Communicable Disease Surveillance Manual

Version 1.0

National Communicable Disease Surveillance Manual of Montserrat

December 2006

FOREWORD

A health system that all in Montserrat can trust.

A health system that is there when people need it regardless of ability to pay.

A health system that reduces inequalities in health.

These are the messages that people have been sending to the Government of Montserrat. The Government has listened. We want to develop a health system that puts people at the heart of health care.

Diseases capable of being passed from one person to another, Communicable Diseases, are in the core of this health system. We are able to meet the challenges facing us. We have the knowledge, and we have know-how. We can accomplish the comprehensive and integrated approach leading to health promotion, disease prevention, care and treatment.

This Communicable Disease Surveillance Manual has been born basically from the ashes of a renewed community, which so dramatically had to be remodelled following the dramatic Soufrière hills volcano.

The Manual is evidence based and builds upon international conventions, best practices and code of conduct, but it is also based upon the Montserrat reality. It is a vibrant Manual, which is a living document pacing with the recovery and development of the Montserrat community; with the options and opportunities.

It is not a stand alone publication. The Communicable Disease Surveillance Manual is resting upon the legislation and health policies of the Government of Montserrat and being part of the Overseas Territory of UK communicable disease surveillance system.

The Manual should be seen as an integral part of the Global and Regional Surveillance Systems such as the CAREC and EUVAC.NET, which is the EU surveillance network for vaccine-preventable infectious diseases, and it is part of the International Vaccinations and Travellers Health.

I would here like acknowledge the eminent efforts of our staff in the preparation of this comprehensive Manual, and in particular, I would like to forward a specific thanks to Ms. Violet Brown, as the coordinator, and the other members of the Surveillance Response Team, who made the publication possible.

Brades, 17 October 2006

Kenneth Wind-Anderson
Chief Medical Officer

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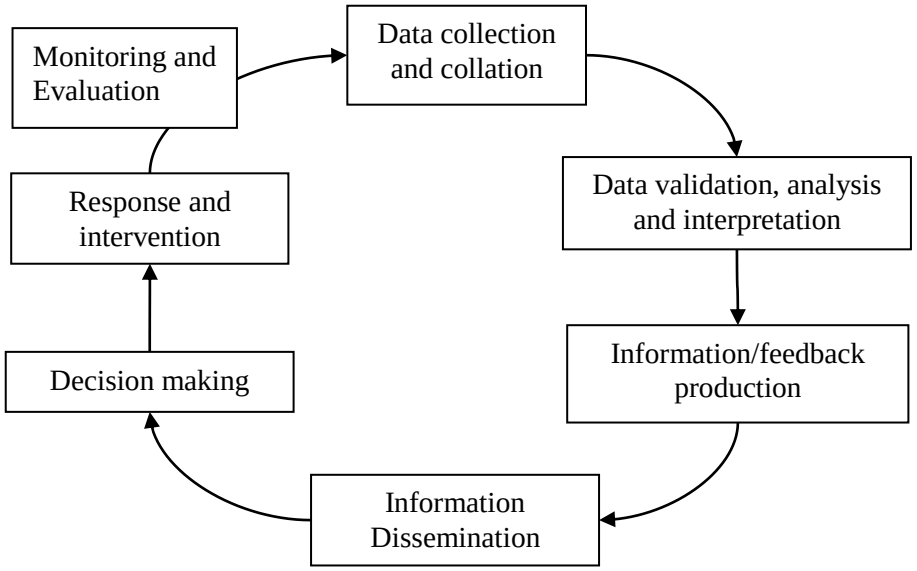
1. Introduction to Surveillance

1.1. Definition

Surveillance is defined by World Health Organisation (WHO) and the US Centres for Disease Prevention and Control (CDC) as the ongoing systematic collection, analysis and interpretation of outcome specific data for use in planning, implementation and evaluation of public health practice. Surveillance systems should gather data from relevant sources then validate and analyse this data to generate useful information to be disseminated and used for public health action (Figure 1-1).

- The purpose of any surveillance system is to provide **information for action**.
- An effective surveillance system is action oriented where the public health professions respond in a **timely** and **appropriate** manner by reviewing the data and responding to what they see.

Figure 1-1: Surveillance cycle



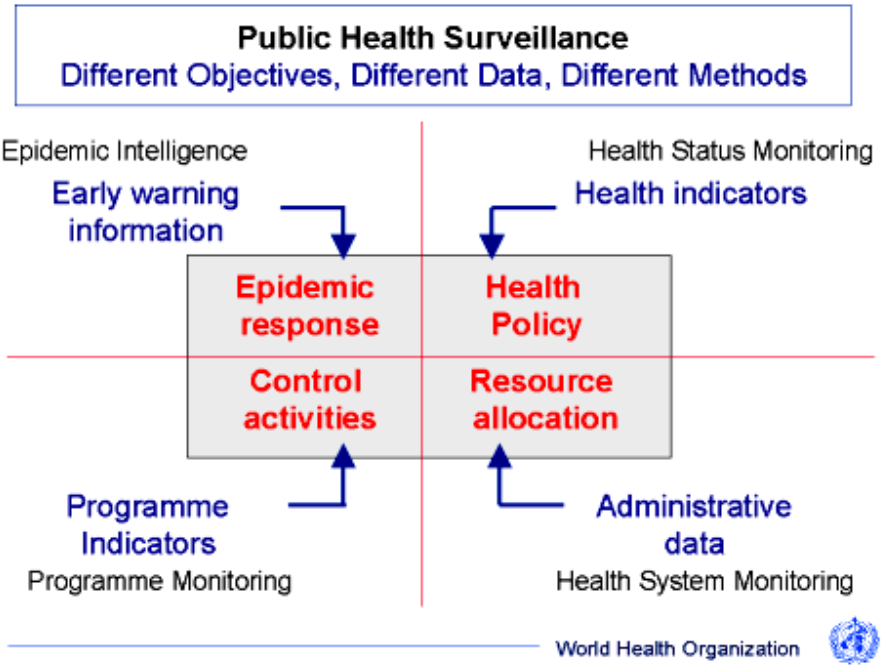
A surveillance system aimed at timely and effective response to unusual disease situations (such as epidemics) relies on timely and accurate data reporting. If a surveillance system is to inform effective control measures, programmes must be monitored using appropriate programme indicators. Surveillance systems inform health policy by monitoring health status using appropriate health indicators. In planning resource allocations the administrative data in the health system ***must*** be monitored.

1.2. Objectives, sources of data and methods

Surveillance facilitates the early detection of changes in communicable disease (CD) trends, unusual events, clusters and outbreaks to initiate appropriate control activities to limit the spread of adverse health conditions, ultimately reducing morbidity, mortality and negative economic impact. It can be used, for example, to identify risk groups and guide the implementation of relevant intervention activities such as educational messages. Surveillance can also be used to evaluate the effectiveness of our national programmes and provide a basis for shaping public health policy.

As shown in the WHO framework, surveillance systems need to collect different types of data, different types of information and use different methods to achieve different objectives (Figure 1-2).

Figure 1-2: Outline of Public Health Surveillance



1. Epidemic response objective: **Epidemic Intelligence** information is needed for monitoring trends (to generate baseline rates) and to provide early warning information to detect unusual events, clusters, outbreaks and epidemics and to initiate a timely and relevant response. For example, an increase in the number of cases of rash and fever should trigger an investigation to determine aetiology and relevant response for control.
2. Control activities objective: Programme indicators are needed for monitoring of their effectiveness, for example, EPI coverage rates are important to monitor the performance of an immunisation programme.
3. Health policy objective: Monitoring of health indicators is necessary for developing health policy. For example, due to the increasing prevalence of HIV/AIDS in Montserrat, one of the responses of the government is to upscale the Maternal and Child Health Programme and the National AIDS Programme to include the prevention

of mother to child transmission (PMTCT) and the provision of care and treatment to people living with HIV/AIDS.

4. Resource allocation objective: Epidemiological and administrative data are needed for appropriate resource allocation. For example, in response to dengue fever, gastroenteritis and/or food borne illness outbreaks which may impact negatively on the tourism industry, there is a greater need for allocating relevant financial and human resources in prevention measures and timely outbreak investigation and control.

In order to generate a complete and accurate picture of a given health situation the surveillance process requires data from several sources such as:

- Vital statistics
- Hospital Reports
- Morbidity and mortality reports
- Case reports and investigations
- Disease Registries
- Outbreak reports and investigations
- Laboratory reports
- Sentinel reports (**Public and Private** sources)
- Agricultural (animal and plant health) reports
- Environment and environmental health reports
- Surveys, censuses

(For further information on data sources refer to "Public Health Surveillance; A Caribbean Communicable Disease Surveillance Manual for Action", CAREC, 1999, pages 23-24)

1.3. Types of surveillance

Surveillance facilitates the early detection of outbreaks to initiate appropriate control activities to limit the spread of the outbreak, ultimately reducing morbidity, mortality and economic impact. It can be used to identify risk groups needing prophylaxis, treatment or education. Surveillance can be used to evaluate the effectiveness of national programmes and provide a basis for shaping Public Health Policy.

Surveillance systems can be passive, active or a combination of both. A passive surveillance system is one in which it is the responsibility of the health care provider to send surveillance data at predetermined intervals (e.g., routine weekly reports) to the Surveillance Unite. An active surveillance system is one in which the Surveillance Unit solicits (by calls or visits) data from health care providers at prescribed intervals. The latter system requires greater human and financial resources than the former.

Key Messages:

- Passive surveillance is good for monitoring trends over time, place and person, especially for diseases of moderate to high prevalence. Active surveillance requires more resources and commitment if it is to remain active.
- Active surveillance is most often used for diseases of special interest, for example, with high case fatality rate, subject to elimination and/or eradication, and with emerging or re-emerging potential such as measles, polio, malaria, yellow fever, dengue hemorrhagic fever, SARS and TB.
- Implementing active surveillance requires more resources than passive surveillance.

Surveillance systems can also use syndromic or etiologic information, or a combination of both. Syndromic surveillance is particularly useful as an early alert system. Etiologic surveillance is more useful for monitoring specific disease trends.

Syndromic surveillance is based on the reporting of different categories of clinical presentations (signs and symptoms). Etiologic surveillance is based on the identification and characterization of disease-specific agent(s) by the laboratory.

Syndromic surveillance better suits frequent reporting mechanisms allowing for a timely response. Etiologic (Disease) surveillance is important for evaluating disease prevention and control programmes and planning mid to long-term interventions.

Key Messages:

- Syndromic surveillance is good for early detection of public health threats, including bio-terrorism threats. It should be followed by disease specific information as soon as it becomes available.
- Laboratory-based surveillance is necessary for guiding appropriate response and for monitoring specific disease trends. It should compliment the syndromic surveillance system.
- Since clinical diagnosis is the basis of syndromic surveillance and laboratory diagnosis is the basis of etiologic surveillance, they should not be considered mutually exclusive but rather complementary.

The surveillance system can also be structured in terms of sources of information being exhaustive or based on sentinel sites. Ideally, a good surveillance system should combine each one of the above characteristics.

1.4. Attributes of Surveillance Systems

When planning or evaluating a surveillance system, the following attributes can be used to gauge the overall usefulness of the system (definitions appear in the glossary):

- Simplicity
- Flexibility
- Acceptability
- Representativeness
- Timeliness
- Sensitivity
- Positive Predictive Value (PPV)

2. The Communicable Disease surveillance system in Montserrat

The goal of the Communicable Disease Surveillance in Montserrat is to control and prevent the introduction and spread of communicable diseases.

2.1 Mission statement

To maintain, protect and improve the health and well being of residents and visitors of Montserrat by the efficient assessment of health threats through timely and accurate reporting leading to effective evidence-based decision-making and appropriate resource allocation for action.

2.2 Description of the national CD surveillance system

2.2.1 Purpose

The purpose of the Communicable Disease Surveillance System is to:

(a) provide information to enhance the decision-making process and
(b) allow health workers to be prepared and to respond in a timely manner to public health threats.

2.2.2 Objectives

The objectives of Montserrat's communicable disease surveillance system are:

- To allow for the early detection of and appropriate response to unusual events, clusters and outbreaks of communicable diseases
- To provide epidemiological data on the magnitude, distribution and trends of communicable diseases, according to time, place and person
- To provide relevant information to contribute to programme planning, monitoring and evaluation, including the impact of interventions
- Assess the quality of Health Care
- Detect changes in Health Practice
- To identify research needs and
- To strengthen the National Communicable Disease Surveillance Systems.

2.2.3 Legal framework

The Communicable Disease surveillance system in Montserrat operates within the legal framework of Chapter 14.01, Section 20 of the Public Health Act, of the Revised Laws of Montserrat.

This includes the surveillance of:
(a) communicable diseases under International Health Regulations, and
(b) communicable diseases and syndromes as stipulated by the Chief Medical Officer.

