbreak
4. Date district investigated the outbreak
5. Date district notified national level of the outbreak

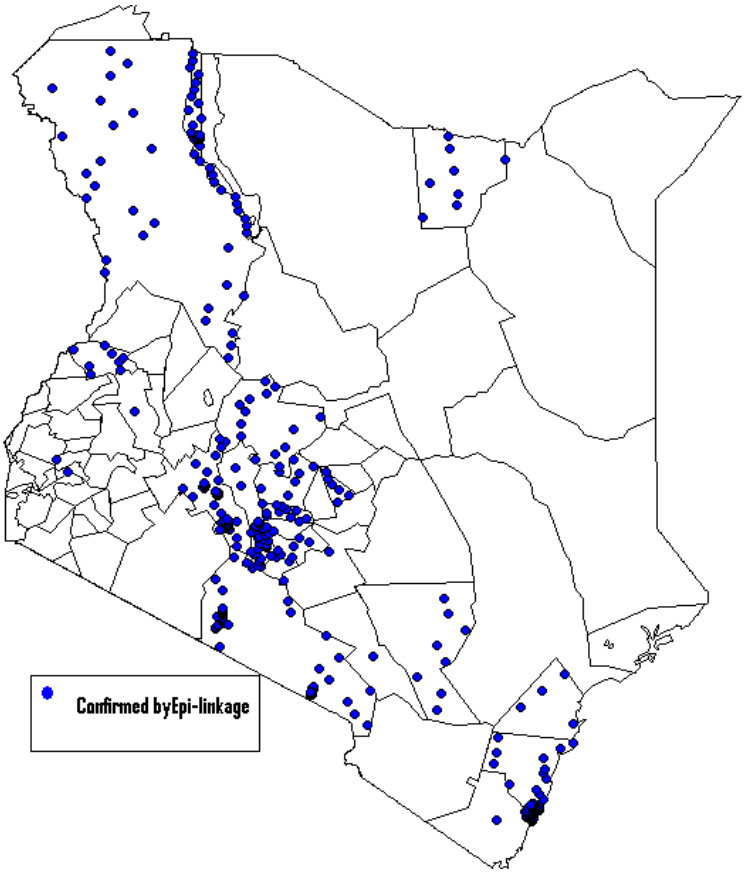
(NOTE: these dates match those in the "District log of suspected outbreaks and rumors"

ANNEX 6: A STANDARD MEASLES MAP (EXAMPLE)

Measles Cases by Population Density



Measles Cases confirmed by Epi-Linkage



ANNEX 7:DISTRICT OUTBREAK REPORT FORMAT

1. Disease/Condition _____

2. Period _____

3 Place –Province ---------- District---------- Division----------
Location---------- Sub-Location----------Village----------

4. Executive summary:

5 Introduction:
Background: Reasons for investigation (public health significance, threshold met, etc.)
Investigation and outbreak preparedness:

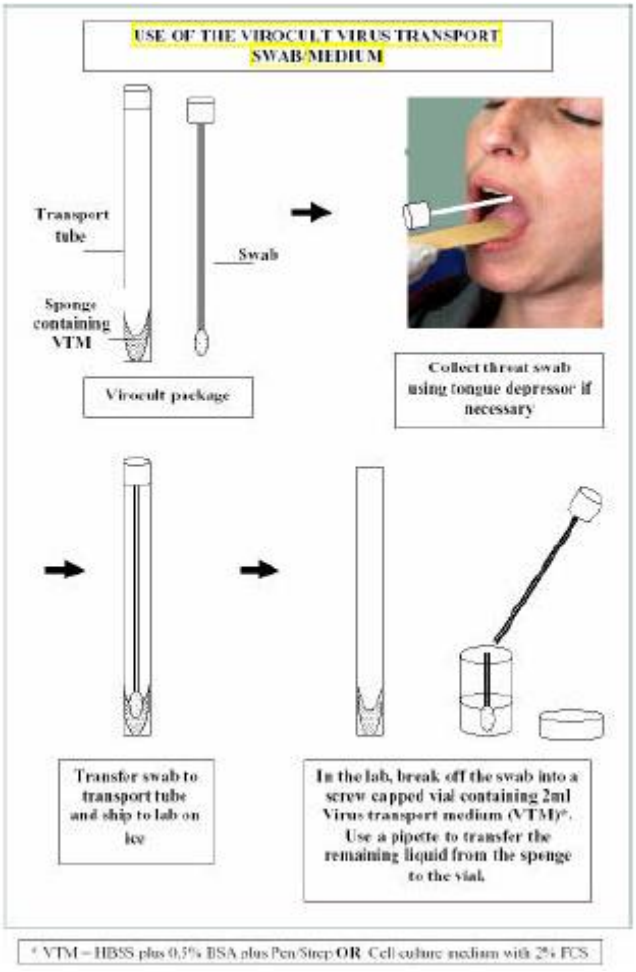
6. Methods:
Dates of investigation:
Site(s) of investigation (health care facilities, villages, other):
Case finding (indicate what was done regarding case finding, e.g., register review, and contact investigation, alerting other health facilities, other)
Lab specimens collected:
Describe response and intervention (include dates):

