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WHO/CDS/CSR/ISR/99.2

WHO Recommended Surveillance Standards. Second edition

This document has been produced jointly by technical programmes in WHO and by UNAIDS

World Health Organization

Department of Communicable Disease Surveillance and Response

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Acknowledgements

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Acronyms

9GPW:	WHO Ninth General Programme of Work, 1996-2001
AAFB:	Alcohol-acid-fast bacilli
Ab:	Antibody
AFP:	Acute flaccid paralysis
AFRO:	WHO Regional Office for the African Region
Ag:	Antigen
AIDS:	Acquired immunodeficiency syndrome
aLRTI:	Acute lower respiratory tract infections
AMRO:	see PAHO
ARI:	Acute respiratory tract infections
BSE:	Bovine spongiform encephalopathy
CATT:	Card agglutination trypanosomiasis test
CD4:	T4 lymphocyte population
CDC:	Centers for Disease Control and Prevention, Atlanta GA, USA
CJD:	Creutzfeldt-Jakob disease
CMFL	Community microfilarial load
CSF:	Cerebrospinal fluid
DA:	Direct agglutination test
DEC:	Diethylcarbamazine
DFA:	Direct fluorescent antibody
DHF:	Dengue haemorrhagic fever
DPT:	Diphtheria, pertussis, tetanus
DSS:	Dengue shock syndrome
DT:	Diphtheria, tetanus
EEG:	Electroencephalogram
EIA:	Enzyme immunoassay
ELISA:	Enzyme-linked immunosorbent assay
EMRO:	WHO Regional Office for the Eastern Mediterranean
EPIET:	European Programme for Intervention Epidemiology Training
EURO:	WHO Regional Office for the European Region
FAT:	Fluorescent antibody test
FETP:	Field Epidemiology Training Programme
FFI:	Fatal familial insomnia
FluNet:	Influenza network
FTA:	Fluorescent treponemal antibody-absorption
GIS	Geographic Information System
GPS:	Global Positioning System
GSS:	Gerstmann-Sträussler-Scheinker (syndrome)
HAV:	Hepatitis A virus
HBcAg	Hepatitis B core antigen
HbeAg:	Hepatitis B envelope antigen
HbsAg:	Hepatitis B surface antigen
HBV:	Hepatitis B virus
HCV:	Hepatitis C virus
HDV:	Hepatitis D virus
HepB3:	hepatitis B vaccine
HEV:	Hepatitis E virus
HI	Haemagglutination inhibition (test)
Hib.	Haemophilus influenzae type b
HIV:	Human immunodeficiency virus
HTP:	Hydroxytryptophane
IARC:	International Agency for Research in Cancer, WHO, Lyon, France
ICD-10:	International Classification of Diseases, 10th revision, WHO
ID:	Identification
IF:	Indirect Immunofluorescence
IFA:	Immunofluorescent assay

Acronyms *cont.*

IFAT:	Indirect immunoflourescent antibody test
IgG	Immunoglobulin G
IgM	Immunoglobulin M
IGO	Intergovernmental organization
IHR	International Health Regulations
IP	Immunoperoxidase
JE:	Japanese encephalitis
MAT:	Microscopic Agglutination Test
MDT:	Multidrug therapy
MNH:	Programme on Mental Health, WHO
MoH:	Ministry of Health
NGO:	Nongovernmental organization
NPEV:	Non-poliomyelitis enterovirus
nvCJD:	New variant Creutzfeldt-Jakob disease
OPV:	Oral poliomyelitis vaccine
PAB:	Protected at Birth
PAHO:	Pan-American Health Organization
PAS:	Periodic acid-Schiff (stain)
PCR:	Polymerase chain reaction
PrP:	Protease-prion protein
RPR:	Rapid Plasma Reagin
SEARO:	WHO Regional Office for South-East Asia
SRL:	Supra-national reference laboratory
STD:	Sexually transmitted diseases
Td:	Tetanus-diphtheria [toxoid]
TEPHINET:	Training in Epidemiology and Public Health Intervention Network
TPHA:	*Treponema pallidum* haemagglutination antibodies
TT:	Tetanus toxoid
UNAIDS:	Joint United Nations Programme on HIV/AIDS
VDRL:	Venereal Disease Research Laboratory
WHA:	World Health Assembly
WHO:	World Health Organization
WPRO:	WHO Regional Office for the Western Pacific

Introduction

This document has been produced jointly by technical clusters of WHO, as well as by UNAIDS, in order to bring together WHO recommended standards for the surveillance of communicable diseases. It is not meant to replace existing technical guidelines or be an exhaustive description of surveillance of all diseases. This document serves only as a guide to good practice and may help to harmonize [1]surveillance activities.

The purpose of this manual is to be a handy reference for key elements and contact information for all communicable diseases / syndromes associated with current WHO control programmes. It should be particularly useful at the Ministry of Health level in Member States, in approaching integrated surveillance of communicable diseases / syndromes.

The document is intended to be updated on a regular basis. This reflects the changing nature of infectious diseases and accompanying diagnostic and surveillance methods. It also reflects the multidisciplinary nature of disease surveillance in which many different programmes and partners are involved. The diseases and syndromes are organized in alphabetical order for easy reference. For each disease or syndrome there is a description of the rationale for surveillance, case definition, types of surveillance, minimum data elements, data analyses and principal uses of data for decision-making. In addition, the relevant WHO contact(s) are included with contact details. ICD-10 codes are provided for standardization of reporting and international data exchange.

A brief overview of the methods proposed for coordinating a national plan for communicable disease surveillance follows this introduction. Annex 1 provides information on surveillance-related software, and Annex 2 is a glossary of surveillance-related terms.

A first issue of the manual (November 1997) elicited many suggestions, for which we are grateful. This has led to some revision for practically every item in the present version, and the document is therefore reissued *in toto*. Major technical revisions concern AIDS and HIV, the new variant of Creutzfeldt-Jakob disease, and the vaccine-preventable diseases. The item on bacillary dysentery has been deleted because of overlap with the syndrome of bloody diarrhoea. Two new items have been added: *Haemophilus influenzae* type b disease and viral haemorrhagic fever syndromes.

[1] For further information, comments and suggestions, please contact either the relevant WHO Regional Office (contact information pages 18-23) or, at Headquarters in Geneva, Dr G. Rodier (rodierg@who.ch), Department of Communicable Disease Surveillance and Response, Tel: (4122) 791 2109; Fax: (4122) 791 4198; E-mail: Surveillancekit@who.ch

NATIONAL COORDINATION OF COMMUNICABLE DISEASE SURVEILLANCE

Effective communicable disease control relies on effective disease surveillance. A functional national communicable diseases surveillance system is essential for action on priority communicable diseases. It is a key part of public health decision-making in all countries (e.g. priority setting, planning, resource mobilization and allocation, prediction and early detection of epidemics, and monitoring and evaluation of disease prevention and control programmes).

There is an urgent need to build on current efforts to strengthen communicable disease surveillance at national level. Strong national systems will form the basis of an effective regional and global network for the surveillance and control of communicable diseases. The development and strengthening of national surveillance requires a substantial and long-term commitment of human and material resources, usually beginning with a systematic assessment of national surveillance activities. This should eventually lead to a national plan for the surveillance of communicable diseases.

What is the "national communicable disease surveillance system" ?

Many countries have developed surveillance activities for communicable diseases in order to monitor diseases with a high burden, detect outbreaks of epidemic-prone disease and monitor progress towards national or international control / eradication targets. In this sense, surveillance of communicable diseases is a national function; and the sum of all surveillance activities represents the "national communicable disease surveillance system". The various activities may be integrated into the broader Health Information System (HIS) or may be carried out independently. Surveillance activities have developed in an uneven way. Many activities are managed by different vertical diseases control programmes. In other cases the surveillance function is far removed from the control efforts: data are collected by central statistics offices on a large number of health events, many of which do not represent priorities for the country. In some situations, surveillance for particular health events has been developed by academic or research institutes which have very specific information needs.

Establishing surveillance activities within vertical programmes allows the surveillance function to remain close to the control function. On the other hand, the overall surveillance function in a country can become badly disjointed and inefficient with field workers participating in multiple complicated systems, using different surveillance methods, terminology, and reporting forms and schedules. This entails extra costs and training requirements and often leads to work overload and lack of motivation among health workers. In many cases, huge amounts of data may be collected by central bodies with little of no analysis of that data or use of the information that they provide. The surveillance system becomes driven by the need to collect and move data, little attention being given to the use of information by each level of the health service for decision-making.

What is meant by a "multi-disease approach to surveillance" ?

A multi-disease approach to communicable disease surveillance involves looking at all surveillance activities in a Member State as a common public service. These activities involve similar functions and very often use the same structures, processes and personnel. Disease surveillance should be based on collecting only the information that is required to achieve the control objectives. The data required may differ from disease to disease. Specialized surveillance systems are important, especially where surveillance is complex and has specific information needs. Eradication and elimination programmes may require a very active surveillance

programme aimed at detecting every case. In other situations, information on outcome may be important. For example, the rate of treatment completion and the cure rate are essential indicators in TB surveillance. Other diseases may require more than one source of data for good decision-making. For example, in HIV/AIDS surveillance the proportion of the population positive for HIV must be monitored as well as the number of new cases of AIDS. This requires special HIV seroprevalence surveillance usually done in a few representative sites ("sentinel surveillance"). Despite the variety of information needs, many elements of data collected in surveillance are very similar and the data source is often the same individual or facility.

There may however, be differences in:

- the specific case detection method used (active case detection *vs* passive)
- the speed at which data need to flow through the system (immediate *vs* routine)
- the rapidity of response required (immediate investigation of cases or clusters of
- cases *vs* analysis of data on a regular basis with subsequent adjustments to a control programme)

For the system to function as an “early warning system”, reporting, confirmation, decision-making and response must be rapid. On the other hand, for more endemic diseases, the aim may be to carefully consider data collected in order to adjust or target the control programme. The national surveillance system should therefore be able to accommodate both needs, and will require two-speed reporting mechanisms.

All surveillance systems involve similar functions. It is possible to look at the system as a whole and approach development and strengthening in a coordinated way. The challenge is to identify where synergy between systems is possible, and identify opportunities for coordination or integration of activities, while at the same time recognising the special needs of some programmes for supplementary information or alternative methods of surveillance.

The core functions in surveillance of any health event are:

- case detection
- reporting
- investigation and confirmation
- analysis and interpretation
- action
    - control/response
    - policy
    - feedback

These functions are made possible by support functions that improve core surveillance functions:

- setting of standards (e.g. case definitions)
- training and supervision
- setting up laboratory support
- setting up communications
- resource management

The level of coordination/integration in the national surveillance system can affect:

- performance of the system
- cost of the system
- sustainability of the system

Setting Priorities

One of the important components of the national surveillance plan is a list of priority diseases for surveillance. This list, as short as possible, should be established with the close participation of national health authorities. The rational for prioritizing diseases could use the following series of questions. These questions should be addressed not only from the national perspective but also from a regional, and possibly international, viewpoint as diseases may spread rapidly across national boundaries:

- Does the disease result in a high disease impact? (morbidity, disability, mortality)?
- Does it have a significant epidemic potential? (e.g. cholera, meningitis, measles..)
- Is it a specific target of a national, regional or international control programme? (e.g. the 9th Global Programme of Work (9GPW) disease target, disease targeted for surveillance by a WHO Regional Plan, notifiable disease according to WHO *International Health Regulations*, WHO international or regional control programme)
- Will the information to be collected lead to significant public health action?