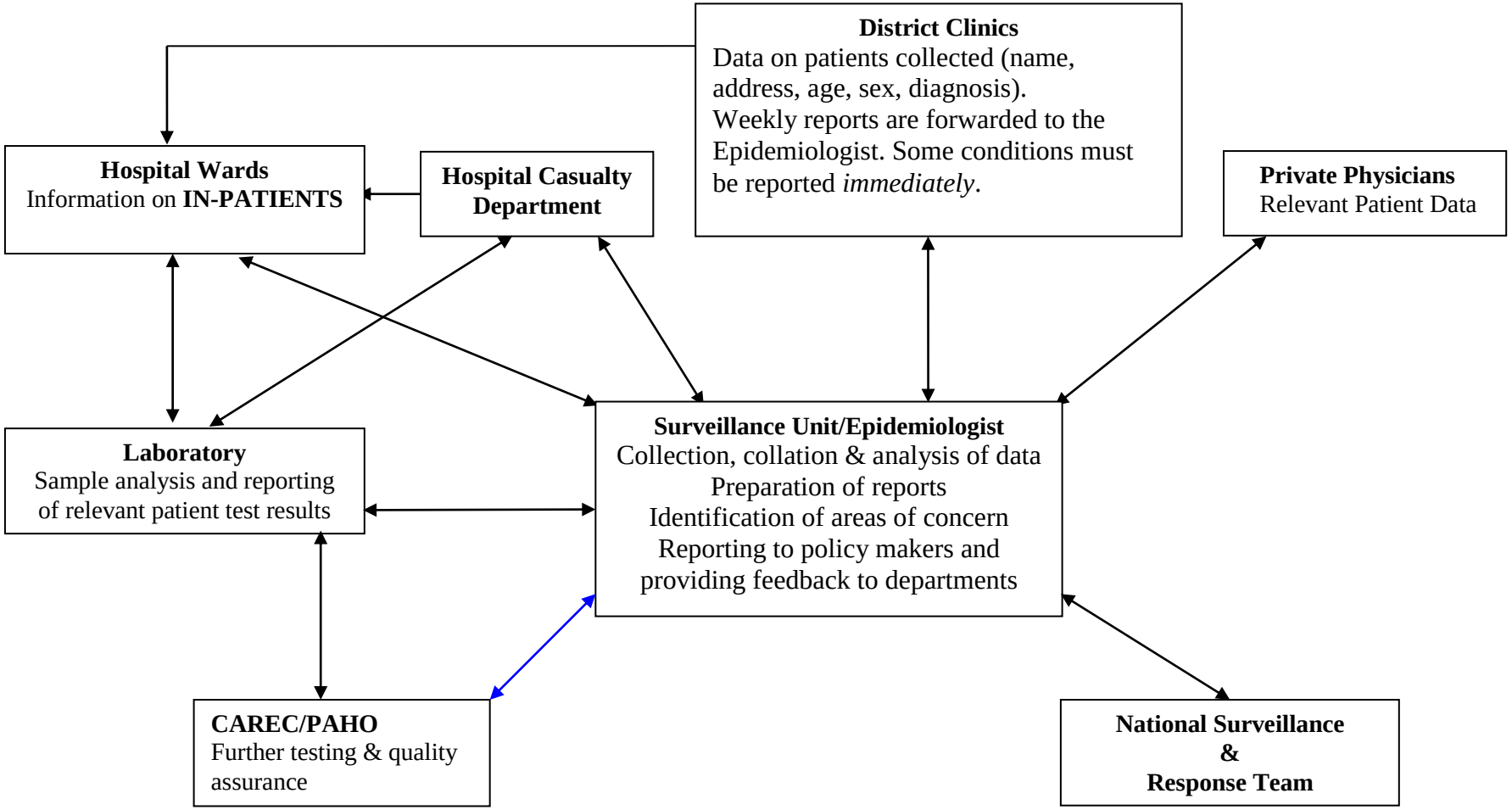
Current International Health Regulations (IHR) state that three diseases, plague, cholera and yellow fever must be reported to WHO through CAREC and PAHO/CPC. These regulations have been revised and are due for implementation in June 2007. Under this revised IHR, a case of Smallpox, Poliomyelitis due to wild-type poliovirus, human influenza caused by a new subtype and Severe Acute Respiratory Syndrome (SARS) – shall be notified.

In addition, an event involving cholera, pneumonic plague, yellow fever, viral haemorrhagic fever (Ebola, Lassa, Marburg), West Nile fever, other diseases of special national or regional interest (dengue fever, meningococcal fever) – shall always lead to utilisation of the algorithm to decided about notification to WHO. Also, any event of potential international public health concern (including unknown causes or sources and those involving other events or diseases than those listed above) – shall lead to utilisation of the algorithm to decide about notification to WHO.

2.2.4 Reporting chain and data collection:

The Flow of information within Montserrat's Communicable Disease Surveillance System is depicted below in figure 2-1

Figure 2-1: Reporting chain and data collection



Reporting Chain

Level 1

Facilities where clients are most likely to initiate first contact, these include all four (4) Community Clinics, Casualty and Private Physician (s).

Functions

- Collation of pertinent surveillance data on clients
- Perform some basic surveillance activities
- Instituting patient care management
- Making appropriate referrals.

Level 2

Health personnel at this level may seldom come into direct contact with the client, except in the laboratory. However by virtue of their training and surveillance expertise, they will liaise with level 1 to get appropriate client data for processing. These personnel include the Manager of the Expanded Programme on Immunisation and Coordinators of the Tuberculosis, Leprosy and HIV/AIDS/STI programmes.

Functions

- Collate aggregate client information
- Verify the information collected
- Assist with surveillance activities of cases/case detected at level 1
- Maintain regular contact with Health Personnel at level 3
- Transfer collated information to level 3 in a timely manner.

Epidemiology Unit (presently only Epidemiologist on - additional staff to be added**)**

The Epidemiology Unit's functions include but are not limited to the following:

- Collation of notification data from levels 1 & 2
- Review of notification data.
- Assist with investigation of exceptional cases
- Perform surveillance activities for selected diseases
- Perform basic data analysis

Epidemiologist

The Epidemiologist has overall responsibility for communicable disease surveillance on Montserrat. Responsibilities include but are not limited to the following:

- Validation of all data from levels 1 & 2
- Analysis of all data
- Transforming data into information
- Developing preventative actions and strategies
- Dissemination of data and/or information
- Interaction with level 3 to facilitate policy formulation

Level 3

Health personnel at this level are involved with policy formulation and dissemination. They include the Honourable Minister of Health, Permanent Secretary in the Ministry of Health & Community Services and the Chief Medical Officer.

2.2.5 Privacy protection

All aspects related to CD reporting are subject to the highest level of confidentiality (details will be outlined in the Ministry's confidentiality policy).

2.2.6 Data (and information) reporting

The following table contains details pertaining to information dissemination.

Table 2-2: National level syndromic data and information reporting timeline

Monday a.m.	→	Data from reporting sites on syndromes for the previous epidemiological week are sent from the relevant reporting sites to the Epidemiology Unit. *[by fax or phone]* EPI surveillance data (rash and fever, acute flaccid paralysis) are reported to the Unit/EPI manager to be forwarded to CAREC. *[transferred by fax or phone]*.
Tuesday	→	Data are compiled for Weekly CD Report, outstanding reports to be followed up by calling relevant sites. Review of aggregate data by Surveillance Unit/Team for any new trends or unusual cases for follow up.
Wednesday	→	Data and information on CD cases, syndromes and deaths are reported to CAREC. *[by fax, telephone or email]* National EPI syndromic surveillance data are reported to the regional level (CAREC). *[by fax or telephone]*
Thursday		Follow up activities as needed.
Friday (p.m.)	→	Follow up activities as needed.
Specific Diseases		Individual **case reports** on specific (severe and deaths) syndromes of CD – see Table 3.1 - are actively and/or passively reported from the relevant sentinel sites to the Surveillance Unit. *[by fax or phone]* For **specific suspect or unusual individual cases** and **clusters of suspected cases** seen at any reporting site, reports sent immediately to Epidemiologist *[by phone]*.
Quarterly	→	Epidemiologist reports to the National Surveillance and Response Team on the CD monthly trends and specific related events. *[Meeting and/or briefing notes]* Epidemiology Bulletin prepared for distribution to all stakeholders.

Notes: 1. AIDS/HIV and STI data/information is reported to CAREC on a quarterly basis.
2. The Environmental Health Department collects and compiles data pertinent to vector control from the health regions on a monthly basis.
3. Laboratory shall report to National Epidemiologist on individual cases of diseases as listed in Table 3.1. *[by fax or phone]*

Table 2-3: Regional level syndromic and disease data and information reporting times

Thursday	→	Analysis, interpretation and editing of the regional weekly report (CAREC Surveillance and Response Team)
Friday	→	Dissemination of the E-CSR on CariSurvNet (CAREC Epidemiology Division)
Monthly	→	Collection, compilation, analysis, interpretation and dissemination of the monthly regional report (CAREC Surveillance and Response Team)

2.2.7 Analysis and Interpretation & output generating

Weekly time and place analysis and interpretation of syndromic CD surveillance data by the Epidemiology Unit is done systematically on Mondays/Tuesdays. As per the above Table 2-2, output generating and weekly reporting to CAREC on Wednesdays. Analysis of CD monthly trends and unusual events happens at the end of each month for reporting to the National Surveillance and Response Team (S&R Team) as necessary. A quarterly Surveillance Bulletin will be prepared by the Epidemiology Unit for distribution to stakeholders.

2.2.8 Information dissemination

In Montserrat, in-country dissemination of relevant CD information to data providers (feedback) and decision makers is achieved in different ways and with different periodicity. The main mechanisms for systematic information dissemination on communicable diseases, at regional and national levels, are summarised in Table 2-2 above. In addition the following channels and media also exist:

- ➔ An Annual Epidemiology Report is produced by the Epidemiologist at the beginning of the year and distributed to the Heads of Departments within the Ministry of Health. The report outlines the schedule of dates relevant to surveillance, important meetings and other issues relevant to the control of communicable diseases in Montserrat. Department heads are responsible for the dissemination of the Newsletter to their own staff.
- ➔ Whenever the health/epidemiological situation warrants (e.g., in the case of an outbreak), the Epidemiology Unit immediately communicates with relevant stakeholders and decision-makers on the matter and actions to be taken. Such situations and related interventions are also systematically reviewed and updated during the meetings of the National Surveillance and Response Team.
- ➔ A Quarterly Bulletin will be produced by the Epidemiology Unit to highlight surveillance activities and identify positive or negative trends. Relevant information will be shared with all staff who will be encouraged to discuss the data and provide feedback to the Unit.
- ➔ Information on tuberculosis, leprosy, HIV and other STIs will also be disseminated during Contact tracing Meetings, in the annual Epidemiology Report and other relevant times. The contact tracing meeting includes members of the NSR Team, all Environmental Health Officers and the STI/HIV/AIDS focal person.
- ➔ Ultimately, the Chief Medical Officer with the technical support of the Epidemiology and the Health Promotion Units is responsible for the dissemination CD information to the public at large and/or to specific audiences (e.g., professional

groups, schools) using different mass media (e.g., television networks, newspapers).

Table 2-4: Summary of the dissemination of National reports

REPORT	RECIPIENT	METHOD OF DISSEMINATION
Weekly syndromic surveillance report	CAREC	Fax or Telephone
Weekly EPI reports (Fever & Rash, AFP)	CAREC	Fax or Telephone
Quarterly Epidemiology Bulletin	In-country stakeholders	Mail
Quarterly HIV/AIDS/STI reports	CAREC	Fax
Annual HIV/AIDS/STI reports	In-country stakeholders and CAREC	Fax or Email
Annual TB report	In-country stakeholders and CAREC	Fax or Email
Outbreak reports (as required)	CAREC	Fax or Email

2.2.9 Use of data and information

Ideally, CD data and information should, in first instance, be used as close as possible to where problems are happening and can be solved, i.e., Reporting Sites. However, close interaction and collaboration between all levels of the system, local and regional organisations is essential for efficient surveillance of, and response to, communicable diseases. Ultimately, all levels of the health care system should also use CD information according to the objectives of the system (see section 2.2.2. above).

➔ Data are used at Level 1 for prevention and control activities, e.g.:
- Identifying changes in syndromes and/or diseases trends and unusual events
- Identifying high risk groups
- Patients and public education
- Treatment
- Prophylaxis
- Increased surveillance activities, especially active case finding and contact tracing.

Information derived from the data may also be used for:
- Identifying training needs and conducting training sessions
- The management and planning of human resources, drugs, equipment and infrastructure (e.g.: specific nursing staff, vaccines and cold chain, ORS, water supply, sanitation facilities).

➔ Data are used at Levels 2 & 3 for early detection of outbreaks and unusual events, estimating the magnitude of CD in Montserrat, monitoring trends and programmes and to direct action for prevention and control.

Information derived from the data may also be useful at these levels for:
- Estimating and projecting future needs
- Assessing programme needs

- Allocating resources
- Health mapping (spatial and temporal analysis)
- Advocacy
- Identifying and setting priorities
- Developing policies and guidelines
- Identifying training needs and as a training tool
- Health Research purposes

2.2.10 Evaluation

The National Surveillance System is to be reviewed internally every two years and externally evaluated every 4-5 years. Guidelines for evaluating a surveillance system published by WHO, CDC and CAREC can be used.

The internal reviews will consist of:

- The assessment of selected characteristics of the national CD surveillance system, (i.e., timeliness, flexibility, completeness, acceptability)
- The Examination of the main areas in need of strengthening among the various functions (e.g., data collection, reporting, analysis, interpretation, dissemination, laboratory diagnosis and logistics)
- An update of the National CD Surveillance Manual, if necessary.

A team consisting of members of the National Surveillance & Response Team will carry out the internal reviews — additional persons may be invited to join the review team, which will be co-ordinated by the Epidemiologist.

External evaluations should cover process, content and impact. This external evaluation will be carried out by CAREC and CPC/PAHO/WHO and the national counterparts as identified by the Ministry of Health.

Provision will be made for evaluation to be:

- Planned well in advance (especially regarding the selection of the external team members and the necessary financial resources)
- Be conducted on a participatory mode at national and local levels
- Aim at a capacity-building exercise at all levels

The list of Sentinel sites is as follows:

- Glendon Hospital (n=1)
- Casualty Department (n=1)
- Health Centres (n=4)
- Laboratory (n=1)
- Private Doctors (n=1-3)

Total number of reporting sites is 8 (Sometimes ranging from 8-10 depending on the number of private Doctors on island at the time).

3. Notifiable Diseases & Syndromes

3.1National requirements

Syndromes and diseases under national surveillance are listed in the table below.

Table 3-1: Diseases and Syndromes under Surveillance in MONTSERRAT

CONDITION	CATEGORY	
Acute Flaccid Paralysis	Syndromic	Immediate Reporting
Acute Respiratory Illness < 5 years		Weekly
Conjunctivitis (non-neonatal)		Weekly
Fever and Hemorrhagic Symptoms		Immediate Reporting
Fever and Neurological Symptoms		Immediate Reporting
Fever and Rash		Immediate Reporting
Fever and Respiratory Symptoms ≥ 5 yea		Weekly
Gastroenteritis ≥5 years		Weekly
Gastroenteritis < 5 years		Weekly
Undifferentiated Fever ≥5 years		Weekly
Undifferentiated fever <5 years		Weekly
Cholera	Diseases subject to the International Health Regulations	Immediate Reporting
Plague		Immediate Reporting
Yellow Fever (Urban or Sylvatic)		Immediate Reporting
Influenza	Diseases Under International Surveillance	Immediately
Malaria		Immediately
SARS CoV		Immediately
Tuberculosis (Pulmonary)		Immediately
Tuberculosis (Extra pulmonary)		Immediately
Dengue Fever	Other Diseases of Regional Interest	Immediately
Dengue Haemorrhagic Fever/Shock Syndrome		Immediately
Leprosy (Hansen's Disease)		Immediately
Meningococcal Infection (due to Neisseria meningitidis)		Immediately
West Nile virus		Immediately
Ciguatera Poisoning	Other Diseases of Caribbean Interest	Weekly
Leptospirosis		Immediately
Rabies (in humans)		Immediately
Scabies		Weekly
Typhoid and Paratyphoid Fevers		Immediately
Viral Encephalitis / Meningitis		Immediately
E. coli (EHEC; O157)	Diseases Under Laboratory Surveillance	Immediately
Campylobacter		Immediately
Salmonellosis		Immediately
Shigellosis		Immediately
Viral Hepatitis A		Immediately
Viral Hepatitis B		Immediately

Table 3-1 (cont.)