7. Results:
Date and location of first known (index) case:
Date and health facility of first case seen by the health care system
Results of additional case finding:
Lab analysis and results:
With text, describe key features of results of time, place, and person analysis
For detailed results by time (epidemic curve), place (map), and person characteristics
(Table) and line list (refer to section 3 for details)
Results of response and evidence of impact.
Interpretations, discussion, and conclusions:
Recommended public health actions:

Comment on following levels: community, health facility, district, partners, provincial, and national
District Medical Officer of Health: _____ Date report completed------
Signature----------

ANNEX 8: HANDLING AND TRANSPORT OF NASO- PHARYNGEAL SWABS FOR VIRAL ISOLATION

Nasopharyngeal specimens for virus isolation must be collected as soon as possible after onset and not longer than 5 days after the appearance of the rash, when the virus is present in high concentration.
The national team will immediately facilitate this process.
The patient is asked to open the mouth wide and say "ah". The tongue should be depressed with a spatula, and a nasopharyngeal swab is obtained by firmly rubbing the nasopharyngeal passage and throat with sterile cotton swabs to dislodge epithelial cells. The swab is then placed in a labeled viral transport tube ensuring that the swab is immersed in the sponge containing the viral transport medium. ***(pic.below 4)*** The tube is transported to the laboratory at 2 – 8 ℃, using frozen ice packs and appropriate insulated shipping container.



NB: Ideally, samples for virus isolation should be Collected simultaneously with the blood samples for Serological confirmation of Measles as the cause of the outbreak. Collection of specimens for virus isolation should not be delayed until laboratory confirmation of a suspected case of measles is obtained.

Method of collecting and handling throat swabs for viral culture.

ANNEX 9: FORMULAS FOR THE CALCULATION OF SURVEILLANCE INDICATORS

The formulas for the calculation of the surveillance indicators are shown below. All the formulas are calculated as percentage points except indicator number four, which is a rate calculated as indicated.

vii. Timeliness of serum/ dried blood specimens arriving at lab (Target > 80% arriving at lab <3 days of being taken)

$$\frac{\text{Number of serum / dried blood specimens that arrived at National lab within 3 days of collection}}{\text{total specimens received at National lab}}$$

viii. Timeliness of feedback of serology results from the laboratory: (Target: = / > 80% results received at National level within 7 days of specimen receipt at lab)

$$\frac{\text{Number of results sent out by laboratory to the National level within 7 days of receipt of specimens at lab}}{\text{Total number of specimens received by lab}}$$

ix. Proportion of serum specimens arriving at the National measles laboratory in good condition (Target: at least 90% of specimens arriving at the laboratory in good condition; i.e., adequate volume, no leakage, not turbid, not dessicated)

$$\frac{\text{Number of serum specimens that arrived at National lab in good condition}}{\text{total specimens received at National lab}}$$

x. Proportion of lab confirmed measles cases (Target: < 10% of investigated cases confirmed to be measles by serological investigation)

$$\frac{\text{Number of lab confirmed measles cases}}{\text{Total number of serologically investigated suspected measles cases with lab results available}}$$

xi. Proportion of representative serum specimens sent quarterly by the national laboratories to the regional reference labs for re-confirmation as part of quality assurance measures (Target: at least 10% of specimens received at national lab shared with the RRL)

$$\frac{\text{Number of serum or dried blood specimens sent to the RRL by the national measles lab}}{\text{Total number of serum and dried blood specimens received at National laboratory in the quarter}}$$

xii. Proportion of concordance of measles IgM results between the national measles lab and the regional reference lab (Target; at least 90% concordance between results of shared specimens)

$$\frac{\text{Number of serologic results concordant with the National lab when re-tested at RRL}}{\text{Total number of serum and dried blood specimens shared by the National laboratory with the RRL since the beginning of the year}}$$