  (e.g. immunization campaign, other specific control measures to be provided by the central level, international reporting).

In addition to specific diseases, specific syndromes (e.g. haemorrhagic fever syndrome) should be considered for surveillance as well as some specific public health issues (e.g. antibiotic sensitivity of some infectious agents). Following, or possibly preceding, the list of priority diseases, an inventory of existing surveillance activities should be carried out. This should be based on thorough site visits and a review of all key components of the health system, including public and private sectors where appropriate, as well as nongovernmental organizations involved in long term health activities in the country. The following elements should be addressed for each disease or syndrome under surveillance:

- is the case definition:
  - clear?
  - appropriate?
  - consistent throughout the surveillance system?
- is the reporting mechanism:
  - clear?
  - efficient?
  - of appropriate reporting periodicity?
  - available to all relevant persons and institutions?
- is the analysis of data:
  - appropriate?
  - susceptible to proper presentation?
  - used for decision-making?
- do the personnel involved:
  - have a good understanding of the value of the surveillance system?
  - understand, show interest in, and support, their own surveillance task?
  - have enough appropriate human and material resources?

- do the personnel involved receive appropriate:
  - training?
  - supervision?
- is the feed-back from intermediate and central levels:
  - appropriate?
  - sufficient?
  - motivating?

When the assessment of current activities is done, the next question is:

- Is there an operational control programme for each of the priority diseases?

Current surveillance activities must be reviewed against what is needed and any gaps identified. Some diseases or syndromes may already be subject to routine surveillance (i.e. the periodic reporting of data on cases of selected diseases) or there may be a requirement to report the disease or syndrome immediately on suspicion or diagnosis. This is especially true for diseases that may lead to epidemics. However, certain diseases may have alternative or supplementary surveillance methods such as laboratory-based or sentinel surveillance. The emphasis should be on a minimum set of data to be collected, analysed and acted upon at each level of the system. Only that information that aids public health decision-making should be collected.

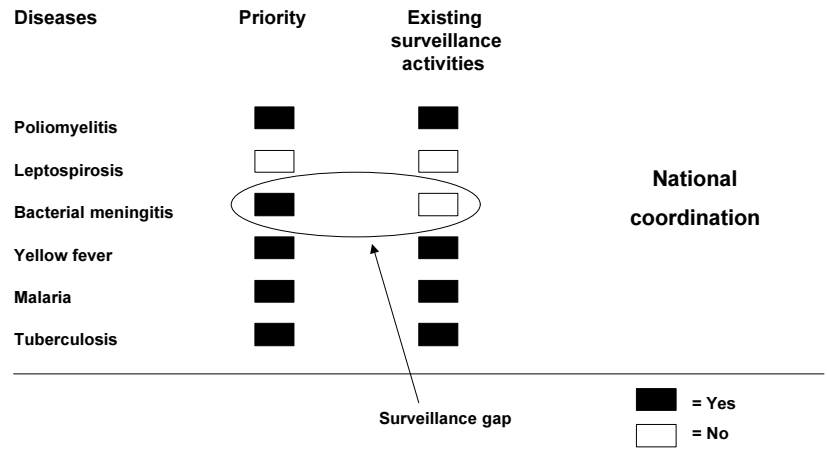
Once priority diseases have been selected and the gaps identified, a plan of action for surveillance should be developed. An integrated approach which aims to coordinate and streamline all surveillance activities is advised. To this end a central body, which may be based in the Ministry of Health, should coordinate all the surveillance activities.

The key decisions in development of surveillance are those relating to case definitions and surveillance methods. Compromises may have to be made on the choice of surveillance method and the minimum data elements in order to ensure an integrated approach. In this document, case definitions are tailored for the purposes of epidemiological surveillance with the inclusion in many cases of “suspected” or “clinical” case definitions. There is some overlap between syndromes and diseases. In some situations a syndromic approach is appropriate whereas in others a disease specific approach is preferable. In fact it is likely that countries may use a syndromic approach at the peripheral levels but a more specific diagnosis should be used in the investigation and confirmation of outbreaks. In all cases, terminology should be clear and agreed upon by all partners in the surveillance activities.

Surveillance priorities should be appropriate to the disease epidemiology, infrastructure and resources in each country. National surveillance systems should reflect global goals for communicable disease control as stated in the WHO 9th Global Programme of Work (9GPW) and be in line with regional surveillance plans defined by WHO Regional Offices. It is essential that feedback loops be built into the system. This may be a regular epidemiological bulletin with tables and graphs showing trends, progress towards targets and reports on the investigation and control of outbreaks. It is crucial that the personnel involved in surveillance activities be trained for their surveillance tasks, and there is also a need for ongoing in-service training at all levels, e.g., through workshops followed by close supervision in the field. This could be best accomplished in close collaboration with WHO’s Regional Offices and possibly, by setting up a national training programme in field epidemiology (e.g. EPIET, FETP).

Fig. 1 shows a case where Leptospirosis is not perceived as a priority and is not subject to surveillance activities. However, bacterial meningitis, which is perceived as a priority disease, is not subject to surveillance activities- and this should be remedied.

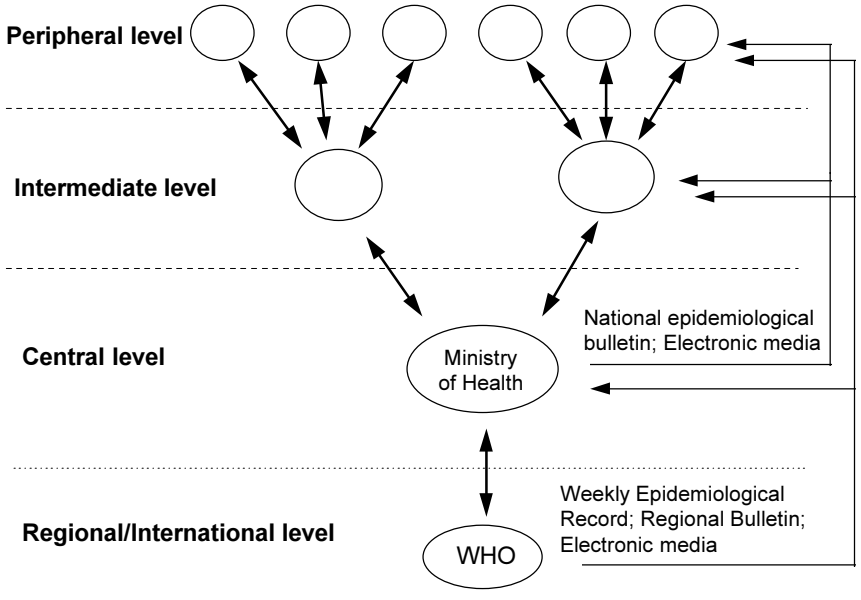
Figure 1: Sample Gap Analysis in National Surveillance Assessment



Explanatory notes

This document attempts to identify the key activities and tasks associated with the surveillance of a range of communicable diseases. To avoid confusion, administrative level names (e.g. “district”, “province”) are not used. Instead, an attempt has been made to break down the surveillance activities into functional levels, concentrating on the various activities that would usually be carried out at each level (i.e. peripheral, intermediate, central). It is important to note that this represents only a prototype that would have to be adapted to reflect the structure and level of sophistication of existing health services. No matter what structure is decided upon, each level must have adequate resources and receive appropriate training.

Figure 2: Schema for information flow in Communicable Disease Surveillance



The peripheral level: first point of contact of an ill person with the health services. The patient is usually seen by a primary care physician, clinical officer or nurse. It is normally at this level that the first opportunity for epidemiological surveillance occurs. However, it must be remembered that surveillance is only one of many tasks. The staff at this level are unlikely to have epidemiological training and may in fact see the recording and reporting of information on cases as administrative and unimportant. The situation is made worse by case definitions that are confusing and difficult to apply and by having an excessive number of reportable diseases. In order to be successful, the collection of information must be simple and useful locally. To this end a limited number of easily recognizable diseases or syndromes should be decided upon. These should not normally involve extensive confirmatory procedures (unless these procedures are essential) and the principle should be the reporting to intermediate level of suspected rather than confirmed disease. The method of recording should be in harmony with clinical record keeping practices and not duplicate them. It is desirable that the personnel have the opportunity and the ability to chart and tabulate their own data in order to monitor local trends. In addition the immediate reporting of a disease with epidemic potential should be followed by an equally immediate response.

Tasks at the peripheral level:

- diagnosis and case management
- reporting of cases
- simple tabulation and graphing of data

Certain conditions may be subject to *community-based surveillance*. Community-based surveillance in this context means the detection and reporting of diseases from within the community usually by local people or leaders who have received basic instruction on how to recognize certain conditions. The decision to base surveillance in the community must be based on a clearly identified needs and advantages over health care unit-based surveillance. *The role of nongovernmental organizations (NGOs)* working in the field, including missions' health facilities, as well as the role of the private sector, have become increasingly important in disease surveillance. These partners must be considered in the national surveillance plan where possible.

The intermediate level, at which data are collected from the peripheral level. Its main function from the perspective of communicable disease surveillance and control is ongoing analysis of data from the periphery in order to recognize outbreaks or changes in disease trends. These analyses must be associated with responses such as investigation and intervention. Effectiveness of interventions can be monitored using the same data sources.

Countries may have two intermediate levels (e.g. district and region). This will depend on the size of the country and the structure and level of development of the health service. In many cases the professional at this level will have other tasks in the area of programme management. The tasks must be manageable and the surveillance data be perceived as immediately useful. In some cases it may be more appropriate that the task of outbreak investigation be undertaken from the central level.

Tasks at the intermediate level:

- case management which can not be done at the peripheral level
- analysis of data from the peripheral level for:
  - epidemiological links
  - trends
  - achievement of control targets
- provision of supportive laboratory data (or laboratory diagnosis if possible)

- investigation of suspected outbreaks
- feedback of information to the peripheral level
- reporting of data and suspected/confirmed outbreaks to central level

The central level is usually at the national level where policies on infectious disease are set and where resource allocation most often occurs. The central level in some large countries may actually be at a federal level. The central level plays a key role in supporting the intermediate levels, by providing services that are not available elsewhere, such as high level epidemiological skills or laboratory facilities. The central level must also be able to deal with outbreaks of national importance in a coordinated fashion. In addition, overall disease trends can be analysed and resources for disease control targeted to high-risk areas. The central level must liaise with other countries and international agencies in the response to outbreaks of international significance and in the management of diseases subject to the *International Health Regulations*, or to agreed targets for control or elimination. The central level may have access to alternative data sources such as national reference laboratories where the identification of unusual organisms should trigger a response.