AIDS	Sexually Transmitted Infections	Weekly
HIV		Weekly
Urethral Discharge		Weekly
Gonorrhoea		
Chlamydia		
Non specific urethritis		
Genital Ulcer		Weekly
Syphilis		
LGV		
HSV		
Chancroid		
Vaginal Discharge		Weekly
Gonorrhoea		
Chlamydia		
Trichomonas		
Bacterial Vaginosis		
Unspecified		
Bacterial Meningitis	Vaccine preventable diseases	Immediately
Bacterial Pneumonias		Weekly
Chicken Pox		Immediately
Diphtheria		Immediately
Haemophilus Influenza Pneumonia		Immediately
Haemophilus Influenza Meningitis		Immediately
Measles		Immediately
Mumps		Weekly
Neisseria Meningitidis Meningitis		Immediately
Non-Specific Meningitis		Immediately
Poliomyelitis		Immediately
Strep. Pneumoniae Pneumonia		Immediately
Tuberculose Meningitis		Immediately
Neonatal Tetanus		Immediately
Tetanus		Immediately
Viral Meningitis		Immediately
Whooping Cough		Immediately

3.1 Regional requirements

Table 3-2 lists the syndromes and diseases that are reportable on a regional basis. It is the responsibility of the Epidemiologist to submit reports in accordance with the specified frequency.

Table 3-2: Syndromes and Diseases under Surveillance at the Regional Level

WEEKLY REPORTING – REGIONAL	
Diseases subject to the International Health regulations*	Cholera Plague Yellow Fever (Urban or Sylvatic)
Syndromes	Acute Flaccid Paralysis Acute Respiratory Illness < 5 years Fever and Hemorrhagic Symptoms Fever and Neurological Symptoms Fever and Rash Fever and Respiratory Symptoms ≥5 years Gastroenteritis ≥5 years Gastroenteritis < 5 years Undifferentiated Fever ≥5 years Undifferentiated fever <5 years

*Diseases subject to International Health Regulations must also be reported IMMEDIATELY to CAREC via phone, fax or email.

MONTHLY REPORTING – REGIONAL	
Diseases under International Surveillance	Influenza Malaria SARS CoV Tuberculosis (Pulmonary) Tuberculosis (Extra-pulmonary)
Other Diseases of Regional Interest	Dengue Fever Dengue Haemorrhagic Fever/Shock Syndrome Leprosy (Hansen's Disease) Meningococcal Infection (due to Neisseria meningitidis) West Nile Virus
Other Diseases of Caribbean Interest	*Campylobacter* Ciguatera Poisoning *E. coli* (ETEC) Leptospirosis Rabies *Salmonella* *Shigella* Typhoid and Paratyphoid Fevers Viral Encephalitis/Meningitis Viral Hepatitis A Viral Hepatitis B

QUARTERLY REPORTING – REGIONAL	
Sexually Transmitted Infections (Using the CAREC Quarterly Reporting form)	AIDS Bacterial Vaginosis Chancroid Chlamydia Genital Ulcer Gonorrhoea Herpes Simplex Virus (HSV) HIV Lyphogranuloma Venereum (LGV) Non-Specific Urethritis (NSU) Syphilis Trichomonas Unspecified Urethral Discharge Vaginal Discharge
Diseases of interest to the Expanded Programme on Immunisation (cont.)	Bacterial Meningitis, other Bacterial Pneumonia Chicken Pox CRS Diphtheria *Haemophilus influenzae* Meningitis *Haemophilus influenza* Pneumonia Hepatitis B Measles Mumps *Neisseria meningitides* Meningitis Neonatal Tetanus Non specific Meningitis *Step.pneumoniae* Pneumonia Tetanus Tuberculose Meningitis Viral Meningitis Whooping Cough

3.2 Case definitions for syndromes

- **Fever and Respiratory Symptoms:** Acute febrile illness (> 38C or 100.4F) in a previously healthy person, presenting with cough or sore throat with or without respiratory distress

- **Undifferentiated fever > 5 years:** An acute febrile illness (> 38C or 100.4F) in a previously healthy person of less than 7 days duration with **two or more** of the following manifestations: headache, retro-orbital pain, myalgia, arthralgia – AND without any particular symptoms fitting another case definition.

- **Undifferentiated fever < 5 years:** Case definition is the same as above**. HOWEVER,** case management and specimen collection will vary according to the evolution of the clinical presentation.

- **Fever and Hemorrhagic symptoms:** Acute onset of fever (> 38C or 100.4F) in a previously healthy person, presenting with at least one of the following manifestations: hemorrhagic or purpura, epistaxis, haemoptysis, melena with or without jaundice.

- **Fever and Neurological symptoms:** Acute onset of fever (> 38C or 100.4F) in a previously healthy person presenting with at least two of the followings signs: headache, meningeal irritation, convulsions, vomiting, altered consciousness, altered sensory manifestations, paralysis.

- **Gastroenteritis:** Acute onset of diarrhoea, with or without fever (> 38C or 100.4F) and presenting with 3 or more loose or watery stools in the past 24 hours, with or without dehydration, vomiting and/or visible blood.

- **Fever and Rash:** Onset of fever and systemic symptoms; generalized eruption (macular, papular, vesicular) or eruption localized to part of the skin and/or mucous membranes

- **Acute Flaccid Paralysis:** One or more limbs with decreased or absent tendon reflexes without other apparent cause and without sensory or cognitive loss

3.3 Case Definitions for Diseases under Surveillance

For disease case definitions in Montserrat, refer to the following manual: "Public Health Surveillance; A Caribbean Communicable Disease Surveillance Manual for Action", CAREC, 1999

3.4 Relationship of syndromes to diseases

Table 3-3: Syndromes and diseases

Syndromes	Potential Pathogen/Disease
Undifferentiated fever	1. Dengue 2. Enterovirus 3. Influenza 4. Leptospirosis 5. Malaria 6. Measles 7. Mumps
Fever and Respiratory symptoms	1. Hantavirus 2. Influenza. 3. Legionellosis 4. Leptospirosis 5. Metapneumovirus 6. Respiratory syncytial. 7. SARS CoV
Fever and hemorrhagic symptoms	1. Arenavirus 2. Bacterial (meningococcal, pneumococcal and Hib) 3. Dengue hemorrhagic fever 4. Hantavirus 5. Leptospirosis 6. Malaria *falciparum* 7. Yellow fever
Fever and neurological symptoms	1. Bacterial (meningococcal, pneumococcal and Hib) 2. Enteroviruses (Polio and other enteroviruses) 3. Herpes simplex. 4. Malaria 5. St Louis encephalitis virus 6. West Nile virus
Rash and Fever	1. Dengue 2. Measles 3. Rubella
Acute Flaccid Paralysis	1. Guillain Barre 2. Polio
Gastroenteritis	1. *Campylobacter* 2. *E. coli* 0157:H7 3. Enterotoxigenic *E. coli* 4. Norwalk 5. Rotavirus 6. *Salmonella* 7. *Shigella*

Note: Syndromes represent entry points into the CD surveillance system whereas etiologies and/or diseases are the ultimate outcomes. None of the lists are meant to be exhaustive.

3.6 Forms for surveillance

3.6.1 Surveillance forms

Forms presently in use in Montserrat:

- *Syndromic daily tally sheet**
- *Communicable Disease Case Notification Form*
- *Laboratory request form*
- *Outbreak daily tally sheet*
- *Case investigation Form*
- *CAREC laboratory Investigation Form**
- *Case investigation Forms for individual diseases (CAREC CD Surveillance Manual)*

*Replaced/introduced since the implementation of the revised CD surveillance system.

3.6.2 Outbreak and case investigation forms

Case and outbreak investigation forms can be found in the following manuals and website:

"Public Health Surveillance; A Caribbean Communicable Disease Surveillance Manual for Action", CAREC, 1999

CAREC Website: www.carec.org

4. Laboratory

4.1. List of tests that are conducted at the lone laboratory on Montserrat

4-1: Tests currently conducted at Glendon Hospital Laboratory

TEST	TURN AROUND TIME*
Serology	
• HIV Elisa	24 hours
• HepB sAg	24 hours
• RPR	24 hours
Bacteriology **Not being done in Montserrat****	
Parasitology and fungal testing	
• Helminths	24 hours
• Protozoa	24 hours
• Candida	48 hours

**Time from when specimen is received at Glendon Hospital Laboratory until test results are reported.*
*** situation being addressed*

Tests referred to CAREC or Hammersmith Hospital Laboratories of relevance to Communicable Disease Surveillance

HIV Western Blot	*2 – 3 weeks*
Tuberculosis Smear	*48 – 72 hours*
CD4 Viral loads	*2 - 3 weeks*
Hepatitis B Antibody	*1 week*
Leptospirosis Antibody	*2-3 weeks*
Dengue	*2 weeks*
HPV	*2 weeks*

4.2. Specimen collection and transport

Information on sample collection and transport can be found in the following document:

."Public Health Surveillance; A Caribbean Communicable Disease Surveillance Manual for Action", CAREC, 1999, pages 299 – 301.

4.3. Laboratory request forms

Glendon Laboratory requisitions forms are available at the Medical Records Department and CAREC lab request forms may be obtained from the Glendon Laboratory or the Epidemiology Unit, Ministry of Health.

5. The National Surveillance and Response Team

The National Surveillance and Response Team (S & R Team) meets/networks every quarter (more frequently if necessary) to review data and exchange information on communicable diseases in Montserrat. This body can also take further decisions regarding public health interventions to be carried out as needed.

The primary roles and responsibilities of the S&R Team are:

- Routine analysis and interpretation of CD surveillance data
- Dissemination of CD appropriate information in various professional groups and other audiences
- Initiate, manage and evaluate preparedness and response activities to public health threats
- Collaborate with persons and/or agencies with specific expertise relevant to a given issue at stake
- Follow up the course of outbreaks/epidemics and decide when to revert to routine surveillance and public health activities.

The following are members of the National S & R Team::

- National Epidemiologist (Chair)
- Chief Medical Officer (ex-officio member)
- Health Promotion Officer
- Principal Environmental Health Officer
- Glendon Hospital Senior Medical Technologist
- Public Health Nurse
- EPI Manager/Community Nursing Manager
- District Medical Officer
- Physician Specialist
- Principal Nursing Officer

Other persons may be co-opted when required; these include decision-makers and individuals from other ministries and organisations.

6. Outbreak and Case Investigations

The surveillance and response to communicable diseases, outbreaks and emerging infectious diseases implies 2 different types of investigation.

A) Outbreak investigations could be triggered by:
   (i) Monitoring of trends (epidemic curves)of reported syndromes by sentinel sites
   (ii) Alerts from health professionals and/or laboratory
   (iii) Media reports
   (iv) Notification/complaints from public
   (v) Rumours

B) Case investigations could be triggered by case notifications from:
   (i) Health professionals, including laboratory
   (ii) Police officials or legal system
   (iii) Public
   (iv) Rumours
   (v) Media
   (vi) Notification of cases from sentinel sites, Hospital wards and Laboratory.

6.1 What is an Epidemic and Outbreak?

An epidemic, defined by Last, is “the occurrence in a community or region of cases of an illness, specific health-related behaviour, or other health-related events clearly in excess of normal expectancy” .

An outbreak is an epidemic where there is an increase in the incidence of disease or event in a specific area.

An outbreak is a public health emergency and must be investigated quickly and efficiently. The existence of an outbreak could have serious implications, not just for the persons affected, but also for the wider community.

6.2 The goal of an outbreak investigation

The goal of an outbreak investigation is to break the chain of transmission and prevent the further spread of infection. This is achieved by:

I. Case management – this activity aims to minimise the effects of the disease causing the outbreak, in other words minimise the occurrence of severe morbidity and mortality.

II. Containment of infection- which aims to break the chain of transmission and prevent the further spread of infection from those who are affected to those who are not.

III. Active search for new cases – this is to monitor the development of the outbreak and assess the effectiveness of control measures being implemented. Some ways in which this could be achieved would be through the dissemination of case definitions to all health workers, by visiting hospitals and/or clinics to examine medical records and contact tracing.

IV. Protection of susceptible individuals – this is the identification of risk factors and populations in danger of contracting the disease and then using methods to protect these groups from becoming infected.

6.3 Objectives of an outbreak investigation

An outbreak investigation will involve a multidisciplinary team composed of members from the national surveillance and response team along with members of the local health team.

The objectives of any outbreak investigation are as follows:

1. To control the spread of the outbreak (and identify the etiologic agent, when applicable)
2. To guide the implementation of further control and prevention measures
3. To evaluate and strengthen the surveillance system, if necessary
4. To better understand the disease involved (relationships between infectious agent, host and environment)
5. To train public health personnel in epidemiology

6.4 Ten steps of an outbreak investigation

There are ten key steps that must be performed in a successful outbreak investigation. These steps are guidelines of how the investigation should be approached, but they do not necessarily need to be conducted sequentially. In fact often more than one step may be performed at the same time. These ten steps are:

1. Confirm that an outbreak exists – this can be done by comparing current disease data with earlier data on the disease in question. If no past data are available, you may need to rely on the knowledge and experience of local health staff.
2. Verify the diagnosis – this may be done by reviewing the clinical findings and/or the lab results.
3. Make a quick assessment of the patients – this step will require the formulation of a case definition which will outline the criteria for inclusion as a suspect, probable or confirmed case. (Use epidemiological data and laboratory/ clinical information to formulate case definition).
4. Relate the cases in some way – you will need to relate the cases in terms of;
   4.1. Person – Are they male or female? How old are they?
   4.2. Place – Where did the exposure occur? Is there a common travel history among the cases?
   4.3. Time – What is the time of onset of illness for the cases?
5. Formulate a hypothesis – this hypothesis should be as precise as possible and be used to guide the investigation. It should incorporate all clinical, laboratory and epidemiological facts of the investigation, as well as known factors about the disease process.
6. Plan and conduct a detailed epidemiological investigation – standardized investigation forms should be used for data collection. A case control or cohort study may be conducted to assist in identifying risk factors associated with the outbreak.
7. Analyse the data – this should be done as soon as possible after data are collected. This may involve constructing epidemic curves, calculating rates, developing tables and charts and apply statistical tests to the data (see glossary for detailed explanation on specific analyses)
8. Formulate a conclusion – conclusions should be based on all relevant evidence.
9. Put control measures in operation – these measures should be practical, be put into place immediately and plans should be made to evaluate their effectiveness.
10. Write a report – this report should be clear, precise and usable. It should also include both short and long term recommendations and should be disseminated to appropriate decision-makers.