ANNEX 10 ; TIMELINESS AND COMPLETENESS MONITORING FORMS

Sample form for recording timeliness and completeness of IDS monthly reporting from the health facility to the district

Legend

T = arrived on time L = arrived late W = report not received

Country _____ Province_____ District _____ Year _____

Name of health Facility	Jan	Feb	Mar	Apr	May	Jun Jul	Aug	Sep	Oct	Nov	Dec
Total number of reports expected (N) Total reports sent on time (T)											
Total reports sent late (L)											
Total number of reports not received (W)											
Timeliness of the reports =100 * T / N											
Completeness of reporting =100 * (N-W) / N											

NB: Please note that timeliness and completeness are expressed as percentages (%). When the surveillance system is good, the rates for timeliness and completeness should approach 100%. This table allows for monitoring the progress of these two indicators in the district so that action can be taken to improve timeliness for each health facility in the district.

GLOSSARY OF TERMS

CASE: A person who has the particular disease, health disorder, or condition that meets the case definition for surveillance and outbreak investigation purposes. The definition of a case for surveillance and outbreak investigation purpose is not necessarily the same as the ordinary clinical definition.

CASE DEFINITION: A set of diagnostic criteria that must be fulfilled for an individual to be regarded as a case of a particular disease for surveillance and outbreak investigation purposes.

CATCH UP CAMPAIGNS: measles supplemental vaccination campaigns involving all children aged 9 months to 14 years irrespective of their prior immunization status.

CLUSTER: Aggregation of relatively uncommon events or diseases in space and/or time in numbers that are believed or perceived to be greater than could be expected by chance.

COMPLETENESS OF REPORTING: the proportion of all expected reports that were actually received (usually stated as % completeness as of a certain date).

EPIDEMIOLOGIC LINKAGE: direct contact with a laboratory-confirmed measles case whose rash onset was within the preceding 30 days before the present case.

FEEDBACK: The regular process of sending analyses and reports about the surveillance data back through all levels of the surveillance system so that all participants can be informed of trends and performance.

FOLLOW UP CAMPAIGNS: periodic measles supplemental vaccination campaigns involving all children born since the last catch-up campaigns irrespective of their prior immunization status; often every 3 - 4 years.

PERFORMANCE INDICATORS: Specific agreed measurements of how the surveillance or reporting system is functioning. These indicators may measure both the process of reporting (e.g., completeness, timeliness) and the action taken in response to surveillance information (e.g., the percentage of cases investigated) and the impact of surveillance and control measures on the disease or syndrome in question (e.g., the percentage of outbreaks detected by the system).

SENSITIVITY: The ability of surveillance or reporting system to detect true health events i.e. the ratio of the total number of health events detected by the system over the total number of true health events as determined by an independent and more complete means of ascertainment.

SPECIFICITY: A measure of how infrequently a system detects false positive health events i.e. the number of individuals identified by the system as not being diseased or not having a risk factor, divided by the total number of all persons who do not have the disease or risk factor of interest.

SURVEILLANCE, ACTIVE: Surveillance where public health officers seek reports from participants in the surveillance system on a regular basis, rather than waiting for the reports (e.g. Regular visits to reporting sites).

SURVEILLANCE, CASE-BASED: Surveillance of a disease by collecting specific data on each case (e.g. collecting details like the age, vaccination status, address, date of onset… on each case of measles).

SPOT MAP: A map that indicates the location of each case of a disease by showing places that are potentially relevant to the health event being investigated.

TIMELINESS OF REPORTING: proportion of all expected reports that were received by a certain due date.

ZERO REPORTING: The reporting of "zero case" when no cases have been detected by the reporting unit. This allows the next level of the reporting system?? to be sure that the district/facility has not sent data that have been lost, or forgotten to report.