Tasks at the central level:

- overall support to, and coordination of, national surveillance activities
- provision of laboratory diagnosis data if not available at intermediate level (use regional or international reference laboratories if required)
- analysis of data from intermediate level for:
  - epidemiological links
  - trends
  - achievement of control targets
- support to intermediate level for outbreak control
  - case management
  - laboratory
  - epidemiology
  - education
  - logistics
- feedback to intermediate level, and possibly to the peripheral level
- report to WHO, as required (*International Health Regulations*, specific needs of control programmes)

Collaboration with non-medical sectors such as agriculture, veterinary medicine, and environment must be considered where appropriate (e.g. water or foodborne diseases, vector-borne diseases, human zoonoses).

Zero Reporting: Whatever the structure of the surveillance system, data on priority diseases or syndromes should move smoothly through the system triggering the appropriate responses throughout. The system should include zero reporting: each site should report for each reporting period even if that means reporting zero cases. This avoids the confusion of equating “no report” with “no cases”. In addition the surveillance system must include performance indicators for reporting (e.g. completeness and timeliness of reports).

Feedback: It is essential that feedback loops be built into the system. This may be through regular epidemiological bulletins with tables and graphs showing trends and progress towards targets and reports on the investigation and control of outbreaks.

Sample Format — Cholera

A00 — *Cholera*

ICD code
Disease name
Rationale for surveillance

RATIONALE FOR SURVEILLANCE

Cholera causes an estimated 120 000 deaths per year and is prevalent in 80 countries. The world is currently experiencing the 7th pandemic. In Africa epidemics have become more frequent and case-fatality rates are high. Refugee or displaced populations are at major risk of epidemics due to the conditions prevailing in the camps (unsafe water, poor sanitation and hygiene). Control of the disease requires appropriate surveillance with universal case reporting. Health education of the population at risk and improvement of living conditions are essential preventive measures. Case reporting universally required by *International Health Regulations.*

Recommended case definition

RECOMMENDED CASE DEFINITION

Clinical case definition

- *In an area where the disease is not known to be present*, severe dehydration or death in a patient aged 5 years or more **or**
- *In an area where there is a cholera epidemic*, acute watery diarrhoea, with or without vomiting, in a patient aged 5 years or more*

Laboratory criteria for diagnosis

Isolation of *Vibrio cholerae* O1 or O139 from stools in any patient with diarrhoea

Case classification

Suspected: *A* case that meets the clinical case definition

Probable: Not applicable

Confirmed: A suspected case that is laboratory-confirmed

Note: in a cholera-threatened area, when the number of "confirmed" cases rises, shift should be made to using primarily the "suspected case" classification,

*Cholera does appear in children under 5 years; however , the inclusion of all cases of acute watery diarrhoea in the 2-4 year age group in the reporting of cholera greatly reduces the specificity of reporting. For management of cases of acute watery diarrhoea in an area where there is a cholera epidemic, cholera should be suspected in all patients.

Recommended types of surveillance

RECOMMENDED TYPES OF SURVEILLANCE

Routine surveillance (This may be integrated with surveillance of diarrhoeal diseases, see acute watery diarrhoea).

Immediate case-based reporting of suspected cases from periphery to intermediate level and central level. All suspected cases and clusters should be investigated.

Aggregated data on cases should also be included in routine weekly/monthly reports from peripheral to intermediate and central level.

International: *Initial* suspected cases should be reported to WHO (mandatory)

Aggregated data on cases should be reported to WHO (mandatory)

Outbreak situations:

- During outbreak situation surveillance should be intensified with the introduction of active case finding
- Laboratory confirmation should be performed as soon as possible

Thereafter weekly reports of cases, ages, deaths, regions, and hospital admissions to be set up

Recommended minimum data elements

RECOMMENDED MINIMUM DATA ELEMENTS

Case-based data for investigation and reporting

Age, sex, geographical information

Hospitalization (Y/N)

Outcome

Aggregated data for reporting

Number of cases by age, sex

Number of deaths

Recommended data analyses, presentation, reports

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Use weekly numbers, not moving averages

Case-fatality rates (graphs)

Weekly/monthly plots by geographical area (district) and age group (GIS) (graphs)

Comparisons with same period in previous five years

Principal uses of data for decision-making

PRINCIPAL USES OF DATA FOR DECISION-MAKING

Detect outbreak, estimate the incidence and case-fatality rate

Undertake appropriately timed investigations

Assess the spread and progress of the disease

Plan for treatment supplies prevention and control measures

Determine the effectiveness of control measures

Special aspects

SPECIAL ASPECTS

At least one reference laboratory in each country is recommended for species identification.

Once the presence of cholera in an area has been confirmed , it becomes unnecessary to confirm all subsequent cases.; shift should be made to using primarily the "suspected" case classification.

Monitoring an epidemic should, however, include laboratory confirmation of a small proportion of cases on a continuing basis

For countries where cholera is rare or previously unrecognized, the first cases should be confirmed by laboratory diagnosis (including demonstration of toxigenic *Vibrio choleraeO*1 or O139 in faeces if possible) .

Contact information

CONTACT INFORMATION

Regional offices

See Regional Communicable Disease contacts on pages 18-23

Headquarters, 20 Avenue Appia, CH-1211 Geneva 27,

Communicable Diseases Surveillance and Response(CSR) Switzerland

E-mail: tikhomirov@who.ch / outbreak@who.ch

Tel: (41 22) 791 2688 / 2662 /2111 Fax: (41 22) 791 4893 / 0746 attn CSR

SURVEILLANCE ACTIVITIES: CRITERIA AND WHO DEPARTMENT

SELECTION CRITERIA	LOCATION	CONTACT
Targeted for eradication (9GPW 6.1)		
- **dracunculiasis**	DRA/CEE	N. Zagara
- **poliomyelitis**	HTP/VAB	B. Aylward
Targeted for elimination (9GPW 6.2)		
- **American trypanosomiasis/Chagas disease**	TDR/TDF	A. Moncayo
- **leprosy**	CDS/CEE	D. Daumerie
- **lymphatic filariasis**	CDS/CEE	E. Ottesen
- **measles**	HTP/VAB	A. Henao-Restrepo
- **neonatal tetanus**	HTP/VAB	M. Neill
Targeted for reduced incidence/prevalence (9GPW 6.3)		
- **hepatitis B**	HTP/VAB	J. Wenger
- **malaria**	CDS/CPC	A. RIetveld
- **tuberculosis**	CDS/CPC	M. Raviglione
Targeted for reduced transmission (9GPW 6.4)		
- **AIDS/HIV**	CDS/CSR	S. Lazzari
	UNAIDS	B. Schwartlander
Diseases submitted to International Health Regulations		
- **cholera**	CDS/CSR	E. Tikhomirov
- **plague**	CDS/CSR	E. Tikhomirov
- **yellow fever**	CDS/CSR	R. Arthur
Other international surveillance/control programmes		
- **African trypanosomiasis**	CDS/CSR	J. Jannin
- **anthrax**	CDS/CSR	O. Cosivi
- **brucellosis**	CDS/CSR	O. Cosivi
- **CJD & variants**	CDS/CSR	F. Meslin
	CIP/RPC	C. Bolis
- **dengue**	CDS/CSR	R. Arthur
	CDS/CTD	M. Nathan
- **diphtheria**	HTP/VAB	J. Wenger
- **endemic dysentery**	CDS/CSR	M. Neira
- ***Haemophilus influenzae* type b disease**	HTP/VAB	J. Wenger
- **hepatitis C**	CDS/CSR	D. Lavanchy
- **influenza**	CDS/CSR	D. Lavanchy
- ***leishmania*/HIV co-infections**	CDS/CSR	P. Desjeux
- **leishmaniasis**	CDS/CSR	P. Desjeux
- **leptospirosis**	CDS/CSR	O. Cosivi

- **meningococcal meningitis** (CSM)	CDS/CSR	E. Tikhomirov
- **onchocerciasis**	AFRO/OCP	A. Daribi
- **pertussis (whooping cough)**	HTP/VAB	P. Duclos
- **rabies**	CDS/CSR	F. Meslin
- **salmonellosis (animal)**	CDS/CSR	K. Stöhr
(foodborne)	SDE/PHE	Y. Motarjemi
- **schistosomiasis & intestinal parasites**	CDS/CPC	L. Savioli

Surveillance by syndrome or transmission route

- **acute respiratory infections**	CHS/CAH	D. Robinson
- **antimicrobial resistance**	CDS/CSR	E. Tikhomirov
- **anti-tuberculosis drug resistance**	CDS/CSR	M. Espinal
- **diarrhoeal diseases**	CHS/CAH	J. Bryce
- **foodborne diseases**	SDE/PHE	Y. Motarjemi
	CDS/CSR	K. Stöhr
- **sexually transmitted disease syndromes**	CHS/SHI	A. Gerbase
- **viral haemorrhagic fevers**	CDS/CSR	R. Arthur
- **zoonoses not otherwise specified**	CDS/CSR	F. Meslin

Related global surveillance activities

- **cancer registry**	IARC*	D. Parkin
- **health and demographic data, causes of death, life tables, mortality trends**	EIP/GPE	O. Frank

* International Agency for Research on Cancer, Lyon, France

Regional surveillance	AFRO	P. Lusamba
	EMRO	B. Sadrizadeh
	EURO	S. Litvinov
	PAHO	S. Corber
	SEARO	V. Kumar
	WPRO	R. Muto

COMMUNICABLE DISEASE CONTACTS IN REGIONAL OFFICES

1. WHO REGIONAL OFFICE FOR AFRICA (AFRO) *Member States*

Algeria	Eritrea	Namibia
Angola	Ethiopia	Niger
Benin	Gabon	Nigeria
Botswana	Gambia	Rwanda
Burkina Faso	Ghana	Sao Tome and Principe
Burundi	Guinea	Senegal
Cameroon	Guinea-Bissau	Seychelles
Cape Verde	Kenya	Sierra Leone
Central African Republic	Lesotho	South Africa
Chad	Liberia	Swaziland
Comoros	Madagascar	Togo
Congo	Malawi	Uganda
Côte d'Ivoire	Mali	United Republic of
Democratic Republic of the Congo	Mauritania	Tanzania
Equatorial Guinea	Mauritius	Zambia
	Mozambique	Zimbabwe

Contacts

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E-mail: ADIKPETOE@WHO.ORG
LUSAMBAP@WHOAFR.ORG
SAMBAE@HTSD.COM at INET
ALEMUW@WHOAFR.ORG
Following the temporary closure of the AFRO office in Brazzaville, a temporary office has been set up in Harare
Tel: 263 4 706 951/707 493 Fax: 263 4 705 619/702 044
If you experience difficulties in communicating with AFRO on disease surveillance issues, please contact WHO, Geneva, Tel: 41 22 791 21 11 / 24142 / 2314;
E-mail: Surveillancekit@who.ch

Summary, AFRO Regional Plan for communicable disease surveillance

The main communicable diseases in the Region can be classified as follows:
targeted for eradication: dracunculiasis, poliomyelitis
targeted for elimination: leprosy, neonatal tetanus
epidemic-prone: bacillary dysentery, cholera, measles, meningococcal meningitis, plague, viral haemorrhagic fevers, yellow fever.
Other diseases of public health importance: diarrhoea (<5yr), HIV/AIDS, STIs malaria, pneumonia, sexually transmitted diseases, trypanosomiasis, tuberculosis, onchocerciasis.