Outbreak investigation forms are attached as an Appendix.

Alternatively, forms may be obtained from the Epidemiology Unit.

6.5 Management of an outbreak

When planning the activities to be conducted during the investigation, you must find a balance between what is ideal and what is achievable, between what is needed and what you can provide and afford.

Management issues in the investigation of an outbreak include:

- Declare to relevant persons (e.g. immediate supervisor, Chief Medical Officer, Permanent Secretary, regional stakeholders) that an outbreak exists.
- Inform health providers that an outbreak is occurring and advise them how to proceed.
- At each stage of the investigation, consider who else needs to be informed and provide regular updates to necessary persons or countries.
- Inform or respond to the community if necessary.
- Inform or respond through authorised persons* to the media if necessary.
- Consider the capability and capacity of the laboratories you will utilize for support in your investigation and inform the laboratory in advance of the sending of samples.
- Consider the availability of medical supplies that might be needed for your investigation, e.g. Vaccines, antibiotics or oral rehydration solution.
- If necessary, seek assistance early. You may receive assistance from various levels, internal sources, external sources, the Caribbean Epidemiology Centre (CAREC/PAHO/WHO) and other international organizations.
- Declare the outbreak over when appropriate.
- Establish or maintain surveillance activities to monitor the disease or syndrome that was investigated.

6.6 Case definition for purpose of outbreak investigations

A case definition is a standard set of criteria to be used for deciding whether someone should be classified as a case of the disease under investigation. The case definition must:

- include information relating to person, place and time
- include signs and symptoms
- be clear as to whether suspected, probable or confirmed cases of disease will be utilised
- be clear as to whether a case is to be confirmed clinically, by laboratory, or by epidemiologic linkage

If the team wants to be sure to capture all cases, the case definition should be fairly broad, with minimal criteria for inclusion. Many investigations often start with a fairly broad case definition and this definition becomes more precise as the investigation proceeds or during analysis.

6.7 Outbreak investigation team

Investigating an outbreak is not a job for one person; it is a team effort with each member of the team having a specific function.

In Montserrat this would be the Surveillance and Response team and may include:

- A team leader, who should have strong epidemiologic skills. Usually this person is the Epidemiologist or other person designated by the CMO.
- A Public Health or Infection Control Nurse to collect and collate data and samples on cases and controls ***during the time of the outbreak***, as well as to collect and collate past data so that disease events over time can be observed.
- Environmental Health personnel to conduct site investigations and collect data and samples when appropriate.
- A Health Educator/Coordinator for health promotion within the community affected
- Laboratory support to ensure proper sample collection, preservation and transport, and confirm the etiologic or causative agent responsible for the outbreak.
- A clinician for diagnosis and patient care and management.
- A spokesperson should be designated – not necessarily from within the investigation team members – to communicate with the media so that clear, consistent messages are delivered to the public. It is important that the public receives accurate information from the Ministry of Health. (This person is usually the CMO.)
- Depending on the availability of resources and the size of the outbreak, one person may perform more than one of these roles. While each person has specific expertise, within the context of the investigation of an outbreak, one may be assigned other responsibilities by the Team Leader.

6.8 Outbreak report

Documenting and disseminating information on an outbreak for your own reference as well for colleagues is a crucial component of the investigation. Consideration should be given to publishing the results in a journal as information gained from an outbreak investigation is used to prevent additional outbreaks. Whether a report for publication or for your own records, the following format can be used as a template.

Introduction

- Background
- Reason for investigation

Methods

- Dates of investigation
- Site(s) of investigation
- Case finding – indicate what was done regarding case finding
- Laboratory specimens collected
- Describe response and intervention
- Describe statistical methods used for analysis

Results

- Date and location of first known case (index case)

- Results of additional case finding
- Laboratory analysis and results
- Describe key features of results of time, place and person analysis (include an epidemic curve)
- Results of response and evidence of impact

Discussion

- Based on result, describe the events leading to the outbreak
- Emphasize the lesson learnt from the incident.
- Limitations of the investigation

Conclusion and Recommendations

- Emphasize the lessons learnt from the outbreak or incident.

Appendices

- Questionnaires
- Maps
- Investigation forms
- References.

6.9 Case investigations

The main principle of a case investigation is to make an early diagnosis of a potentially emerging infectious disease and to detect, also as early as possible, the potential start of an outbreak.

The first objective, in any situation, will be to actively search for other similar cases. From there, two scenarios will be considered:

1. Other cases are detected – an assessment of the epidemic risk will determine if the investigation should then be equivalent to an outbreak investigation.
2. No other cases are detected – the investigation will then be looking at confirming or ruling out the diagnosis.

Regardless of which scenario occurs, it will be necessary to evaluate the threat of the introduction of a new disease, together with an evaluation for the potential for spread and the implication for the country.

The availability, or not, of an aetiological (laboratory) diagnosis at the time of the case investigation will determine what objectives to aim at and the appropriate protocol to follow.

A. If the diagnosis is known:

Objective No. 1 – To actively search for other cases

Activities:

a) Review existing recent epidemiological data
b) Actively collect missing information from non-reporting sites
c) Further seek for physicians' judgment about similar cases

Objective No. 2 – To assess the epidemic risk

Activities:

d) investigate contacts of the initial (index) case and other existing cases
e) collect samples appropriately, according to the situation (i.e., clinical, environmental, animal)

Objective No. 3 – To guide further public health interventions

B. If the diagnosis is NOT known

Objective No. 1 – To fully investigate the case to determine the diagnosis and potential for spread and the possibility of an emerging infectious disease

Objective No. 2 – To actively search for other cases

Activities:

a) review existing recent epidemiological data
b) actively collect missing information from non-reporting sites
c) further seek for physicians' judgment about similar cases

Objective No. 3 – To guide further public health interventions

It should be noted that in both situations, the order of the investigation may not follow the order of the objectives listed above. In most cases, more than one objective is pursued at the same time. Different emphasis may be given to the objectives based on the disease under investigation.

7. Post Disaster Surveillance

Introduction

Disasters can be natural, accidental or intentional and include events such as hurricanes, tropical storms, floods, earthquakes, volcanic eruptions, fires, and acts of terrorism including bio-terrorism.

Since communicable diseases thrive in post disaster climates, the potential for large scale outbreaks become real, as displaced populations are faced with disrupted public utilities and health services. The risk of communicable disease spread is heightened following a disaster; therefore there is need for intensified and enhanced surveillance.

7.2 .Pre-disaster

Routine surveillance data in pre-disaster or inter-disaster periods is important in assessing the communicable disease risk following a disaster. The risk of a particular disease resurging following a disaster depends on many factors, one of which is the endemic level of that disease. Routine data should be used as a baseline for post disaster surveillance activities.

Essential services (e.g. water and electricity) may be interrupted during a disaster and as a result contingency plans should be in place in the pre-disaster period (preparedness).

Persons involved in disaster response should make arrangements to have personal obligations met in order to avoid distractions and additional stress when a disaster strikes.

Well defined and understood relationships shall be established between the health sector and the Disaster Management Coordinating Agency. Clear responsibilities have to be established for disaster operations management.

7.3. Assessment of damage and subsequent disease potential

A rapid assessment should be initiated as early as possible, while awaiting a more detailed report. Information should be updated, displayed on wall maps and disseminated as soon as it becomes available.

At a local level, a rapid assessment of the extent of damage should place special emphasis on:

- Telecommunications
- Roads and bridges
- Telephone links
- Health facilities
- Areas flooded
- Water supply systems
- Sewerage systems
- Solid waste disposal systems
- Emergency accommodation facilities (shelters)

Epidemiologic factors which influence the potential risk of communicable disease transmission after a disaster include:

- Changes in pre-existing levels of disease
- Ecological changes resulting from the disaster
- Population displacement and changes in population density
- Disruption of public utilities and basic public and environmental health services
- Increase in Vectors

Predominant factors, influencing the modes of transmission of communicable diseases are for example:

- Over crowding in evacuation centres can increase transmission of diseases caused by person to person spread e.g. tuberculosis
- Poor sanitation practices e.g. interruption in proper garbage disposal may increase the risk of diseases such as leptospirosis
- Flooding can damage water treatment plants, pumping stations and distribution mains resulting in disrupted or contaminated supplies, increasing the risk of gastrointestinal illnesses.
- The accumulation of water following floods provides suitable breeding grounds for vectors such as mosquitoes that may, for example, contribute to a dengue outbreak.
- Interrupted electricity supplies or transportation systems may affect food storage conditions and subsequent food quality and safety increasing the risk of gastroenteritis and food borne illness.

Identification of post disaster surveillance needs and resources

Disease surveillance essentially involves the gathering of information that is critical for rationally planning, implementing and evaluating public health activities. Coordinated efforts that respond to real priorities are essential.

Surveillance during post disaster periods should be based on existing systems with minimum modification. The national epidemiologist should report directly to the coordinator with overall responsibility for health related activities.

Routine surveillance in non-disaster areas should continue as:

(a) Outbreaks in regions not affected by the disaster.
(b) Persons from the disaster areas may move to another area while incubating an infection.

While some needs may be peculiar to certain types of disasters, both in terms of surveillance activities and public health action, there are common basic areas which must be addressed:

- The National Disaster Plan for the Health Sector should be reviewed and updated annually and should address any deficiencies identified during simulation exercises or an actual disaster situation.
- Clear lines of communication need to be established and clear lines of command of the Health Disaster Coordinator and the Coordinator for surveillance (Epidemiologist)
- Mechanisms should be in place to allow ready access to baseline and other data including the use of reference maps.
- Clear reporting guidelines should be developed (what to report, to whom and how), including reports received from non-traditional sources.
- Guidelines and resources for the appropriate analysis of the collected surveillance data.
- Mechanisms for feeding field information to the command centre with provisions to cater for breakdown in normal communication systems. Appropriate feedback provisions to the field should also be in place.
- Backup laboratory services, the use of which should be rationalised.
- Suitable field equipment for monitoring and recording essential surveillance data, as well as for the collection and transport of clinical and environmental specimens.
- Inputs from epidemiologists at both the planning and field operation stages.
- Suitable mechanism for disseminating information and advice to the public.

7.5. Plan of action for surveillance response

Considerations, which need to be addressed in the establishment of post-disaster surveillance:

7.5.1 Establishing a post-disaster surveillance centre

The location of the centre will depend upon:

- Extent of the disaster, local or nationwide.
- Pre-disaster organisation of the health services.
- Communication facilities with special emphasis on telephone or radio links with national coordinating agency and field reporting units. Computer links could be especially helpful, where these exist and are not interrupted by the disaster itself. It is important to maintain rapid two-way flow of information between peripheral and central levels, at which critical and urgent decisions will have to be made.

7.5.2 Data collection and reporting

Reporting is a key element of surveillance, and emphasis should be placed on the sensitivity of the system to be able to detect minor changes in disease occurrence so that analysis and appropriate action can be taken immediately. This usually necessitates limiting the number of diseases under surveillance, becoming more flexible in regard to diagnostic criteria in laboratory work, and relying on the reporting of symptom complexes (syndrome reporting). **Daily syndromic reporting** is required for persons residing in an evacuation centre or seeking attention at a health facility.

- Use of case definitions and symptom complexes must be standardized throughout the surveillance period.
- Prompt reporting is important. Since the situation is changing, daily reporting is necessary. Collection and analysis of data should be conducted daily.
- Completeness of data may not be necessary or feasible in disaster situations. What is required is data that can be interpreted as an overall indicator on which appropriate and effective public health interventions can be based. The importance of negative reporting should be stressed.
- It is also important that information and reports from formal and informal sources should not be ignored. Action should be taken to confirm the source and reliability of the information and institute necessary measures.
- Monitoring activities should extend beyond disease occurrence to include other conditions which have public health implications e.g. information on the status of water supplies. Where disrupted treatment systems have been restored, testing for free and residual levels of chlorine should be done, and if access to laboratory facilities is available bacteriological testing should be carried out as well.

7.5.3. Feedback

Data collected should be analysed and the findings published in an official daily or weekly report. It should also contain tables and charts from the daily reports.

Further reference can also be obtained in the following manuals:

- Health Sector National Disaster Preparedness Plan (2000)
- “Public Health Surveillance; A Caribbean Communicable Disease Surveillance Manual for Action”, CAREC, 1999.

8. Contact Information

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9. Glossary of Terms*

Acceptability – the willingness of individuals and organisations to participate in the surveillance system.

Attack rate - An attack rate is defined as the number of new cases of disease during a specified time period, divided by the *total population at risk* during the same time period. This is usually multiplied by a factor of ten to make it a whole number. An attack rate is actually an incidence rate (that is rate of occurrence of new cases), but it is referred to as an attack rate during outbreaks.

$$\text{Attack rate} = \frac{\text{Number of new cases of a disease during a limited time period}}{\text{Total population at risk during the specified time period}} \times 10^k$$

Attack rates can be calculated for cohort studies as the total population at risk is known, but NOT for case control studies since this denominator is unknown.

Carrier - A person or animal that harbours a specific infectious agent in the absence of discernible clinical disease and serves as a potential source of infection. The carrier state may occur in an individual with an infection that is clinically inapparent (known as healthy or asymptomatic carrier) or during the incubation period, convalescence, and post-convalescence of an individual with a clinically recognizable disease (known as incubatory carrier or convalescent carrier). The carrier state may be of short (temporary or transient carrier) or long duration (chronic carrier).

Case-control study - A case control study is an observational study in which participants are selected on the basis of whether they have the disease under study (cases), or do not have the disease (controls). This is the type of study that is usually conducted for larger outbreaks for which it is either impossible or impractical to interview all the cases. The measure of association between the disease and the risk factor is the odds ratio (OR), which is taken as proxy for the relative risk (RR).

Case definition - A case definition is a standard set of criteria to be used for deciding whether someone should be classified as a case of the disease/syndrome under investigation. The case definition must

- include information relating to person, place and time
- include signs and symptoms
- be clear as to whether suspected, probable or confirmed cases of disease will be utilized
- be clear as to whether a case is to be confirmed clinically, by laboratory, and/or by epidemiologic linkage

If the team wants to be sure to capture all cases, the case definition should be fairly broad, with minimal criteria for inclusion. Many investigations often start with a fairly broad (sensitive) case definition and this definition becomes more precise (specific) as the investigation proceeds, and/or during analysis.

Case investigation form - A case investigation form is one used to collect information on a case under investigation. It should always contain basic demographic information about the case such as name, age, gender and contact information such as address and phone number. Contact details are essential in the event additional information is required and for targeting public health interventions.

- *from "Public Health Surveillance; A Caribbean Communicable Disease Surveillance Manual for Action", CAREC, 1999.

Information such as occupation and place of employment would be important if there was some suspicion that the exposure or disease was related to one of these factors.

A case identification (ID) number is useful if a computer is being used for analysis. The case ID number on the form and on the record in the computer should be the same, so that if an error was discovered on the record during analysis, the form could easily be referred to for verification.

Date of onset of illness is essential for determining incubation periods and identifying etiological agents. Time of onset of illness can also be collected if it would be useful (e.g. in food borne disease outbreaks) and if it is likely to be reliable.

Signs and symptoms are also essential for identifying etiological agents. They should be relevant to the disease under investigation.

If patient specimens had been obtained, information on these, such as date of collection and results should also be included on the form.

In a food borne disease outbreak, food history is always essential to identify the source of the outbreak. If the exposure occurred at a specific event or function, a list of the foods served should be used. If the time of exposure is not known, then a food history for a specified time should be used.

Additional information such as travel history, housing conditions, etc. can be important depending on the source of infection.

Finally, there should always be a place for additional comments or remarks and for the interviewer completing the report to sign and date it.

Cluster - aggregation of relatively uncommon events or diseases in space and/or time in amounts that are believed or perceived to be greater than could be expected by chance. Putative disease clusters are often perceived to exist on the basis of anecdotal evidence, and much effort may be expended by epidemiologists and biostatisticians in demonstrating whether a true cluster exists. With modern molecular laboratory techniques, clusters of infections with "identical" organisms can be more accurately identified.

Cohort study - A cohort study is an observational study in which participants are selected on the basis of whether they had an exposure under study or not. The cohort is the total group of persons with a possible risk of the exposure that is being investigated in the study. Cohort studies are usually conducted for small, well defined outbreaks, when it is relatively easy to reach all the persons involved. The measure of association between the disease and the risk factor is the rate ratio or relative risk (RR).

Confidence intervals (CI) - the computed interval with a given probability, e.g., 95%, that the true value of a variable such as a mean, proportion, or rate is contained within the interval. This is a measure of statistical significance; if a confidence interval includes the value 1.0, the study findings are said to be not statistically significant at the given level of certainty.

Confounding –
1. A situation in which the effects of two processes are not separated. The distortion of the apparent effect of an exposure risk brought about by the association with other factors that can influence the outcome.
2. A relationship between the effects of two or more causal factors as observed in a set of data such that it is not logically possible to separate the contribution that any single causal factor has made to an effect.
3. A situation in which a measure of the effect of an exposure on risk is distorted because of the association of exposure with other factor(s) that influence the outcome under study.

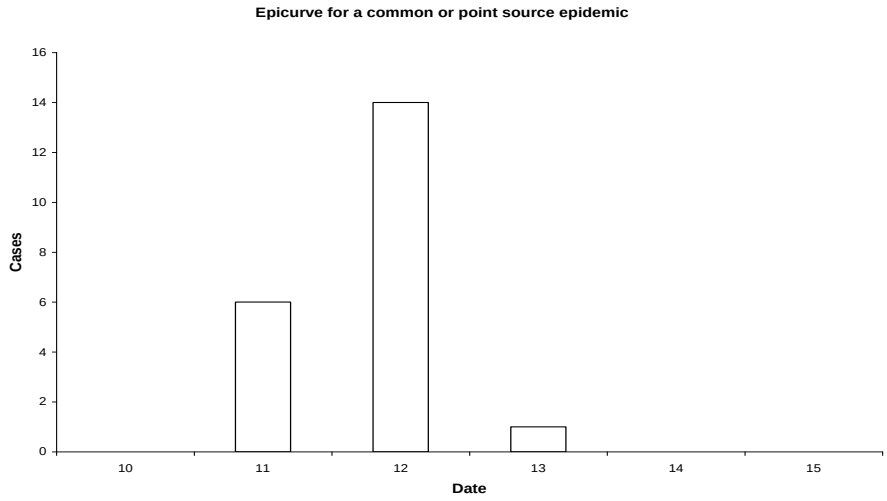
Endemic – The constant presence of a disease or infectious agent in a given geographical area or population group; it may also refer to the usual prevalence of a given disease within such area or group.

Epidemic - An epidemic is the occurrence in a community or region of cases of an illness, specific health-related behaviour, or other health-related events clearly in excess of normal expectancy

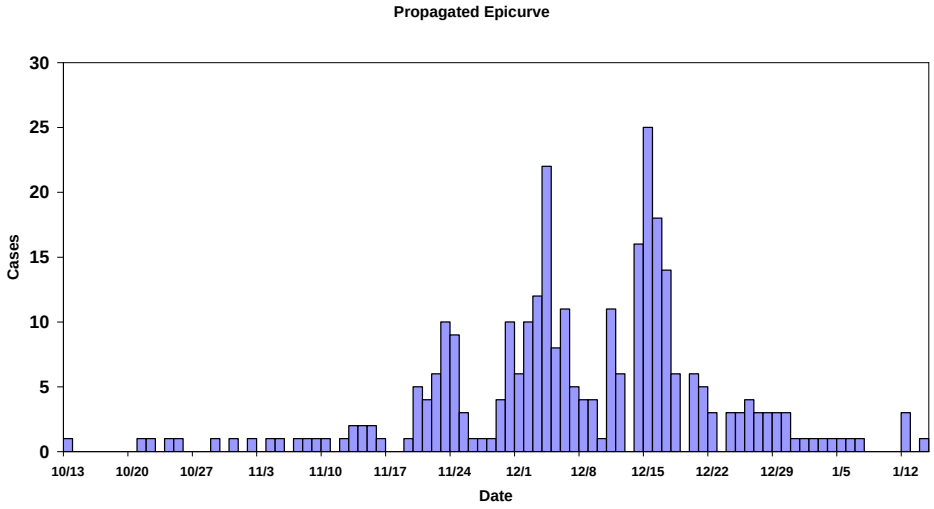
Epidemiology – Is the study of the distribution of health-related state or events and their determinants in specified populations according to time and place, and the application of the study to prevent and control health problems.

Epicurve - An epidemic curve or epicurve as it is more commonly called is a graph of the occurrence of cases over time. The number of cases is shown on the vertical (Y) axis and time is shown on the horizontal (X) axis. There are two types of epicurve:

- The epicurve for a point or common source epidemic (example given below). This curve usually has a build up of cases to the peak of the epidemic and then tails off. If there is a long exposure to the source it is called a "continuous common source" epidemic and the shape will be a plateau rather than a peak. Sometimes there are outlier cases, which may or may not be related to the epidemic. A case occurring well before the other cases in an outbreak could be a child who was fed early, or a cook who had an early taste of a contaminated meal. A case occurring well after an outbreak could be someone who unknowingly ate leftovers from a contaminated meal and often this person has more severe illness than the other patients in the outbreak.



- The propagated epicurve (example given below). In this situation, there is person to person spread. This epicurve usually consists of a series of peaks, continuing over time, one incubation period apart.



Flexibility – the ability of a surveillance system to adapt to changing needs such as the introduction of a new disease into a population.

Hypothesis - is a supposition based on known information to be used for further investigation. It should be as precise as possible and tested during the investigation. It should incorporate all known clinical, laboratory, and epidemiological facts, as well as known facts about the disease and environmental information if available. The hypothesis could include the source of infection, mode of transmission and risk factors for the disease.

Incidence - is the number of <u>new cases</u> of disease during a specified time period, divided by the total population at risk during the same time period. This is usually multiplied by a factor of ten to make it a whole number.

$$\text{Incidence rate} = \frac{\text{Number of new cases of a disease during a specified time period}}{\text{Total population at risk during the specified time period}} \times 10^{k}$$

Incidence rates can be calculated for cohort studies as the total population at risk is known, but NOT for case control studies since this denominator is unknown.

Line listing - A line listing is a list of information on persons in a study. It contains one line of information per person.

Example of a line listing:

Name	Age(Yrs)	Gender	Residence	Diarrhoea	Cramps	Fever	Vomiting	Date of onset
CM	21	M	Emtown	Y	Y	N	N	1 June
VFG	32	M	Elltown	Y	Y	N	N	11 June
SD	45	M	Aytown	Y	Y	N	Y	11 June
LJ	18	F	Efftown	Y	N	Y	N	11 June
HE	44	M	Alchtown	Y	N	N	N	11 June

Measure of association - a quantity that expresses the strength of association between variables. Commonly used measures of association are differences between means,

proportions or rates, the rate ratio, the odds ratio, and correlation and regression coefficients.

Odds ratio - is the ratio of two odds (odds compares the chance of an event happening to it not happening). Odds ratio is defined as the odds of exposure among the cases divided by the odds of exposure among the controls.

$$\text{Odds ratio} = \frac{a}{b} \Big/ \frac{c}{d} = \frac{a \times d}{b \times c}$$ (Please refer to the section on two by two tables below)

If an exposure has an odds ratio of greater than 1, the exposure may be a risk factor for the illness under investigation.

If an exposure has an odds ratio of less than 1 the exposure may be a protective factor.

If the odds ratio is equal to 1 then the exposure has no effect on the outcome, it can be neither a risk factor nor a protective factor.

Outbreak -An outbreak is an epidemic limited to a localised increase in the incidence of disease.

P-value - P-value is a probability value. It is the probability that a certain finding or association between an exposure and a disease is not real and that it occurred due to chance alone. The p-value is usually interpreted in conjunction with the measure of the confidence interval.

A p-value of less than or equal to 0.05 or 5% means that there is less than a 5% probability that the association found was due to chance. The association is then said to be statistically significant.

A p-value of greater than 0.05 or 5% means that there is a greater than 5% probability that the association occurred by chance. The association is therefore not considered to be statistically significant.

A statistically significant finding in a study does not mean that chance could not have accounted for the association, only that it was unlikely to have done so. Likewise, a finding that is not statistically significant does not mean that the association occurred by chance, only that it cannot be excluded as a likely explanation.

Positive Predictive Value – the proportion of cases reported by a surveillance system who are otherwise confirmed as having the condition being monitored.

Power - the ability of a study to demonstrate an association between an exposure and an outcome if one exists. Power is influenced by the sample size, study design, frequency of the condition being studied and the magnitude of the effect.

Prevalence - the total number of cases of disease during a specified time period, divided by the total population at risk during the same time period. This is usually multiplied by a factor of ten to make it a whole number.

$$\text{Prevalence} = \text{Total number of cases of a disease during a specified time period} \times 10^k$$
$$\text{Total population at risk during the specified time period}$$

Rate difference - A rate difference is the difference between 2 rates, one subtracted from the other.

Rate difference for exposure ‘x’ = Attack rate for those exposed to ‘x’ - Attack rate for those not exposed to ‘x’.

Relative Risk (RR)
1. The ratio of the risk of disease (or death) among the exposed to the risk among the unexposed; this usage is synonymous with risk ratio.
2. Alternatively, the ratio of the cumulative incidence rate in the exposed to the cumulative incidence rate in the unexposed, i.e., the cumulative incidence ratio.
3. The term relative risk has also been used synonymously with odds ratio and, in some biostatistical articles, has been used for the ratio of the forces of morbidity.

Representativeness – the ability of a surveillance system to supply reliable and unbiased data on the occurrence of health events and its distribution in populations (by person, place and time). If conditions are met, the information provided by the surveillance system is said to be representative of the “true” distribution of the health events within the whole population.

Sensitivity – describes the ability of a surveillance system to reliably detect the cases of a given disease (true positive) under surveillance. It includes the completeness of case reporting and the ability to detect epidemics. The sensitivity of a surveillance system is a proportion, expressed as a percentage. An outbreak investigation may be a practical opportunity to measure the sensitivity of a surveillance system.

Serotype (or serovar) – a subdivision of species or subspecies distinguishable from other strains of infectious agents on the basis of antigenic characteristics.

Simplicity – the simplicity of a surveillance system refers to its structure and ease of operation. Surveillance systems should be as simple as possible while meeting its objectives.

Sporadic case – occurring irregularly, haphazardly from time to time, and generally infrequently; also, a case or cases NOT associated with a known outbreak.

Statistically significant association – Usually the level of statistical significance is stated by the p-value (see p-value).

Strength of association – the magnitude of the measure of association (see above); for example, the size or value of the odds ratio (or risk ratio) is a measure of the strength of association between an exposure and an illness or other outcome—the larger the odds ratio, the stronger the association.

Timeliness – timeliness is the ability of the surveillance system to take appropriate public health action (including reporting), based on the urgency of the problem and the nature of the public health response.

Two by two table - A two by two table is a table with 2 rows and 2 columns. It is a simple way of presenting data, with the exposure (Yes or No) in rows and the outcome, usually the disease under investigation (Yes or No) in columns.

Outcome

Exposure	Yes	No	Total
Yes	a	b	a + b
No	c	d	c + d
Total	a + c	b + d	N

Vector - in infectious disease epidemiology, an insect or any living carrier that transports an infectious agent from an infected individual or its wastes to a susceptible individual or its food or immediate surrounding. The organism may or may not pass through a developmental cycle within the vector.

Vehicle (of infection transmission) - the mode of transmission of an infectious agent from its reservoir to a susceptible host. This can be (e.g.) person to person, food, or vector-borne.