Resolution AFR/RC48/R2 of the Regional Committee recommends that Member States

1. *Assess their surveillance systems for communicable diseases.*
2. *Assess the laboratory component of disease control programmes*, including drug resistance.
3. Take the necessary measures, including resource allocation, to *implement an integrated regional strategy for disease surveillance.*
4. *Effectively participate in intercountry cooperation activities.*
5. Make effective use of epidemiological data in *decision-making, priority setting and resource allocation.*

2. WHO REGIONAL OFFICE FOR THE AMERICAS (AMRO, PAHO)

Member States

Antigua and Barbuda	Cuba	Panama
Anguilla	Dominica	Paraguay
Argentina	Dominican Republic	Peru
Aruba	Ecuador	Puerto Rico*
Bahamas	El Salvador	Saint Kitts and Nevis
Barbados	Grenada	Saint Lucia
Belize	Guatemala	Saint Vincent and the Grenadines
Bolivia	Guyana	
Brazil	Haiti	Suriname
Canada	Honduras	Trinidad and Tobago
Cayman Islands, Chile	Jamaica	Turks and Caicos Islands
Colombia	Mexico	United States of America
Costa Rica	Montserrat	Uruguay
	Nicaragua	Venezuela

* Associate Member

France	(French Guiana, Guadeloupe, Martinique)
Netherlands	(Netherlands Antilles)
United Kingdom	(British Virgin Islands)

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Summary, AMRO/PAHO Regional Plan for communicable disease surveillance:

1. *Strengthen regional surveillance networks for infectious diseases in the Americas.* Surveillance networks are closely linked with reference diagnostic support and function as early warning systems. An integrated electronic platform will capture and disseminate via the Internet information on the occurrence of selected infectious diseases and identified outbreaks.
2. *Establish national and regional infrastructures for early warning and rapid response to infectious disease threats* through laboratory enhancement and multidisciplinary training programs.
3. *Promote the further development of applied research in the areas of rapid diagnosis, epidemiology, and prevention.* In addition to Region-wide emerging infectious threats such as cholera, tuberculosis, and HIV, disease-specific research priorities should be developed on a country-by-country basis.
4. *Strengthen regional capacity for implementation of prevention and control strategies* (action and feedback components of the Regional Plan of Action).

3. WHO REGIONAL OFFICE FOR THE EASTERN MEDITERRANEAN (EMRO) *Member States*

Afghanistan	Jordan	Saudi Arabia
Bahrain	Kuwait	Somalia
Cyprus	Lebanon	Sudan
Djibouti	Libyan Arab Jamahiriya	Syrian Arab Republic
Egypt	Morocco	Tunisia
Iran (Islamic Republic of)	Oman	United Arab Emirates
Iraq	Pakistan	Yemen
	Qatar	

Plus: Palestine self-ruled area

Contacts

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Summary, EMRO Regional Plan for communicable disease surveillance:

1. *Develop a list of priority diseases for surveillance.*
2. *Develop guidelines for surveillance.*
3. *Develop national epidemic management systems.*
4. *Develop an efficient public information system.*
5. *Identify Regional collaborating centres and strengthen their role.*
6. *Develop a Regional rapid response system.*
7. *Strengthen communication channels between WHO and Member States.*

4. WHO REGIONAL OFFICE FOR EUROPE (EURO) *Member States*

Albania	Greece	Republic of Moldova
Andorra	Hungary	Romania
Armenia	Iceland	Russian Federation
Austria	Ireland	San Marino
Azerbaijan	Israel	Slovakia
Belarus	Italy	Slovenia
Belgium	Kazakhstan	Spain
Bosnia and Herzegovina	Kyrgyzstan	Sweden
Bulgaria	Latvia	Switzerland
Croatia	Lithuania	Tajikistan
Czech Republic	Luxembourg	The Former Yugoslav Republic
Denmark	Malta	of Macedonia
Estonia	Monaco	Turkey
Finland	Netherlands	Turkmenistan
France	Norway	Ukraine
Georgia	Poland	United Kingdom
Germany	Portugal	Uzbekistan
		Yugoslavia

Contacts

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E-mail: mci@who.dk

Summary, EURO Regional Plan for communicable disease surveillance

The work of WHO/EURO's Communicable Disease and Immunization Programme focuses on the major regional public health problems in this area: HIV/AIDS, tuberculosis, and diseases preventable by immunization (including the eradication of poliomyelitis). Following political and socio-economic changes in eastern Europe, many communicable disease problems have emerged or re-emerged. These include:

- epidemic diphtheria and syphilis
- HIV among injectable drug users and other groups at higher risk
- a dramatic increase in tuberculosis morbidity and mortality
- the increasing occurrence of bacteria resistant to antibiotic treatment
- the re-emergence of malaria in countries bordering EMRO and SEARO
- outbreaks and epidemics of food- and water-borne diarrhoeal diseases

These make the programmes for surveillance and control of communicable diseases in the eastern part of the Region a priority. The plan of work for the biennium has been approved by the Regional Committee.

5. WHO REGIONAL OFFICE FOR SOUTH-EAST ASIA (SEARO)

Member States

Bangladesh	India	Nepal
Bhutan	Indonesia	Sri Lanka
Democratic People's Republic of Korea	Maldives	Thailand
	Myanmar	

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Should you experience difficulties in reaching the above, call Fax 91 11 332 7972

Summary, SEARO Regional Plan for communicable disease surveillance

The region has adopted an integrated approach to combat communicable diseases of public health importance. The regional priorities include:

The eradication or elimination of diseases such as dracunculiasis (India), leprosy and poliomyelitis in the Region.

Reducing the burden of malaria and tuberculosis

Intensifying the prevention and control efforts for communicable diseases that are major public health problems in the Region, through the establishment of appropriate national and regional surveillance mechanisms.

Strengthening of surveillance and monitoring of priority communicable diseases with a potential to spread rapidly and organising an effective response to these disease outbreaks/epidemics through planning, monitoring and evaluation of control programmes.

The following are regional strategies for the coming years towards the prevention and control of communicable diseases:

1. *Strengthen epidemiological surveillance.*
2. *Strengthen laboratory capabilities and services.*
3. *Establish rapid response mechanisms.*
4. *Monitor antimicrobial resistance.*
5. *Establish international disease surveillance networking.*
6. *Ensure advocacy and mobilization of international support.*

6. WHO REGIONAL OFFICE FOR THE WESTERN PACIFIC (WPRO)

Member States

Australia	Malaysia	Republic of Korea
Brunei Darussalam	Marshall Islands	Samoa
Cambodia	Micronesia (Federated States of)	Singapore
China	Mongolia	Solomon Islands
Cook Islands	Nauru	Tokelau*
Fiji	New Zealand	Tonga
Japan	Niue	Tuvalu
Kiribati	Palau	Vanuatu
Lao People's Democratic Republic	Papua New Guinea	Viet Nam
	Philippines	

*Associate Member

France	(French Polynesia, New Caledonia, Wallis and Futuna Islands)
Portugal	(Macao)
United Kingdom	(Pitcairn Island)
United States of America	(American Samoa, Guam, Commonwealth of the Northern Mariana Islands)

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Summary, WPRO Regional Plan for communicable disease surveillance

Measles surveillance
Poliomyelitis surveillance
Surveillance on antimicrobial resistance
STD/AIDS surveillance, including gonococcal infections
Surveillance on anti-malaria and anti-tuberculosis drug resistance
Influenza surveillance in China (human and animal strains)
For other selected infectious diseases, annual or monthly report of cases to WPRO.

WPRO is also developing Creutzfeldt-Jacob disease (CJD) surveillance mechanisms as part of global CJD surveillance (although CJD has not been reported from the Region).

B20-B21-B22-B23-B24 AIDS

(Acquired Immuno-Deficiency Syndrome)

RATIONALE FOR SURVEILLANCE

AIDS is a disease targeted for reduced incidence, prevalence and transmission (9GPW, target 6.3). Control measures are based on prevention and care strategies. Surveillance is necessary to assess national needs in education, supplies, and health care and to anticipate spread in the community. Surveillance will provide epidemiological data used for national prevention and care plan and will be essential to evaluate the impact of control activities.

RECOMMENDED CASE DEFINITIONS

Different case definitions are used in different countries, depending on population factors (children, adults, relative occurrence of opportunistic infections) and on the laboratory infrastructure and training available. Current case definitions include:

(1) CDC 1987
(2) CDC/CD4
(3) European
(4) WHO for surveillance (formerly Bangui/WHO/clinical)
(5) Expanded WHO for surveillance (formerly Abidjan)
(6) Caracas/PAHO & revised Caracas/PAHO

(1-3: for sophisticated laboratory facilities) (4-6: for limited laboratory facilities)

1. Revision of the CDC surveillance case definition for the Acquired Immune Deficiency Syndrome. *Morbidity and Mortality Weekly Record*, August 14, 1987, **36** (suppl.): 1S-15S.
2. Case definitions for infectious conditions under public health surveillance. *Morbidity and Mortality Weekly Record*, May 2, 1987, **36** (RR-10): 5-6.
3. ANCELLE-PARK R. Expanded European AIDS case definition. *Lancet*, 1993; **341**: 441.
   AIDS Surveillance in Europe, Quarterly Report, 1993 (37).
4. BUEHLER JW, DE COCK K, BRUNET J-B. Surveillance definitions for AIDS. *AIDS* 1993, **7**(suppl. 1): S73-S81.
   WHO case definitions for AIDS surveillance in adults and adolescents. *Weekly Epidemiological Record*, 1994, **69**(37*)*: 273-275.
5. Grupo de trabajo sobre definición de casos de SIDA. *Boletin epidemiologico de la OPS*, 1989,**10**(4): 9-11 / Working group on AIDS case definition, *PAHO Epidemiological Bulletin*, 1989,**10**(4): 9-11.
   WENIGER BG, QUINHOES EP, SERENO AB, *et al.* A simplified surveillance case definition of AIDS derived from empirical clinical data. The Clinical AIDS Study Group, and the Working Group on AIDS case definition. *Journal of Acquired Immune Deficiency Syndromes*, 1992, **5**(12): 1212-1223.
6. BUEHLER JW, DE COCK K, BRUNET J-B. Surveillance definitions for AIDS. *AIDS* 1993, **7**(suppl. 1): S73-S81.

1. 1987 CDC SURVEILLANCE DEFINITION FOR AIDS

1A. Without laboratory evidence of HIV infection (no other causes of immune suppression)

Indicator disease diagnosed definitively

Candidiasis of the oesophagus, trachea, bronchi, or lungs

Cryptococcosis, extrapulmonary

Cryptosporidiosis with diarrhoea persisting >1 month

Cytomegalovirus diseases of an organ other than liver, spleen, or lymph nodes in patient >1 month of age

Herpes simplex virus infection causing a mucocutaneous ulcer persisting >1 month; or bronchitis, pneumonitis, or oesophagitis for any duration in a patient >1 month of age

Kaposi sarcoma in a patient <60 years of age

Lymphoma of the brain (primary) affecting a patient <60 years of age

Mycobacterium avium complex or *M. kansasii* disease, disseminated (site other than/in addition to lungs, skin, cervical or hilar lymph nodes)

Pneumocystis carinii pneumonia

Progressive multifocal leukoencephalopathy

Toxoplasmosis of the brain in a patient >1 month of age

In children <13: 2 or more bacterial infections within a 2-year period (septicaemia, pneumonia, meningitis, bone or joint infections…) or abscess of an internal organ or body cavity – excluding otitis media or superficial abscesses.