10. References of Interest

10.1 Books and Manuals

CAREC. Public Health Surveillance Manual, a Caribbean Communicable Disease Surveillance Manual for Action. Trinidad: CAREC 1999

Chin, J (Ed). Control of Communicable Diseases Manual, 15th Edition. Washington: American Public Health Association, 2000

Last, J (Ed). A Dictionary of Epidemiology. Oxford University Press USA, 2000

PAHO. Measles Eradication, Field Guide. Technical Paper number 41, Washington D.C., PAHO, 1999

Teutsch, S. & Churchill, R. Principles and Practice of Public Health Surveillance (2nd edition). Oxford University Press, New York, 2000

10.2 Websites

Antimicrobial resistance information bank	**http://oms2.b3e.jussieu.fr/arinfobank**
Caribbean Epidemiology Centre (CAREC)	**http://www.carec.org**
Cholera	**http://www.who.int/csr/disease/cholera**
Centres for Disease Control and Prevention	**http://www.cdc.gov**
Deliberate use of biological and chemical agents	**http://www.who.int/csr/delibepidemics/**
Dengue (DengueNet)	**http://oms2.b3e.jussieu.fr/DengueNet**
Eradication/elimination programme	**http://www.who.int/infectious-disease-news/**
Filariasis	**http://www.filariasis.org**
Geographical information systems (GIS)	**http://www.who.int/csr/mapping/**
Global atlas of infectious diseases	**http://globalatlas.who.int**
Health topics	**http://www.who.int**
Infectious diseases	**http://www.who.int/health-topics/idindex.htm**
Influenza network (FluNet)	**http://oms.b3e.jussieu.fr/flunet/**
Integrated management of childhood illnesses	**http://www.who.int/chd/**
International travel and health	**http://www.who.int/ith/**
Intestinal parasites	**http://www.who.int/wormcontrol/**
Leprosy	**http://www.who.int/lep/**
Malaria	**http://www.rbm.who.int**
Newsletter *(Action against infection)*	**http://www.who.int/infectious-disease-news/**
Outbreaks	**http://www.who.int/csr/don**
PAHO	**http://www.paho.org**
Poliomyelitis	**http://www.who.int/gpv/**
Rabies network (RABNET)	**http://oms.b3e.jussieu.fr/rabnet**
Report on infectious diseases	**http://www.who.int/infectious-disease-report/**
Salmonella surveillance network	**http://www.who.int/salmsurv**
Smallpox	**http://www.who.int/csr/disease/smallpox/**
Surveillance and response	**http://www.who.int/csr/**
Tropical disease research	**http://www.who.int/tdr/**
Tuberculosis	**http://www.stoptb.org**
Vaccines	**http://www.who.int/gpv/**
Weekly epidemiological record	**http://www.who.int/wer/**
WHO	**http://www.who.int**
WHO infectious disease websites (updated links available from this site)	**http://www.who.int/infectious-disease-news/IRCcatalogue/index.html**

Appendix 1 - Protocol for Tuberculosis Control (MONTSERRAT)

Overall Objectives of TB Control

To reduce and eventually eliminae Adeath, disability, illness, emotional trauma, family disruption and the social stigma still caused by Tuberculosis.

Public Health Objective

- To interrupt and to prevent transmission of Tuberculosis
- To prevent the development of Drug Resistance
- To identify and cure the infectious cases
- To treat the infected cases.

The public health objectives will be achieved if persons who are infected are rendered non-infectious.

Clinical Description :

(Refer to case definitions in Communicable Diseases Manual)

Control Measures

- To identify and investigate all confirmeed cases of TB and their contacts as soon as possible after confirmation.
- To provide information to the Medical Officer of Health as investigations are completed.
- To identify all persons with suspected or confirmed TB disease and ensure that they recieve appropriate treatment, (Ideally DOTS)
- To ensure that persons who are at high risk for progression from infection to active disease, recieve preventive therapy and do not develop disease.
- To ensure that TB cases abd identified contacts recieve appropriate medical care and remain under medical supervision until completion of course of treatment.
- To monitor and document the treatment status of all patients with TB and correct deficiencies.
- Conduct clinics that provide clients, contacts , families and the public, provide counselling re TB prevention and control, and the importance of medication compliance.
- To compile statistical data on the number of TB cases and contacts investigated.
- To work closely with the following members of the health team **:**
  Physician Specialist
  Infection Control Nurse
  Laboratory Staff
  Radiography Staff
- Provide each Community Health Centre with an updated list of all Tuberculosis cases in their area so that they can reinforce health education and provide additional supervision.
- Improve those social conditions, which increase the risk of infection.
- The Public Health Nurse does an initial investigation. All household and close contact are screened by mantoux test followed by Chest X-rays.
- For mass mantoux screening, chest X-rays are done if reading is 10 mm or more.
- After the index case is discharged from hospital, the nurse visits the home regularly to emphasize the importance of chemotherapy snd clinic attendance for clients on treatment as well as contacts on prophylaxis.
- Observe present health household contact for any sign of clinical maniufestation of TB.
- Administer DOTS therapy.
- Monitor Drug compliance of cases and their contacts.
- Cases or contacts who have defaulted are requested to attend the Medical Outpatients Clinic/DMOs Clinic.

In-patient Clinical Management

Diagnosis

Chest X-ray

Sputum positive Smear – AFB (Usually 3 specimen collected over 3 consecutive days).

Management & follow up of TB Patients

Patients with Proven TB- seen at clinic

1. Every week X 1 month
2. Every 2 weeks X 4 visits
3. Every month X 3 visits
4. Every 3 months X 2 visits

This should bring patient to completion of treatment. Patient should then be follpowed up every 6 month x 2 visits, then annually x 3 visits, then discharged if condition is satisfactory.

X-ray Examination are done at 3 months, 6 months, 1 year and on completion of treatment annually until discharged. X-rays must be done more frequently if clinically indicated.

Sputum Test is done if patient is coughing or if condition suggests deterioration (relapse or reaction)

Blood Investigation done at the discretion of the Doctors and on completion of treatment.

Patient with clinical TB (not Proven**)** – initially given 2 weeks appointment until culture reports are available. I f culture is positive, follow up as above. If negative, continuation of treatment will depend on the respective case.

Routine Investigation

1. Mantoux test
2. Sputum- (C/S/AFB) Culture / Sensitivity
3. Blood
4. U+E's
5. FBC with diff.
6. LFT's
7. VDRL
8. HIV

Routine for follow up of Contacts

All contacts to have MANTOUX Test and Chest X-ray

Institutions, for example, schools or where a large number of persons are involved :

- Mantoux test only and Chest X-rays of those with positive reading.
- All contacts should have mantoux test and chest x-ray.
- Contacts with normal X-ray and positive mantoux test(up to 35 years) are given prophylactic treatment for one year(INAH 10 mg per kg/body weight –up to 300mg dail y).
- Contacts with suspicious X-ray must be admitted to Hospital for further investigations.
- Contacts with normal X-rays and negative mantoux (expected young children who have cose contacts), no treatment is needed but tests are repeated in three (3) months,
- Young children who are close contacts of smear positive patients should have prophylactic treatment even though mantoux test is negative and x-ray is normal.
- Contacts (not close) whose test remains negative after 3 months may be discharged.

- Converters (mantoux negative to positive) must be given prophylactic treatment for 9 month.
- * All persons having Inah must be given Vitamin B 6 daily.

Notification and Investigation of TB

Upon reciept of a notification the Medical Officer (DMO/Phhysician Specialist) and the Nursing Staff are informed and the control measures, investigation and follow-up care as outlined above are carried out.

Nursing Care – Patient Education

- Notify the Epidemiology Unit
- Isolation until Smear returns negative
- Disposal of sputum by incineration
- Q4h vital signs
- Anit pyretic measures
- Administration of Anti TB Medication
- Monitor LFT's & FBC – once weekly
- Bi-weekly weights- High calories, high protein diet
- Occupational therapy
- Education re the importance of medication compliance (if missed or stopped at any time the patient is referred back to clinic for reassessment.)
- Patients should avoid extreme cold and ahdhere to proper diet
- Keep clinic appointment for follow up care and evaluation.

Protocol For DRug Therapy

- INAH (Isoniazide) 300 mgs – daily
- Ethambutol 1200 mgs – daily
- Rifampicin 600 mgs – daily
- Pyrazinamide 1500mgs – daily
- Vitamin B6 – daily
- Streptomycin 0.75 mgs IM daily in specified cases.
- Anti TB medication is precribed for minimum of 6-12 months.
- Patients with Tuberculosis and HIV infection is treated with Anti TB Medication for a minimum of 12 months.
- Patients with TB infection (latent TB) and HIV are treated with INAH and Vitamin B6 for a minimum of 1(one) year.

Patients on streptomycin are observed and monitored for toxicity, tinnitus or deafness.

Appendix 2 – Protocol For Investigating Vector Borne Diseases

1) Determine if the suspected case/clinical case of malaria meets the case definition of the disease. (refer to the Communicable Disease in Man Manual for case definition.
2) Schedule an immediate interview with the suspected/confirmed case using the appropriate case investigation form.
   The following information should be collected
   - List of contacts and addresses
   - Travel history.
3) Inform the Epidemiologist and/or Environmental Health Department of case or suspected case.
4) Arrange to visit household and neighborhood with a team including the Environmental Health Officer/Inspector.
4) Collect samples from household members and close neighbours with or withour signs of the disease.

Purpose of Investigation

- To actively search for other cases
- To investigate contact and try to identify source of infection.
- To educate members of the household on prevention strategies i.e such as taking chemoprophylaxis before travelling to endemic areas and mosquito bite prevention.
- To initiate vector control activities.

All other cases linked to the index case must be referred to the hospital for clinical management. A report should be written on the investigation and all actions and recommendations documented.

Checklist

- Health Education materials on vector borne diseases.
- Equipment /supplies for obtaining specimens.
- Specimen containers (purple top) slides to prepare smears, brown top for serum
- Line listing form
- Case investigation Forms
- Appropriate transport medium.
- Inform the aboratory of likely number of samples to expect.

Appendix 3 - Protocol for Investigating Suspected Measles and other Vaccine Preventable Diseases

(All suspected measles cases must be reported immediately to the Surveillance Unit and EPI Manager.)

All suspected cases ***must*** meet the case definition (for definition refer to Communicable Disease in Man Manual).
All initial investigations should be carried out, whenever possible by Public Health trained staff from the clinic. Every efffort should me made to obtain acute and convalescent srem in order to increase the likelihood of confirming the first suspected case/cases of an outbreak. Efforts shgould also be made to determine why any case occured :

- Was the individual unvaccinated ?
- Were there breaks in the cold chain ?
- Was this as a result of a vaccine failure ?

Answers to the above questions should be used as a guide for corrective efforts.

First steps in Investigation
As soon as possible it is necessary to determine whether the reported RASH Illness with FEVER fits the case definition for suspected measles. All suspected cases should recieve a case identifiacation number, which will assist in the tracting of the case. Several important perliminary steps should be taken and certain information collected :

Source of report	How did the first case come to the attention of health aouthorities ? Obtain name, address, telephone number, title of person providing you with this information.
Locate area	Indicate on a map. Enquire about population size.
What's been done	List any actions already taken
Coverage rates data review	Include both official and unofficial estimates
Data Review	Obtain existing coverage data & prior reports of cases in the area.
Resources	Determine what resources are available at all levels for outbreak (transportation, vaccine, cold chain material etc.). Manpower should include experienced clinicians, field staff to assist in the outbreak investigation including staff from other departments/programmes, Drivers, District Nurses, Student Nurses.
Plan of Action	Include the actions to be taken, and time table for visit. Notify superior and other members of staff re plan.
Specimen	Arrange in advance, for shipment and handling of specimens. Provide laboratory with an estimate of the number and type of specimens to expect. (remember to complete appropriate laboratory requisition forms (CAREC and Local forms).
Meeeting	Inform appropriate health authorities when and where the team will arrivie, and ask that specific health staff be present.

Supplies Organise neccessary supplies to take with you. (see checklist)

Field Material Checklist

Vaccine — Adequate supply of vaccines based on estimated target population. Have adequate supply of syringes.

Cold Chain — Cold Chain materials- Ice pack , Cold boxes, Vaccine Carriers Refrigerator or freezer (if indicated) vaccine monitor thermometers.

Specimens — Ice pack freezing capacity
Specimen collection materials

1. Insulated boxes with ice packs to transport specimens
2. labels
3. adhesive tapes
4. plastic bags

Forms — Adequate supplies of Forms

1. Rash illness with fever linelisting
2. Suspected cases linelisting
3. Case investigation forms
4. Specimen laboratory forms
5. Specimen tracking form
6. Coverage evaluation form
7. Outbreak Immunization tally form
8. Outbreak surveillance orm
9. Outbreak control summary
10. Refrigerator monitor form

Visiting the cases
In addition to the suspected case any other rash – Illness with fever should be investigated as soon as possible. Case definition should be strictly followed regardless of vasccination staus.

- Collect all available demographic and clinical infformation on thecase. However if the number of cases are large use only the line listing of suspected cases.
- Begin entering data into the suspected case line listing form.
- If the cases os an outbreak are seen within 2 weeks after the onset of rash, collect acute blood specimen and submit to laboratory. An additional blood specimen (convalescent) must be collected 4 to 6 weeks later.
- If the only cases in an outbreak are seen more two weeks after the onset of rash collect a single blood specimen (convalescent) and submit to the laboratory.
- Establish time and place for continued follow up in order to (1) collect additional clinical information if neccessary and (2) collect additional blood specimens.
- Inform surveillance sites and surveillance coordinators an surrounding areas when a suspected case has been identified
- If onset of rash was less than 2 months previously initiate community investigation to identify additional cases and institute control measures.
- If onset of rash was more than 2 months and no other cases has since been eported or identified, initiate community investigation to identify additional cases and start vaccination activities if no higher priority exists.
- Conduct contact tracing to determine source of an outbreak or if other areas are exposed or experiencing similar problems.