1B. With laboratory evidence of HIV infection

Indicator disease diagnosed definitively

Coccidioidomycosis, disseminated (at a site other than or in addition to lungs or cervical or hilar lymph nodes)

HIV encephalopathy

Histoplasmosis, disseminated (other than or in addition to lungs or cervical or hilar lymph nodes)

Isosporiasis with diarrhoea persisting >1 month

Kaposi sarcoma at any age

Lymphoma of the brain (primary) at any age

Non-Hodgkin's lymphoma

Any mycobacterial disease caused by other than *M. tuberculosis*, disseminated

Disease caused by *M. tuberculosis*, extrapulmonary

Salmonella (non-typhoid) septicaemia, recurrent

HIV wasting syndrome

Indicator disease diagnosed presumptively

Candidiasis of the oesophagus

Cytomegalovirus retinitis with loss of vision

Kaposi sarcoma

Mycobacterial disease, disseminated

Pneumocystis carinii pneumonia

Toxoplasmosis of the brain in patient >1 month of age

In children <13: lymphoid interstitial pneumonia and/or pulmonary lymphoid hyperplasia.

2. CONDITIONS ADDED TO CDC SURVEILLANCE DEFINITION FOR AIDS WITH LABORATORY EVIDENCE OF HIV INFECTION (1B above)

In addition to those in the surveillance definition:

- CD4+ T-lymphocyte count <200 x 10^6/litre (or a CD4 percentage <14%)
- Pulmonary tuberculosis
- Cervical cancer, invasive
- Recurrent pneumonia (more than one episode within a 12-month period)

3. EUROPEAN AIDS CASE DEFINITION

Same as revised CDC definition (2 above) without CD4+ T-lymphocyte count.

4. WHO CASE DEFINITION FOR AIDS SURVEILLANCE (formerly BANGUI/WHO/CLINICAL)

WHO clinical case definition for AIDS in an adult or adolescents (>12 years of age) when diagnostic resources are limited. For the purposes of AIDS surveillance an adult or adolescent (>12 years of age) is considered to have AIDS if at least 2 of the following major signs are present in combination with at least 1 of the minor signs listed below, and if these signs are not known to be related to a condition unrelated to HIV infection.

Major signs (2 signs or more):

- Weight loss ≥10% of body weight
- Chronic diarrhoea for >1 month
- Prolonged fever for >1 month (intermittent or constant)

- *Minor signs (1 or more):*
- Persistent cough for >1 month
- Generalized pruritic dermatitis
- History of herpes zoster
- Oropharyngeal candidiasis
- Chronic progressive or disseminated herpes virus infection
- Generalized lymphadenopathy

The presence of either generalized Kaposi sarcoma or cryptococcal meningitis is sufficient for the diagnosis of AIDS for surveillance purposes.

5. EXPANDED WHO CASE DEFINITION FOR AIDS SURVEILLANCE (formerly ABIDJAN)

For the purpose of epidemiological surveillance, an adult (>12 years of age) is considered to have AIDS if a test for HIV antibody shows positive results, and one or more of the following are present:

- 10% body weight loss or cachexia, with diarrhoea or fever, or both, intermittent or constant, for at least 1 month, not known to be due to a condition unrelated to HIV infection
- Cryptococcal meningitis
- Pulmonary or extra-pulmonary tuberculosis
- Kaposi sarcoma
- Neurological impairment sufficient to prevent independent daily activities not known to be due to a condition unrelated to HIV infection (for example, trauma or cerebrovascular accident)
- Candidiasis of the oesophagus (which may presumptively be diagnosed based on the presence of oral candidiasis accompanied by dysphagia)
- Clinically diagnosed life-threatening or recurrent episodes of pneumonia, with or without etiological confirmation
- Invasive cervical cancer

6. REVISED CARACAS/PAHO AIDS DEFINITION

A patient is defined as having AIDS when:

- cumulative points assigned for conditions listed hereafter equal or exceed 10, and
- HIV serology is positive

Cases in which the total point score equals or exceeds the required score of 10, but HIV serology is pending are considered “provisional cases”. Persons with cancer, or with immunosuppressive therapies, or where the sign / symptoms are attributed to conditions other than HIV infection are excluded.

Symptoms / signs / diagnosis	**points assigned**
Kaposi sarcoma	10
Disseminated / extrapulmonary / non-cavitary pulmonary tuberculosis	10
Oral candidiasis / hairy leukoplakia	5
Pulmonary tuberculosis with cavitation, or unspecified	5
Herpes zoster ≤60 years age	5
Central nervous system dysfunction	5
Fever(≥38°C) ≥1 month	2
Cachexia or >10% weight loss	2
Asthenia ≥1 month	2
Persistent dermatitis	2
Anaemia, lymphopenia, and/or thrombocytopenia	2
Persistent cough or any pneumonia (except tuberculosis) for ≥1month	2
Lymphadenopathy ≥1 cm at ≥2 non-inguinal sites	2
Required point score	**≥10**

Contact regional / National AIDS programmes for the case definition in use in a given country.

Case classification

Depends on the case definition.

Please check with National AIDS programmes.

RECOMMENDED TYPES OF SURVEILLANCE

Routine monthly reporting of aggregated data from periphery to intermediate level.

Routine quarterly reporting of aggregated data from intermediate level to central level.

International: report updates every 12 months in the *Weekly Epidemiological Record*

Other sources of data:

- Hospitals
- Practitioners
- Tuberculosis wards
- Mortality reports and statistics
- Active case finding

RECOMMENDED MINIMUM DATA ELEMENTS

Case-based data for reporting

- Unique identifier, age, sex, geographical area, mode of transmission (e.g., blood transfusion, drug use, other)

Aggregated data for reporting

- Number of cases by age and sex, number of cases, mode of transmission (e.g., blood transfusion, drug use, other)

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Graphs: Number of cases by age, sex, geographical area, risk factors.

Tables: Number of cases by age, sex, geographical area, risk factors.

Maps: Number of cases by geographical area.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Assess the magnitude of the problem
- Identify high risk areas for further intervention
- Plan public health measurements
- Assess impact on clinical services
- Plan health care services and supplies
- Validate HIV surveillance data

SPECIAL ASPECTS

Use of HIV surveillance (see page 56) for forecasting AIDS incidence.

CONTACT

Regional Offices
See Regional Communicable Disease contacts on pages 18-23.
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Tel: (41 22) 791 2403 / 2526 Fax: (41 22) 791 4198

A22 *Anthrax*
(human)

RATIONALE FOR SURVEILLANCE

Anthrax is a widespread zoonosis transmitted from domestic animals (cattle, sheep, goats, buffaloes, pigs and other) to humans by direct contact or through animal products. Human anthrax is a serious problem in several countries and has potential for explosive outbreaks (especially the gastro-intestinal form); while pulmonary (inhalation) anthrax is mainly occupational, the threat of biological warfare attacks should not be forgotten. Anthrax has a serious impact on the trade of animal products.

The control of anthrax is based on its prevention in livestock: programmes based only on prevention in humans are costly and likely to be ineffective except for those industrially exposed. There is an effective vaccine for those occupationally exposed, and successful vaccines for livestock, particularly for herds with ongoing exposure to contaminated soil. In most countries anthrax is a notifiable disease. Surveillance is important to monitor the control programmes and to detect outbreaks.

RECOMMENDED CASE DEFINITION

Clinical description

An illness with acute onset characterized by several clinical forms. These are:

(a) localized form:

- *cutaneous:* skin lesion evolving over 1 to 6 days from a papular through a vesicular stage, to a depressed black eschar invariably accompanied by oedema that may be mild to extensive

(b) systemic forms:

- *gastro-intestinal*: abdominal distress characterized by nausea, vomiting, anorexia and followed by fever
- *pulmonary (inhalation)*: brief prodrome resembling acute viral respiratory illness, followed by rapid onset of hypoxia, dyspnoea and high temperature, with X-ray evidence of mediastinal widening
- *meningeal*: acute onset of high fever possibly with convulsions, loss of consciousness, meningeal signs and symptoms; commonly noted in all systemic infections

Laboratory criteria for diagnosis

Laboratory confirmation by **one or more** of the following:

- Isolation of *Bacillus anthracis* from a clinical specimen (e.g., blood, lesions, discharges)
- Demonstration of *B. anthracis* in a clinical specimen by microscopic examination of stained smears (vesicular fluid, blood, cerebrospinal fluid, pleural fluid, stools)
- Positive serology (ELISA, Western blot, toxin detection, chromatographic assay, fluorescent antibody test (FAT))

Note: It may not be possible to demonstrate *B. anthracis* in clinical specimens if the patient has been treated with antimicrobial agents.

Case classification

Suspected: A case that is compatible with the clinical description **and** has an epidemiological link to confirmed or suspected animal cases or contaminated animal products.

Probable: A suspected case that has a positive reaction to allergic skin test (in non-vaccinated individuals).

Confirmed: A suspected case that is laboratory-confirmed.

RECOMMENDED TYPES OF SURVEILLANCE

Since the usual ratio of livestock cases to human cases is of the order of 10-20:1, it is ineffective to depend only on human case reports. Routine surveillance must be undertaken, especially in high-risk groups (slaughterhouse workers, shepherds, veterinarians, wool/hide workers), and unexplained sudden livestock deaths must be investigated. Immediate case-based reporting from peripheral level (health care providers or laboratory) to intermediate and central levels of public health sector and to the appropriate level of animal health sector is mandatory. All cases must be investigated.

Routine monthly reporting of aggregated data on confirmed cases and investigation reports from intermediate to central level in public health and animal health sectors.

RECOMMENDED MINIMUM DATA ELEMENTS

Case-based data for investigation and reporting

- Case classification by type (suspected / probable / confirmed), and by clinical form (cutaneous / gastro-intestinal / pulmonary (inhalation) / meningeal)
- Unique identifier, age, sex, geographical information, occupation
- Date of onset, date of reporting
- Exposure history
- Outcome

Aggregated data for reporting to central level

- Number of confirmed cases by age, sex, clinical form (cutaneous / gastro-intestinal / pulmonary (inhalation) / meningeal)
- Similarly for livestock by outbreaks and cases in relation to species and appropriate geographic / administrative area

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Graphs: Number of suspected / probable / confirmed cases by date.
Tables: Number of suspected / probable / confirmed cases by date, age, sex, geographical area.
Maps: Number of human and animal cases by geographical area.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

Surveillance data

- Estimate the magnitude of the problem in humans and animals
- Monitor the distribution and spread of the disease in humans and animals
- Detect outbreaks in humans and animals
- Monitor and evaluate the impact of prevention activities in humans and of control measures in animals

Investigation data

- Identify populations at risk
- Identify potentially contaminated products of animal origin
- Identify potentially contaminated animal sources (herds or flocks)

SPECIAL ASPECTS

The surveillance activities of both public health and animal health sectors must be fully coordinated and integrated. Administrative arrangements between the two sectors must be established to facilitate immediate cross-notification of cases/outbreaks, as well as joint case/outbreak investigations. Surveillance and control programmes should be promoted in high-risk areas, such as those with high pH / calcareous soils.

CONTACT

Regional Offices
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A23 *Brucellosis*
(human)

RATIONALE FOR SURVEILLANCE

Brucellosis is the most widespread zoonosis transmitted from animals (cattle, sheep, goats, pigs, camels and buffaloes), through direct contact with blood, placenta, foetuses or uterine secretions, or through consumption of infected raw animal products (especially milk and milk products). Human brucellosis due to *Brucella melitensis* has serious public health consequences in areas where sheep and goat are raised. Brucellosis has an important worldwide impact on human health and the animal industry. In most countries brucellosis is a notifiable disease. Control measures are based on prevention. Surveillance is a key element for management of prevention and control programmes.

RECOMMENDED CASE DEFINITION

Clinical description

An illness characterized by acute or insidious onset, with continued, intermittent or irregular fever of variable duration, profuse sweating particularly at night, fatigue, anorexia, weight loss, headache, arthralgia and generalized aching. Local infection of various organs may occur

Laboratory criteria for diagnosis

- Isolation of *Brucella spp.* from clinical specimen **or**
- Brucella agglutination titre (e.g., standard tube agglutination tests: SAT>160) in one or more serum specimens obtained after onset of symptoms **or**
- ELISA (IgA, IgG, IgM), 2-mercaptoethanol test, complement fixation test, Coombs, fluorescent antibody test (FAT), and radioimmunoassay for detecting antilipopolysaccharide antibodies; and counterimmunoelectrophoresis (CIEP)

Case classification

Suspected: A case that is compatible with the clinical description **and** is epidemiologically linked to suspected or confirmed animal cases or contaminated animal products.

Probable: A suspected case that has a positive Rose Bengal test.

Confirmed: A suspected or probable case that is laboratory-confirmed.

RECOMMENDED TYPES OF SURVEILLANCE

Routine surveillance must be undertaken, particularly among high-risk groups (farmers, shepherds, workers in slaughterhouses, butchers, veterinarians, laboratory personnel).

Mandatory early case-based reporting by health care providers or laboratory to upper levels of the public health sector as well as to the appropriate level of the animal health sector. In endemic countries where investigation of all reported cases may not be feasible, a representative proportion of reported cases should be investigated routinely.

RECOMMENDED MINIMUM DATA ELEMENTS

Case-based data for investigation and reporting

- Case classification
- Unique identifier, age, sex, geographical information, occupation and ethnic group if appropriate

Date of clinical onset, date of reporting

- Exposure history
- Outcome

Aggregated data

- Number of cases by case classification (probable / confirmed), age, sex, geographical area, occupation

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Graphs: Number of probable / confirmed cases by month.

Tables: Number of probable / confirmed cases by age, sex, month, place.

Maps: Number of probable / confirmed cases by place.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

Surveillance data

- Estimate the magnitude of the problem in humans and animals
- Monitor the distribution of the disease in humans and animals
- Monitor and evaluate impact of prevention activities in humans, and of control / elimination measures in animals

Investigation data

- Identify populations at risk
- Identify potentially contaminated products of animal origin
- Identify potentially infected animal sources (herds or flocks)

SPECIAL ASPECTS

The surveillance activities of both public health and animal health sectors must be fully coordinated and integrated. Administrative arrangements between the two sectors must be established to facilitate immediate cross-notification of cases, as well as joint investigations.

Surveillance and control programmes must be promoted in goat-raising areas.

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A00 *Cholera*

Case report universally required by *International Health Regulations*

RATIONALE FOR SURVEILLANCE

Cholera causes an estimated 120 000 deaths per year and is prevalent in 80 countries. The world is currently experiencing the 7th pandemic. In Africa epidemics have become more frequent and case-fatality rates are high. Refugee or displaced populations are at major risk of epidemics due to the conditions prevailing in the camps (unsafe water, poor sanitation and hygiene). Control of the disease requires appropriate surveillance with universal case reporting. Health education of the population at risk and improvement of living conditions are essential preventive measures. Case reporting universally is required by the *International Health Regulations.*

RECOMMENDED CASE DEFINITION

Clinical case definition

- *In an area where the disease is not known to be present:* severe dehydration or death from acute watery diarrhoea in a patient aged 5 years or more **or**
- *In an area where there is a cholera epidemic:* acute watery diarrhoea, with or without vomiting in a patient aged 5 years or more*

Laboratory criteria for diagnosis

Isolation of *Vibrio cholerae* O1 or O139 from stools in any patient with diarrhoea.

Case classification

Suspected: A case that meets the clinical case definition.

Probable: Not applicable.

Confirmed: A suspected case that is laboratory-confirmed.

Note: In a cholera-threatened area, when the number of "confirmed" cases rises, shift should be made to using primarily the "suspected" case classification.

* Cholera does appear in children under 5 years; however, the inclusion of all cases of acute watery diarrhoea in the 2-4 year age group in the reporting of cholera greatly reduces the specificity of reporting. For management of cases of acute watery diarrhoea in an area where there is a cholera epidemic, cholera should be suspected in all patients.

RECOMMENDED TYPES OF SURVEILLANCE

Routine surveillance (this may be integrated with surveillance of diarrhoeal diseases: see acute watery diarrhoea).

Immediate case-based reporting of suspected cases from periphery to intermediate level and central level. All suspected cases and clusters should be investigated.

Aggregated data on cases should also be included in routine weekly / monthly reports from peripheral to intermediate and central level.

International:

The initial suspected cases should be reported to WHO (mandatory).

Aggregated data on cases should be reported to WHO (mandatory).

Outbreak situations:

- During outbreak situations surveillance must be intensified with the introduction of active case finding
- Laboratory confirmation to be performed as soon as possible
- Thereafter weekly reports of cases, ages, deaths, regions, and hospital admissions to be set up

RECOMMENDED MINIMUM DATA ELEMENTS

Case-based data for investigation and reporting

- Age, sex, geographical information
- Hospitalization (Y / N)
- Outcome

Aggregated data for reporting

- Number of cases by age, sex
- Number of deaths

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

- Use weekly numbers, not moving averages
- Case-fatality rates (graphs)
- Weekly / monthly plots by geographical area (district) and age group (GIS) (graphs)
- Comparisons with same period in previous five years

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Detect outbreaks, estimate the incidence and case-fatality rate
- Undertake appropriately timed investigations
- Assess the spread and progress of the disease
- Plan for treatment supplies, prevention and control measures
- Determine the effectiveness of control measures

SPECIAL ASPECTS

At least one reference laboratory in each country is recommended for species identification.

Once the presence of cholera in an area has been confirmed, it becomes unnecessary to confirm all subsequent cases; shift should be made to using primarily the “suspected“ case classification.

Monitoring an epidemic should, however, include laboratory confirmation of a small proportion of cases on a continuing basis.

For countries where cholera is rare or previously unrecognized, the first cases should be confirmed by laboratory diagnosis (including demonstration of toxigenic *Vibrio cholerae* O1 or O139 in faeces if possible).

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A81.0 *Creutzfeldt-Jakob disease*

RATIONALE FOR SURVEILLANCE:

The incidence of Creutzfeldt-Jakob Disease (CJD) and its variants is not currently monitored in many parts of the world. In 1996 a new variant of CJD (nvCJD) was recognized in the United Kingdom. An etiological link has since been confirmed between nvCJD and the agent of bovine spongiform encephalopathy (BSE). The size of the population exposed and susceptible to this agent in the United Kingdom is not known; this, in addition to uncertainties relating to the potential length and distribution of the incubation period, complicate any useful prediction of the future number of nvCJD cases. Other populations may have also been exposed to the agent through importation of live cattle or cattle by-products from BSE-affected countries, or through the use of medicinal or cosmetic products containing affected bovine tissues. Global surveillance of the new variant and other forms of CJD shall lead to a better understanding of the disease, including potential causes of iatrogenic CJD as well as the distribution of various hereditary forms. It shall also provide information towards protection against the risks of disease.

RECOMMENDED CASE DEFINITIONS of CJD and CJD subtypes

1. Sporadic CJD

(a) *Possible CJD*:

- Progressive dementia; **and**
- EEG atypical or not known **and**
- Duration <2 years **and**
- **At least 2 out of the following 4 clinical features:** myoclonus, visual or cerebellar disturbance, pyramidal / extrapyramidal dysfunction, akinetic mutism

(b) *Probable CJD:*

(in the absence of an alternative diagnosis from routine investigation)

- Progressive dementia; **and**
- At least 2 of the following 4 clinical features:
- Myoclonus
- Visual or cerebellar disturbance
- Pyramidal / extrapyramidal dysfunction
- Akinetic mutism

and

- A typical EEG, whatever the clinical duration of the disease, **and/or**
- A positive 14-3-3 assay for CSF and a clinical duration to death <2years

(c) *Confirmed (definite) CJD:*

- Neuropathological confirmation; **and/or**
- Confirmation of protease-resistant prion protein (PrP) (immunocytochemistry or Western blot) **and/or**
- Presence of scrapie-associated fibrils

2. Iatrogenic CJD

- Progressive cerebellar syndrome in a recipient of human cadaver-derived pituitary hormone; **or**
- Sporadic CJD with a recognized exposure risk

3. Familial CJD

- Confirmed or probable CJD **plus** confirmed or probable CJD in a first degree relative **and/or**
- Neuropsychiatric disorder **plus** disease-specific PrP mutation

Note: For purposes of surveillance, includes Gerstmann-Sträussler-Scheinker (GSS) syndrome and fatal familial insomnia (FFI).

4. New variant CJD (nvCJD)

New variant CJD cannot be diagnosed with certainty on clinical criteria alone at present. On the basis of the few neuropathologically confirmed cases, the diagnosis of nvCJD should be considered as a possibility in a patient with a progressive neuropsychiatric disorder and at least 5 of the following 6 clinical features:

- Early psychiatric symptoms
- Early persistent paraesthaesia / dysaesthesia
- Ataxia
- Chorea / dystonia or myoclonus
- Dementia
- Akinetic mutism

The suspicion of nvCJD for surveillance purposes is strengthened by the following:

- No history of potential iatrogenic exposure
- Clinical duration >6 months
- Age at onset <50 years
- No *PrP* gene mutation
- EEG does not show the typical periodic appearance
- Routine investigations do not suggest an alternative diagnosis
- Magnetic Image Resonance shows abnormal symmetrical and bilateral high signals from the pulvinar on axial T2- and/or proton-density-weighted images

A patient with a progressive neuropsychiatric disorder and 5 out of the 6 clinical criteria mentioned earlier plus all of the criteria of suspicion listed immediately above should be considered as a suspect case of nvCJD for surveillance purposes.

Confirmed (definite)

Neuropathology is mandatory for the diagnosis of definite nvCJD: the use of cerebral biopsy in living patients is to be discouraged unless its purpose is to arrive at an alternative diagnosis of a treatable disorder. Autopsy (or *post-mortem* biopsy of the brain where autopsy is not possible) is strongly encouraged in any suspect case of CJD. See under “special aspects” for the neuropathological criteria in CJD and other human transmissible spongiform encephalopathies.