Finally write a report on the investigation and your recommendations

Appendix 4 - CAREC Weekly Reporting Forms

Expanded Programme on Immunisation (EPI)

COUNTRY: _____ **WEEK NO.** _____

RASH AND FEVER SURVEILLANCE

A. # OF SITES REPORTING: _____

B. # OF SITES WHICH SHOULD REPORT: _____

C. # OF NEW SUSPECTED **MEASLES / RUBELLA** CASES: _____

I.D. NO.	NAME OF CASE (S)	DATE REPORTED	DATE OF ONSET OF RASH	DATE OF ONSET OF FEVER
2002-				
2002-				
2002-				
2002-				
2002-				
2002-				

D. TOTAL # AND I.D. OF NEW CONFIRMED CASE(S) OF **MEASLES / RUBELLA** FOR THIS WEEK: _____

E. TOTAL # AND I.D. OF DISCARDED CASE(S) **OF MEASLES / RUBELLA** FOR THIS WEEK: _____

F. TOTAL # AND I.D. OF NEW SUSPECTED CASE(S) OF **CRS** FOR THIS WEEK: _____

G. TOTAL # AND I.D. OF CONFIRMED CASE (S) OF **CRS** FOR THIS WEEK: _____

ACUTE FLACCID PARALYSIS

A. # OF SITES **REPORTING**: _____ B. # OF SITES WHICH **SHOULD** REPORT: _____

C. # OF NEW SUSPECTED CASE(S) OF **AFP** FOR THIS WEEK: _____ D. CUMULATIVE TOTAL **AFP**: _____

I.D. NO.	NAME OF CASE (S)	DATE REPORTED	DATE OF ONSET OF PARALYSIS
2002-			
2002-			
2002-			
2002-			

YELLOW FEVER

A. # OF SITES REPORTING: _____ B. # OF SITES WHICH SHOULD REPORT: _____

C. # OF NEW SUSPECTED CASE(S) **Y/ F** FOR THIS WEEK: _____

REPORTED BY: _____ **SIGNATURE** _____

DATE: _____

QUARTERLY AIDS REPORTING FORM

SYNDROMIC SURVEILLANCE OF COMMUNICABLE DISEASES

COUNTRY _____

Week # _____ *(epidemiological)*

Week ending ____/____/____

Total number of reporting sites_____

Number of sites reporting this week_____

Syndromes	No. of cases
Fever and haemorrhagic symptoms	
Fever and neurological symptoms	
Fever and respiratory symptoms (ARI) < 5 yrs	
Fever and respiratory symptoms (ARI) ≥ 5 yrs	
Gastroenteritis < 5 yrs	
Gastroenteritis ≥ 5 yrs	
Undifferentiated Fever < 5 yrs	
Undifferentiated Fever ≥ 5 yrs	

Were any outbreaks/cluster/unusual events observed this week? ☐ YES ☐ NO

Reminder: In addition to reporting outbreaks/clusters/unusual events on this form, they must also be reported immediately to CAREC

Reminder: Fever and rash & Acute Flaccid Paralysis will continue to be reported through the Expanded Programme on Immunization weekly notification and reporting system

Send form to: CARIBBEAN EPIDEMIOLOGY CENTRE (CAREC),
P.O. Box 164, Port of Spain, Trinidad
Telephone: 1-868-622-4261, Facsimile: 1-868-622-1008
Email: carec-epidemiology@carec.paho.org

CARIBBEAN EPIDEMIOLOGY CENTRE (CAREC)

Name of Country:		**Year** **Reporting Period:**		**Quarter** 1 2 3 4
Unit/Programme:		**Date of Report:**		
Total number of AIDS cases reported during this period:		Total number of AIDS deaths reported during the reporting period[1]:		
Age (years)	**Male**	**Female**	**Unknown**	**Total**
Under 1 year				
1-4				
5-12				
13-14				
15-19				
20-24				
25-29				
30-34				
35-39				
40-44				
45-49				
50 and >				
Unknown				
Total Cases				
Route of transmission †				
MSM[2]				
Heterosexual				
MTCT of HIV[3]				
IVDU[4]				
Blood and Blood Products				
Others				
Unknown				
Total Cases				
Important Sector of Employment[5]				
1				
2				
3				
4				
5				
Unemployed				
Other				
Unknown				
Total Cases				

† Hierarchy of reporting is in the order listed in the table.

[1] Causes of Death should be analysed during quality of care surveys at country level
[2] Men who have Sex with Men, including those who also have sex with women
[3] Mother-to-Child Transmission of HIV
[4] Intravenous Drug Use
[5] The legal minimum age limit for employment must be taken into consideration. Information regarding Sector of Employment should focus on major national developmental sectors including self-employment; it will assist National Decision-makers to understand national sectors the most affected by AIDS.

AIDS case defined as patient fulfilling the following: HIV positive test with major and minor signs or an indicator disease

AIDS death is defined as death caused by opportunistic infections of AIDS and/or HIV Wasting Syndrome

QUARTERLY HIV REPORTING FORM

CARIBBEAN EPIDEMIOLOGY CENTRE (CAREC)

Name of Country:		**Year** **Reporting Period:**		**Quarter** 1 2 3 4
Unit/Programme:		**Date of Report:**		
Total number of HIV cases reported during this period:		HIV Seroprevalence rate in study(is) concluded during this period among targeted group(s) Blood donors: Pregnant Women: MSM: CSW: STI Patients: Others:		
Age (years)	**Male**	**Female**	**Unknown**	**Total**
Under 1 year				
1-4				
5-12				
13-14				
15-19				
20-24				
25-29				
30-34				
35-39				
40-44				
45-49				
50 and >				
Unknown				
Total Cases				
Route of transmission †				
MTCT of HIV*				
MSM**				
IVDU***				
Blood and Blood Products				
Heterosexual				
Others				
Unknown				
Total Cases				
Important Sector of Employment[5]				
1				
2				
3				
4				
5				
Unemployed				
Other				
Unknown				
Total Cases				

* Mother –to Child Transmission of HIV
** Men who have Sex with Men: homosexuals and bisexuals
*** Intravenous Drug Use
[5] The legal minimum age limit for employment must be taken into consideration. Information regarding Sector of Employment should focus on major national developmental sectors including self-employment

Behavioural Co-factors such as the history of STI's, the history of Cocaine Crack Users, Commercial Sex Workers, Sex with Commercial Sex Workers (male or female) will be discussed in the component on Behavioural Surveillance

CARIBBEAN EPIDEMIOLOGY CENTRE QUARTERLY STI REPORTING FORM

NAME OF COUNTRY:	**YEAR …….. Quarter** **REPORTING PERIOD: 1 2 3 4** **DATE OF REPORTING:**
UNIT/ PROGRAMME:	**STI Prevalence Rate in Populations concluded during this period among specific groups:**

Total Number of STI Cases Reported during this period:	Study group:	Blood donors	Pregnant women	MSM	FCSW
	Name of STI[1]:				
		%	%	%	%
		Others (indicate) : Name:		%:	

SYNDROMES	AETIOLOGIES	Sex	AGE GROUPS					Age &/or Sex[2] unknown	TOTAL
			10 - 14	15 –19	20 - 24	25 - 49	50+		
Urethral Discharge ***(Males only)***	Gonorrhoea	M							
	Chlamydia	M							
	Non-Specific Urethritis (NSU)	M							
	Unknown	M							
Genital Ulcer ***(Males & Females)***	Syphilis	M							
		F							
	LGV	M							
		F							
	HSV	M							
		F							
	Chancroid	M							
		F							
	Unknown	M							
		F							
Vaginal discharge ***(Females Only)***	Gonorrhoea	F							
	Chlamydia	F							
	Trichomonas	F							
	Bacterial Vaginosis	F							
	Others	F							
	Unknown	F							
No Syndrome, but Laboratory test positive ***(Males & Females)*** (serology positive)	Syphilis	M							
		F							
	HSV	M							
		F							
	Chlamydia	M							
		F							
	Other	M							
		F							
TOTAL									

INFANTS		TOTAL
Ophthalmia Neonatorum	Gonorrhoea	
	Chlamydia	
	Other	
	Unknown	
Congenital Syphilis		

HSV: Herpes Simplex Virus Infections (Only the first episode should be reported)
LGV: Lymphogranuloma venereum MSM: Men who have sex with men
FCSW: Female Commercial Sex Workers [1] Indicate disease under study e.g. chlamydia, syphilis

SYNDROMIC DIAGNOSIS FLOWCHART

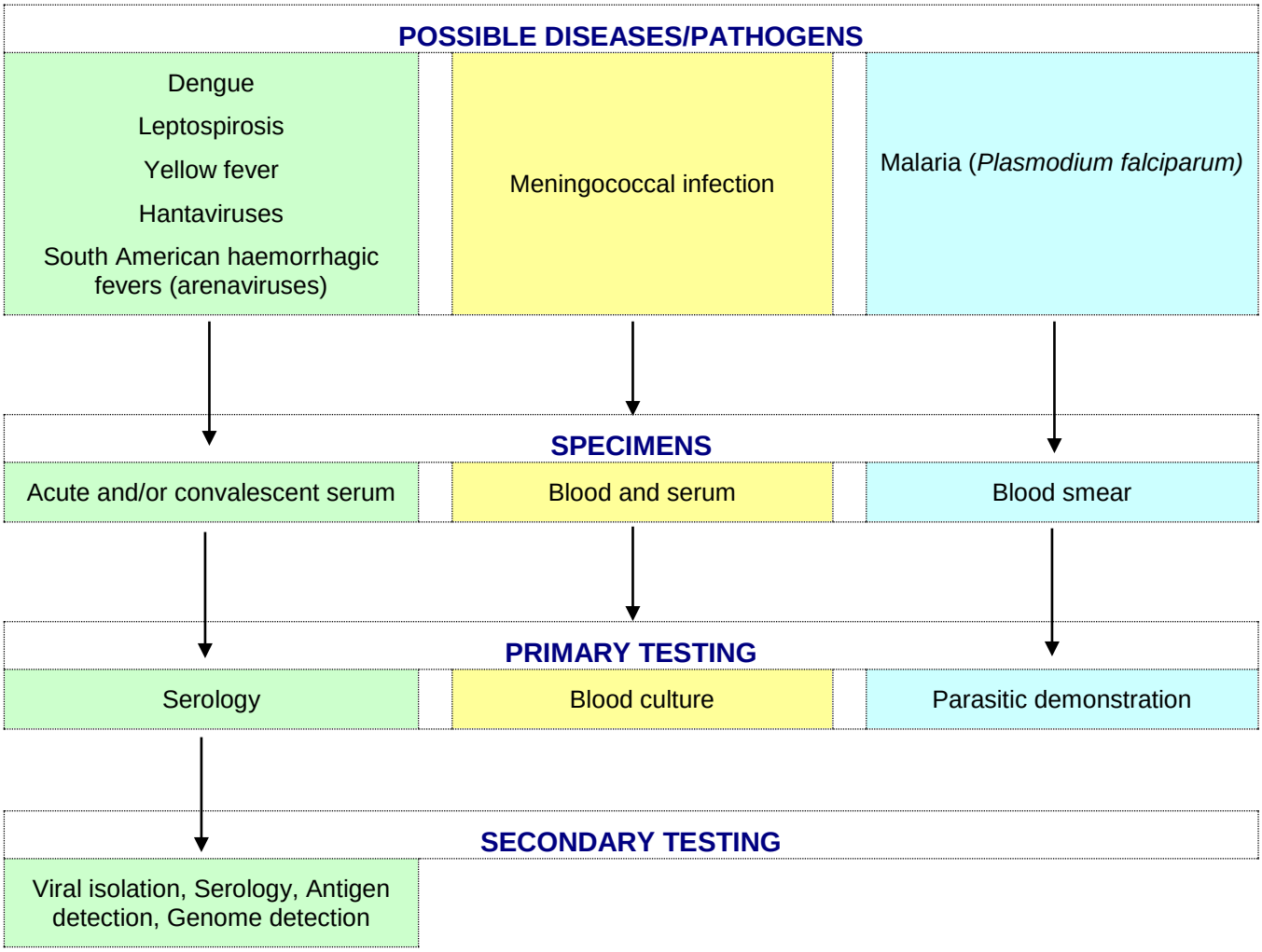
FEVER AND HAEMORRHAGIC SYMPTOMS

CASE DEFINITION

Fever (> 38.0°C or 100.4°F) with at least one haemorrhagic (bleeding) manifestation, with or without jaundice

Examples of haemorrhagic manifestations
- Purpura
- Epistaxis
- Haemoptysis
- Melena

EPIDEMIOLOGICAL DATA
- Previously healthy person
- Recent travel
- Prior medication
- Contact with insects and rodents
- Contact with similar cases
- No history of coagulation disorder



NOTE: Acute Serum: ≤5 days from onset of symptoms, Convalescent serum > 5 days from onset of symptoms

NOTE: If primary or secondary testing cannot be performed at the national laboratory, specimens may be referred to CAREC

SYNDROMIC DIAGNOSIS FLOWCHART

FEVER AND NEUROLOGICAL SYMPTOMS

CASE DEFINITION

Fever (> 38.0°C or 100.4°F) with or without headache and vomiting with at least one of the following signs

- Meningeal irritation
- Convulsions
- Altered consciousness
- Altered sensory manifestations
- Paralysis (apart from AFP)

EPIDEMIOLOGICAL DATA

- Previously healthy person
- Risk factor for HIV
- Prior medication
- Recent travel
- Contact with insects & rodents
- Contact with similar cases

POSSIBLE DISEASES/PATHOGENS

Meningitis/Meningoencephalitis		
Viral	**Bacterial**	**Parasitic**
Enterovirus West Nile Adenovirus Herpes Mumps	Meningococcal meningitis Pneumococcal meningitis *Haemophillus influenzea* Leptospirosis	Malaria (*Plasmodium falciparum)* Trypanosomiasis

Encephalitis

Rabies

West Nile

St. Louis Encephalitis

Equine Encephalitis

Herpes

SPECIMENS

CSF, blood culture, blood smears, throat swab, urine, acute and convalescent serum

CSF, acute and convalescent serum, post mortem specimens

PRIMARY TESTING

Gram stain, bacterial culture

SECONDARY TESTING

Antigen detection. Viral culture. Serology. Genome amplification.

NOTE: Acute Serum: ≤5 days from onset of symptoms, Convalescent serum > 5 days from onset of symptoms

NOTE: If patient presents with AFP, follow the EPI programmeme protocol

NOTE: If primary or secondary testing cannot be performed at the national laboratory, specimens may be referred to CAREC

SYNDROMIC DIAGNOSIS FLOWCHART

FEVER AND RESPIRATORY SYMPTOMS

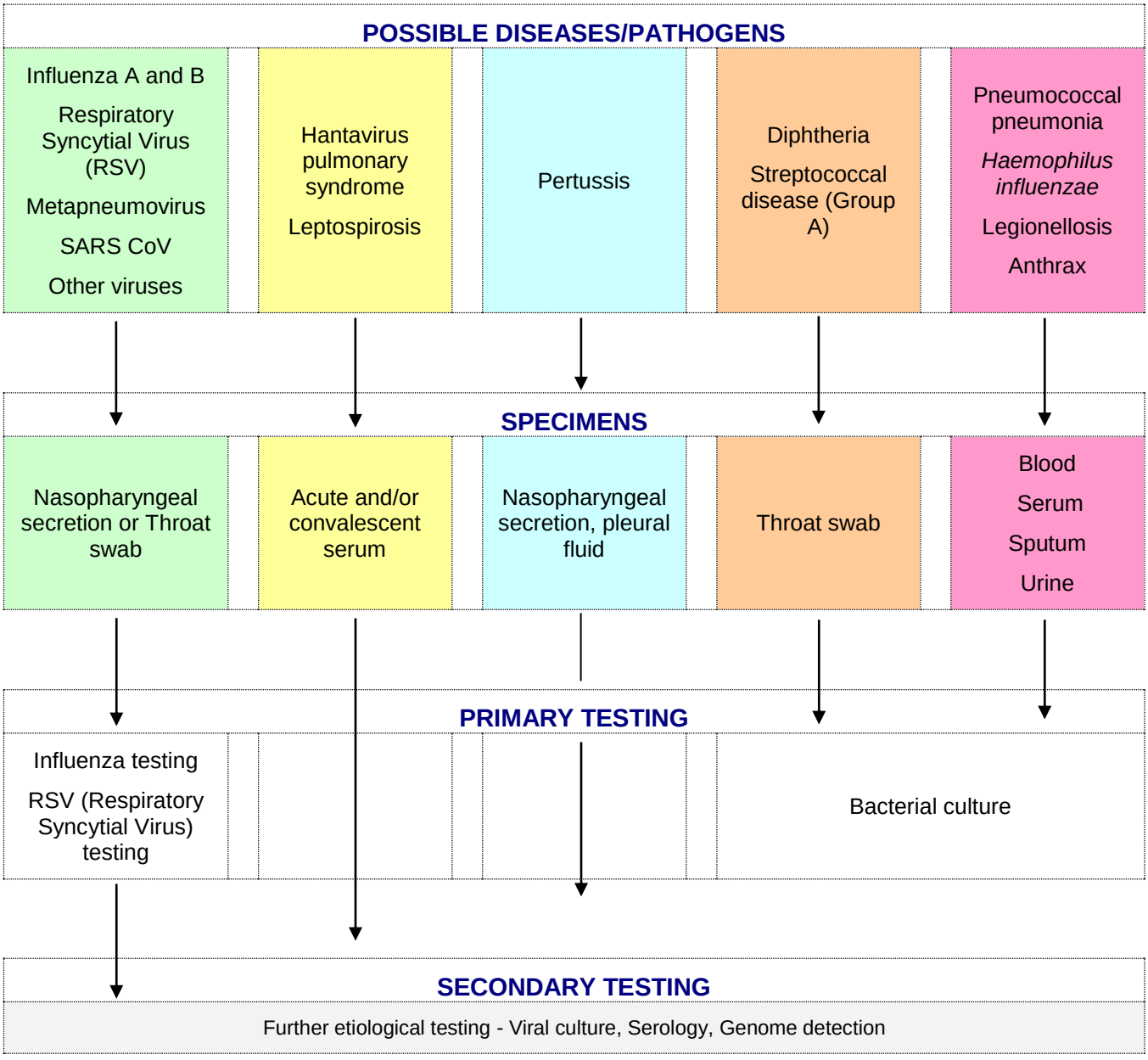
CASE DEFINITION

Fever (> 38.0°C or 100.4°F) with one of the following symptoms, with or without respiratory distress

- Cough
- Sore throat

EPIDEMIOLOGICAL DATA

- Previously healthy
- Risk factor for HIV
- Prior medication
- Recent travel
- Contact with animals
- Contact with similar cases



NOTE: Acute Serum: ≤5 days from onset of symptoms, Convalescent serum > 5 days from onset of symptoms

NOTE: If primary or secondary testing cannot be performed at the national laboratory, specimens may be referred to CAREC

SYNDROMIC DIAGNOSIS FLOWCHART

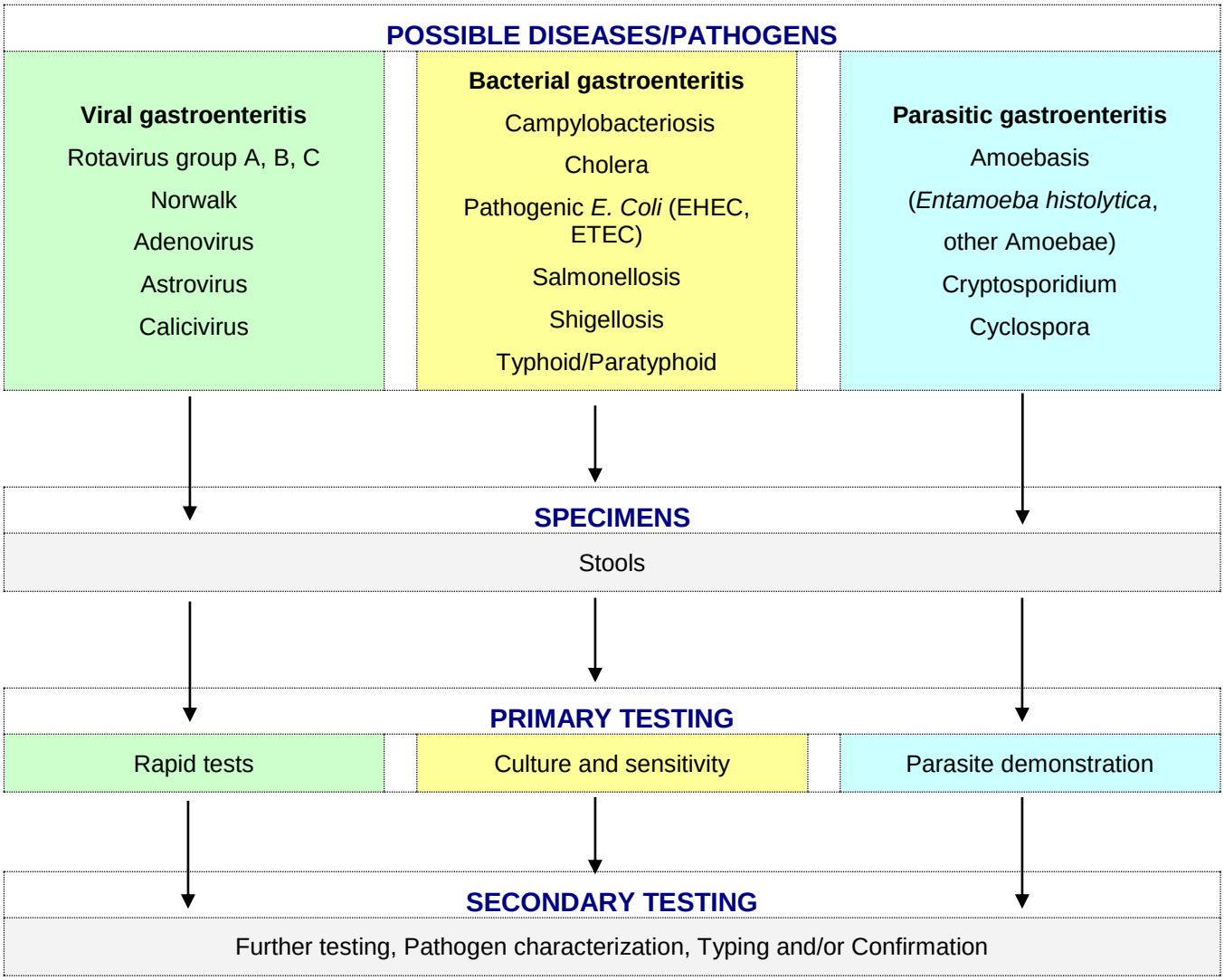
GASTROENTERITIS / ACUTE DIARRHOEA SYNDROME

CASE DEFINITION

Acute onset of diarrhoea, with or without fever, and presenting with 3 or more loose stools or watery stools in the past 24 hours, with or without dehydration, vomiting and/or visible blood

EPIDEMIOLOGICAL DATA

- Previously healthy person
- Risk factor for HIV
- Recent travel
- Food and water history
- Contact with similar cases



NOTE: Acute Serum: ≤5 days from onset of symptoms, Convalescent serum > 5 days from onset of symptoms

NOTE: If primary or secondary testing cannot be performed at the national laboratory, specimens may be referred to CAREC

SYNDROMIC DIAGNOSIS FLOWCHART

UNDIFFERENTIATED FEVER

CASE DEFINITION

Fever (> 38.0°C or 100.4°F) with two or more of the following symptoms

- Headache
- Retro-orbital pain
- Arthralgia
- Myalgia
- Nausea
- Vomiting

EPIDEMIOLOGICAL DATA

- Previously healthy person
- Recent travel
- Prior medication
- Contact with insects and rodents
- Contact with similar cases.

POSSIBLE DISEASES/PATHOGENS

Dengue Leptospirosis Viral hepatitis Other arboviral fevers Hantavirus	Brucellosis Typhoid/Paratyphoid Meningococcal infection	Malaria (*Plasmodium vivax)*

SPECIMENS

Acute and/or convalescent serum	Blood and serum	Blood smear, serum

PRIMARY TESTING

Serology	Blood culture, serology	Parasite demonstration, serology

SECONDARY TESTING

Viral isolation, Serology, Antigen detection, Genome detection		

NOTE: Acute Serum: ≤5 days from onset of symptoms, Convalescent serum > 5 days from onset of symptoms

NOTE: Measles and Rubella must be tested for if rash is present in children, as per the EPI Programme protocol

NOTE: If primary or secondary testing cannot be performed at the national laboratory, specimens may be referred to CAREC

OUTBREAK REPORTING FORM – PAGE 1 of 2

A. Reporting Details

1. Agency submitting report: .....
2. Country: .....
3. County/district/parish/region: .....
4. Name of person submitting report: .....
5. Contact telephone number: .....
6. Date this form was completed (dd/mm/yy): ..../..../....
7. Is this ☐ a first report or ☐ an updated/ammended report?

B. Type of Outbreak

8.
☐ Food-borne ☐ Respiratory
☐ Water-borne ☐ Sexually transmitted infection
☐ Vector-borne ☐ Unknown at this stage
☐ EPI disease ☐ Other, please specify below

9. Was a vehicle/vector/source identified? ☐ Yes ☐ No
10. If yes, please specify:

C. Descriptive Epidemiology (person, place)

11. Number of cases: ..... Suspected or Probable
..... Confirmed
..... Total

12. List number of cases (suspect, probable and confirmed) by age group and gender:

Age Group	Cases			
	Male	Female	Unknown	Total
< 1 year				
1 – 4 years				
5 – 14 years				
15 – 24 years				
25 – 44 years				
45 – 64 years				
65+ years				
Unknown				
Total				

13. Was the whole country affected? ☐ Yes ☐ No
14. If no, describe the areas affected: .....
.....
15. Exposure setting (check all that apply):
☐ General community
☐ Health institution (e.g. hospital, nursing home)
☐ Other institution (e.g. prison, boarding home)
☐ Hotel or resort complex
☐ Restaurant
☐ School or child care facility
☐ Other, please specify,
☐ Don't know

D. Clinical Details

16. Common Symptoms/Syndromes (check all that apply)

☐ Nausea ☐ Vomiting
☐ Diarrhea ☐ Abdominal cramps
☐ Fever ☐ Rash
☐ Respiratory symptoms ☐ Hemorrhagic symptoms
☐ Genital ulcer ☐ Genital discharge
☐ Neurological symptoms ☐ Headache
☐ Other, specify: .....
.....

17. Number of cases hospitalized: .....
(including cases that died)

18. Number of cases that died: .....
(*including cases hospitalized*)

19. Incubation period (circle appropriate units)
Average ..... hours / days
Range: ..... hours / days - ..... hours / days

20. Duration of illness (circle appropriate units)
Average: ..... hours / days
Range: ..... hours / days - ..... hours / days

E. Case Summary (time)

21. Please record number of cases per unit time. Record time interval as:
- Month (i.e. Jan 04, Feb 04, Mar 04), or
- Epidemiological week (i.e. 23, 24, 25), or
- Day (record as exact date, i.e. 23/06/04)

Time Interval	Number Suspect/ Probable Cases	Number of Confirmed Cases

F. Etiology

22. Was a primary causative pathogen identified in the outbreak? ☐ Yes ☐ No

23. If yes, please specify the name and subtype (if known) of the pathogen

G. Clinical Specimens (*e.g. stool, blood, urine, nasal aspirate, etc)

24. Type of Specimen	Number Tested	Number Positive	Etiologic Agent	Subtype 1	Subtype 2	Antimicrobial Resistance Profile

H. Food or Environmental Specimens (*e.g. ground beef, raw chicken, water, surface swab, etc)

25. Type of Specimen	Number Tested	Number Positive	Etiologic Agent	Subtype 1	Subtype 2	Antimicrobial Resistance Profile

I. Results of an epidemiological study

26. What type of epidemiological study was conducted?

☐ Cohort study ☐ Other, please specify .....

☐ Case Control Study ☐ No epidemiological study was conducted

27. If a cohort study was conducted, what was the overall attack rate? ..... %

(note, attack rate = [number ill/total persons at risk] x 100)

28. If a cohort or case control study was conducted, please complete the following table

Risk Factor	**Odds Ratio or Relative Risk**	**95% Confidence Intervals**	**p-value**

OUTBREAK REPORTING FORM – PAGE 3 of 3

J. Additional Outbreak Details/Notes

Please provide a brief summary of the outbreak, including information on the following if applicable and available:

- *Chain of events leading to outbreak*
- *Response measures taken*
- *Environmental Health Findings:*
  - *Trace-back investigation findings*
  - *Inspection/audit results of facility*
  - *Food handling practices/Sanitations findings*
  - *Water quality testing results*
  - *Aedes index*
- *Economic impact(e.g. financial, job losses, hotel or restaurant closures etc)*