RECOMMENDED TYPES OF SURVEILLANCE

One centre should be identified at central level to carry out surveillance.

All reporting should be case-based.

All definite, probable and possible cases should be notified by the appropriate health care professionals (usually physicians, neurologists, psychiatrists, neuropathologists) to the centre responsible for surveillance.

Note: Death registrations should be checked in order to identify cases not detected by routine surveillance.

RECOMMENDED MINIMUM DATA ELEMENTS

Case-based data for reporting

- Subtype and classification of CJD
- Age, sex, country of birth, geographical information, occupation
- Date of onset, date of death
- Vital status (alive, dead)

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Number of cases by subtype, classification, occupational group, geographical area.

Number of cases by year of death, by age at death.

Sex ratio.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Plot the trend in incidence of CJD subtypes
- Detect clusters of cases requiring further investigation
- Identify risk factors for disease

SPECIAL ASPECTS

Neuropathological criteria for CJD and other human transmissible spongiform encephalopathies can be summarized as follows:

Creutzfeldt-Jakob disease: *sporadic, iatrogenic* (recognized risk) or *familial* (same disease in first degree relative or disease-associated *PrP* gene mutation):

- Spongiform encephalopathy in cerebral and/or cerebellar cortex and/or subcortical grey matter; **and/or**
- Encephalopathy with prion protein (PrP) immunoreactivity (plaque and/or diffuse synaptic and/or patchy/perivacuolar types)

New variant CJD

- Spongiform encephalopathy with abundant PrP deposition, in particular multiple fibrillary PrP plaques surrounded by a halo of spongiform vacuoles ('florid' plaques, 'daisy-like' plaques) and other PrP plaques, and amorphous pericellular and perivascular PrP deposits especially prominent in the cerebellar molecular layer

Gerstmann-Sträussler-Scheinker (GSS) disease: (in family with dominantly inherited progressive ataxia and/or dementia and one of a variety of *PrP* gene mutations):

- Encephalo(myelo)pathy with multicentric PrP plaques
- Thalamic degeneration, variable spongiform change in cerebrum

Kuru

- Spongiform encephalopathy in the Fore population of Papua New Guinea

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A90, A91 Dengue fever (A90) including Dengue haemorrhagic fever (DHF) & Dengue shock syndrome (DSS, A91)

RATIONALE FOR SURVEILLANCE

Dengue fever, including DHF and DSS, is the most significant arthropod-borne viral disease worldwide. It occurs in over 100 countries and territories and threatens the health of over 2 500 million people in tropical and subtropical regions. Dengue fever is a severe disease with high epidemic potential. An estimated 500 000 patients, 90% of them below the age of 15, are hospitalized with DHF / DSS every year. WHO aims to accelerate the final development of an attenuated dengue vaccine.

RECOMMENDED CASE DEFINITION

DENGUE FEVER

Clinical description

An acute febrile illness of 2-7 days duration with 2 or more of the following:

headache, retro-orbital pain, myalgia, arthralgia, rash, haemorrhagic manifestations, leucopenia.

Laboratory criteria for diagnosis

One or more of the following:

- Isolation of the dengue virus from serum, plasma, leukocytes, or autopsy samples
- Demonstration of a fourfold or greater change in reciprocal IgG or IgM antibody titres to one or more dengue virus antigens in paired serum samples
- Demonstration of dengue virus antigen in autopsy tissue by immunohistochemistry or immunofluorescence or in serum samples by EIA
- Detection of viral genomic sequences in autopsy tissue, serum or CSF samples by polymerase chain reaction (PCR)

Case classification

Suspected: A case compatible with the clinical description.

Probable: A case compatible with the clinical description with **one or more** of the following:

- supportive serology (reciprocal haemagglutination-inhibition antibody titre ≥1280, comparable IgG EIA titre or positive IgM antibody test in late acute or convalescent-phase serum specimen).
- occurrence at same location and time as other confirmed cases of dengue fever.

Confirmed: A case compatible with the clinical description, laboratory-confirmed.

DENGUE HAEMORRHAGIC FEVER

A probable or confirmed case of dengue **and**

Haemorragic tendencies evidenced by **one or more of the following:**

- Positive tourniquet test
- Petechiae, ecchymoses or purpura
- Bleeding: mucosa, gastrointestinal tract, injection sites or other
- Haematemesis or melaena

And thrombocytopenia (100 000 cells or less per mm^3)

And evidence of plasma leakage due to increased vascular permeability, manifested by one or more of the following:

- ≥20% rise in average haematocrit for age and sex
- ≥20% drop in haematocrit following volume replacement treatment compared to baseline
- signs of plasma leakage (pleural effusion, ascites, hypoproteinaemia)

DENGUE SHOCK SYNDROME

All the above criteria, **plus** evidence of circulatory failure manifested by rapid and weak pulse, and narrow pulse pressure (≤20 mm Hg) or hypotension for age, cold, clammy skin and altered mental status.

RECOMMENDED TYPES OF SURVEILLANCE

Areas where no dengue transmission has been detected but where *Aedes aegypti* occurs

Surveillance of suspected cases with investigation of clusters of suspected cases for dengue.

Countries where disease is endemic with seasonal variations in transmission, and areas where epidemic dengue occurs

Routine weekly / monthly reporting of aggregated data of suspected, probable and confirmed cases from peripheral to intermediate and central levels.

RECOMMENDED MINIMUM DATA ELEMENTS

Case-based data at the peripheral level

- Case classification (suspected / probable / confirmed), serotype, DHF / DSS present (Y/N)
- Unique identifier, name of patient, age, sex, geographical information
- Date of onset
- Hospitalized (Y/N)
- Outcome
- Travel history during past 2 weeks

Aggregated data for reporting

- Number of cases by age group
- Number of confirmed (and serotype)
- Number of DHF / DSS cases by age group
- Number of hospitalizations and deaths

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Percentage of DHF / DSS cases and of hospitalizations.

Case-fatality rate.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Target high risk areas for intervention
- Monitor changes in serotype and rate of DHF / DSS
- Monitor trends in endemic disease or re-emergence of disease

SPECIAL ASPECTS

Parallel to disease surveillance, vector surveillance of both larval and adult populations of *Ae. aegypti* and *Ae. albopictus.*

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A36 *Diphtheria*

RATIONALE FOR SURVEILLANCE

Diphtheria is a widespread severe infectious disease that has potential for epidemics. The control of diphtheria is based on the following 3 measures:

1. Primary prevention of disease by ensuring high population immunity through immunization.
2. Secondary prevention of spread through rapid investigation of close contacts, in order to ensure proper treatment.
3. Tertiary prevention of complications and deaths through early diagnosis and proper management.

Surveillance data can be used to monitor levels of immunization coverage (target >90%) and disease as a measure of the impact of control programmes. Recent epidemics have highlighted the need for adequate surveillance and epidemic preparedness.

RECOMMENDED CASE DEFINITION

Clinical description

An illness of the upper respiratory tract characterized by laryngitis **or** pharyngitis **or** tonsillitis, ***and***

- adherent membranes of tonsils, pharynx and/or nose

Laboratory criteria for diagnosis

Isolation of *Corynebacterium diphtheriae* from a clinical specimen.

Note: A rise in serum antibody (fourfold or greater) is of interest only if *both* serum samples were obtained before administration of diphtheria toxoid or antitoxin. This is not usually the case in surveillance, where serological diagnosis of diphtheria is thus unlikely to be an issue.

Case classification

Suspected: Not applicable.

Probable: A case that meets the clinical description.

Confirmed: A probable case that is laboratory confirmed or linked epidemiologically to a laboratory confirmed case.

Note: Persons with positive *C. diphtheriae* cultures who do not meet the clinical description (i.e. asymptomatic carriers) should not be reported as probable or confirmed diphtheria cases.

RECOMMENDED TYPES OF SURVEILLANCE

- Routine monthly reporting of aggregated data of probable or confirmed cases is recommended from peripheral level to intermediate and central levels; zero reporting required at all levels
- All outbreaks must be investigated immediately and case-based data collected
- In countries achieving low incidence (usually where immunization coverage is >85%-90%) immediate reporting of case-based data for probable or confirmed cases is recommended from peripheral to intermediate and central levels

Aggregated data on probable of confirmed cases and on immunization coverage must be reported from national level to WHO Regional Offices according to regional specifications.

RECOMMENDED MINIMUM DATA ELEMENTS

Aggregated data:

- Number of cases
- Number of third doses of diphtheria-tetanus-pertussis vaccine (DTP3) administered to infants

Case-based data:

- Unique identifier
- Geographical area (e.g., district) name
- Date of birth

- Date of onset
- Date of first treatment
- Treatment type: 1=antibiotic & antitoxin; 2=antibiotic only; 3=antitoxin only; 4=no or other treatment; 9=unknown
- Laboratory result: 1=toxigenic *C. diphtheriae* isolated; 2=non-toxigenic *C. diphtheriae* isolated; 3=*C. diphtheriae* isolated, toxigenicity unknown; 4=*C. diphtheriae* not isolated; 6=no specimen processed; 9=unknown
- Total number of doses of diphtheria vaccine (DPT, DT or Td) received
- Date of last dose
- Final classification of the case: 1=confirmed; 2=probable; 3=discarded
- Outcome: 1=alive; 2=dead; 3=unknown

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Aggregated data:

- Incidence rate by month, year, and geographic area
- DPT3 coverage by year and geographic area
- Completeness / timeliness of monthly reporting
- Proportional morbidity (compared to other diseases of public health importance)

Case-based data: same as aggregated data plus the following:

- Age-specific incidence rate
- Cases by immunization status, laboratory results, treatment type
- Cases treated "on time" (≤7days of onset)
- Case-fatality rate
- Proportional mortality (compared to other diseases of public health importance)

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Monitor case-fatality rate and, if high, determine cause (e.g., poor case management, lack of antibiotics / anti-toxin, patients not seeking treatment in time) so that corrective action can be taken
- Determine age-specific incidence rate, geographical area, and season of diphtheria cases, to know risk groups and risk period
- Monitor incidence rate to assess impact of control efforts
- Monitor immunization coverage per geographical area to identify areas of poor programme performance
- Detect outbreaks and implement control measures
- Investigate outbreaks to understand epidemiology, determine why the outbreak occurred (e.g., vaccine failure, failure to immunize, accumulation of susceptibles, waning immunity, new toxigenic strain), and ensure proper case management

Note: In addition to surveillance, carefully designed serologic studies can be used to monitor the immune status of different age groups.

SPECIAL ASPECTS

Further information is available from the Expanded Programme on Immunization.

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B72 Dracunculiasis (Guinea worm disease)

RATIONALE FOR SURVEILLANCE

Dracunculiasis is the subject of a global **eradication** programme (9GPW, target 6.1). Surveillance is therefore essential to identify and contain all individual cases in endemic countries as well as in countries where environmental conditions are appropriate for local transmission of the disease.

RECOMMENDED CASE DEFINITION

Clinical case definition

A case of dracunculiasis is defined as an individual exhibiting or having a history of a skin lesion with the emergence of a Guinea worm. A recent history (within one year) of a skin lesion with emergence of a Guinea worm (*Dracunculus medinensis*) is the only time-frame which must be used in surveillance programmes.

RECOMMENDED TYPES OF SURVEILLANCE

Peripheral level: In all endemic and formerly endemic countries, *village-based* surveillance aims to detect cases while the worm is pre-emergent or at latest 24 hours after the beginning of worm emergence, even in the most remote local villages. Community-oriented case-containment interventions are combined with surveillance to interrupt further transmission of the disease. The lack of previously trained health workers in very remote localities and the needs of health workers in newly identified endemic villages continue to make training an important activity.

Intermediate / central level*:* Reports (aggregated data) are gathered from all villages to intermediate level and channelled towards the central level on a monthly basis. This is generally combined with supervision activities at all levels of the national dracunculiasis eradication programmes. When the annual incidence is close to zero, cases should be reported on a weekly or even daily basis.

International level: Reports from endemic countries are aggregated and reported to the international level on a monthly basis, and used as a policy basis and for managerial decisions by central programmes, as well as by external supporting agencies.

RECOMMENDED MINIMUM DATA ELEMENTS

Case-based data:

Unique identifier*,* sex, age, geographical coordinates of the village involved, date of diagnosis, case isolation measures taken.

Aggregated data:

For every village, number of cases by month and year.

RECOMMENDED DATA ANALYSIS, PRESENTATION, REPORTS

Monthly and yearly incidence by village, geographic origin of imported cases.

Analysis of monthly and yearly changes in the distribution of infected villages.

Mapping of data including the matching of endemic villages with water distribution data, using geographical information system (GIS).

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Plan interventions and supervision at all levels of the programme
- Monitor progress and the need for resources of various types
- Identify variations in case-containment efficacy
- Identify technical and operational difficulties at all levels
- Identify areas needing special interventions, training and supervision
- Evaluate the impact of programme activities

SPECIAL ASPECTS

None.

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A98.3, A98.4 Ebola-Marburg viral diseases

RATIONALE FOR SURVEILLANCE

Ebola haemorrhagic fever is a rare but severe disease occurring primarily in areas of African rain forest. The disease is characterized by person-to-person transmission through close contact with patients, dead bodies or infected body fluids. Epidemics of the disease can be dramatically amplified in health care centres with poor hygiene standards; the attendant potential for explosive nosocomial infection constitutes the main threat to public health posed by the disease. Surveillance is aimed at early detection of cases in order to avoid epidemics and possible international spread of the disease.

Marburg virus infections are extremely rare. They appear to be similar to Ebola haemorrhagic fever and recommendations for both viral infections are the same.

RECOMMENDED CASE DEFINITION

Clinical description

Ebola haemorrhagic fever begins with acute fever, diarrhoea that can be bloody (referred to as "diarrhée rouge" in francophone Africa), and vomiting. Headache, nausea, and abdominal pain are common. Conjunctival injection, dysphagia, and haemorrhagic symptoms such as nosebleeds, bleeding gums, vomiting of blood, blood in stools, purpura may further develop. Some patients may also show a maculopapular rash on the trunk. Dehydration and significant wasting occur as the disease progresses. At a later stage, there is frequent involvement of the central nervous system, manifested by somnolence, delirium, or coma. The case-fatality rate ranges from 50% to 90%.

Laboratory criteria for diagnosis

Supportive:

- Positive serology (ELISA for IgG and/or IgM), **or**

Confirmatory:

- Positive virus isolation *(only in a laboratory of biosafety level 4)* **or**
- Positive skin biopsy (immunohistochemistry) **or**
- Positive PCR

Case classification

Suspected: A case that is compatible with the clinical description.

Probable: *in epidemic situation:*

- Any person having had contact with a clinical case and presenting with acute fever, **or**
- Any person presenting with acute fever and 3 of the following symptoms: headache, vomiting / nausea, loss of appetite, diarrhoea, intense fatigue, abdominal pain, general or articular pain, difficulty in swallowing, difficulty in breathing, hiccoughs, **or**
- Any unexplained death

Confirmed: Any suspected or probable case that is laboratory-confirmed.

Contact: *in epidemic situation:*
An asymptomatic person having had physical contact within the past 21 days with a confirmed or probable case or his/her body fluids (e.g., care for patient, participation in burial ceremony, handling of potentially infected laboratory specimens).

In epidemic situations and after laboratory confirmation of a few initial cases, there is no need for individual laboratory confirmation and the use of "suspected or probable" case classifications is sufficient for surveillance and control purposes.

RECOMMENDED TYPES OF SURVEILLANCE

In endemic areas and in the absence of an epidemic:

Immediate reporting of suspected cases from the periphery to intermediate and central levels to ensure rapid investigation and laboratory confirmation.

Note: Routine surveillance of Ebola haemorrhagic fever must be integrated with routine surveillance for other viral haemorrhagic fevers (e.g., Crimean-Congo fever, Lassa fever, Rift Valley fever, yellow fever).

In epidemic situations:

- Intensified surveillance and active finding of all suspected and probable cases for immediate isolation, and of all contact subjects for daily medical follow-up
- The surveillance area should be monitored for a duration corresponding to 2 estimated incubation periods after the date of death or hospital discharge of the last case
- A rumour registry should be established to create a systematic registration of rumours of cases reported by the population
- A single source of official information is essential to ensure coherence and avoid confusion in the public

RECOMMENDED MINIMUM DATA ELEMENTS

Case-based data for reporting and investigation

- Case classification (suspected / probable / confirmed)
- Unique identifier, name, age, sex
- Geographical information, name of head of family, name of father (if child)
- Profession, place of work
- Date of onset of fever, symptoms, signs
- Hospitalization, including date
- Death including date
- Contact with previous case, including date
- Nature and date of clinical samples taken for laboratory investigation (if any)

Aggregated data for reporting

- Number of cases (suspected / probable / confirmed) by age, sex
- Number of deaths

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS *(EPIDEMIC SITUATIONS)*

An epidemiological bulletin should be sent daily to local health authorities and to WHO headquarters. It should include the following information:

Cases:

- Total cumulative number of cases
- Total cumulative number of deaths
- Current number of patients
- Current number of hospitalized patients
- Date of last identified case
- Date of death or hospital discharge of the last reported case

Breakdown by sex and age group can also be provided

Contacts:

- Current number of contacts requiring follow up
- Current number of contacts under proper follow-up

Breakdown by sex and age group can also be provided

When possible, the geographic distribution of cases and contacts should be provided, as well as a simple epidemic curve.

Case-fatality rates, attack rates, and age-specific attack rates can be calculated for epidemiological assessment.

A more detailed report summarizing events and data should be produced weekly and a complete report should be available at the end of the epidemic.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

Routine surveillance data

- Detect an isolated case or an outbreak and immediately take appropriate measures to avoid an epidemic

Active case finding and contact tracing during outbreaks are essential for control

- Identify all cases and contacts
- Assess and monitor the spread of an outbreak
- Evaluate control measures
- Provide a basis for research (epidemiological data, clinical specimens)

SPECIAL ASPECTS

Since extreme biohazard is associated with sampling, transportation and laboratory investigation, strictly applied biosafety procedures and appropriate isolation of patients are essential.

All known Ebola strains from Africa produce disease in humans; one Ebola strain from the Philippines (Reston) has infected humans without producing disease.

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A83.0 *Japanese encephalitis*

RATIONALE FOR SURVEILLANCE

Over a large part of East Asia, the Japanese encephalitis (JE) virus is the most common cause of encephalitis. This mosquito-borne encephalitis has a potential for outbreaks and can be associated with a high case-fatality rate. Three strategies for control based on the natural transmission cycle of Japanese encephalitis have been proposed:

- vector control
- vaccination of swine (virus-amplifying host associated with human epidemic disease)
- vaccination of humans

Surveillance should target these elements.

RECOMMENDED CASE DEFINITION

Clinical description

Japanese encephalitis virus infection may result in a febrile illness of variable severity associated with neurological symptoms ranging from headache to meningitis or encephalitis. Symptoms can include: headache, fever, meningeal signs, stupor, disorientation, coma, tremors, paresis (generalized), hypertonia, loss of coordination. The encephalitis cannot be distinguished clinically from other central nervous system infections.

Laboratory criteria for diagnosis

Presumptive:

Detection of an acute phase anti-viral antibody response through one of the following:

- Elevated and stable serum antibody titres to JE virus through ELISA, haemagglutination-inhibition or virus neutalization assays **or**
- IgM antibody to the virus in the serum

Confirmatory:

- Detection of the JE virus, antigen or genome in tissue, blood or other body fluid by immunochemistry or immunofluorescence or PCR, **or**
- JE virus-specific IgM in the CSF, **or**
- Fourfold or greater rise in JE virus-specific antibody in paired sera (acute and convalescent phases) through IgM / IgG, ELISA, haemagglutination inhibition test or virus neutalization test, in a patient with no history of recent yellow fever vaccination and where cross-reactions to other flaviviruses have been excluded

Note: JE infections are common and the majority are asymptomatic. JE infections may occur concurrently with other infections causing central nervous system symptoms, and serological evidence of recent JE viral infection may not be correct in indicating JE to be the cause of the illness.

Case classification

Suspected: A case that is compatible with the clinical description.

Probable: A suspected case with presumptive laboratory results.

Confirmed: A suspected case with confirmatory laboratory results.

RECOMMENDED TYPES OF SURVEILLANCE

Areas where no Japanese encephalitis transmission has been detected but where the vector is present:

Surveillance for acute central nervous system syndromes; investigation of clusters with fever.

Areas where disease is endemic with seasonal variation in transmission, and areas where epidemic Japanese encephalitis is occurring:

Routine weekly / monthly reporting of aggregated data on suspected, probable and confirmed cases from peripheral to intermediate and central level.

RECOMMENDED MINIMUM DATA ELEMENTS

Case-based data at the peripheral level

- Case classification (suspected / probable / confirmed)
- Unique identifier name of patient, age, sex, geographical information
- Date of onset
- Travel history over the past 2 weeks
- Hospitalization (Y/N)
- Outcome

Aggregated data for reporting

- Number of cases by age group
- Number of suspected / confirmed cases
- Number of hospitalizations and deaths

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Number of cases and deaths by geographic area.
Number of hospitalizations.
Case-fatality rate.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Target high risk areas for intervention
- Monitor changes in epidemiology and pattern of disease
- Monitor trends in endemic disease or re-emergence of disease
- Monitor vaccine efficacy

SPECIAL ASPECTS

Epidemic transmission in temperate zones is seasonal (summer of monsoon season months).

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B74 *Lymphatic filariasis*

RATIONALE FOR SURVEILLANCE

Lymphatic filariasis remains a major cause of overt or hidden clinical disease in much of Asia, Africa, the Western Pacific and certain parts of the Americas. It is the second leading cause of permanent long-term disability. The prevalence is increasing world-wide, with at least 120 million people affected at different stages of the disease. Both diethylcarbamazine (DEC) and ivermectin, given as single doses, have been shown to be very effective in reducing microfilaraemia, especially when administered together, or singly with a single dose of albendazole.

Because of highly effective diagnostic and treatment tools, filariasis was identified by the International Task Force on Disease Eradication as one of 6 potentially eradicable diseases. Current WHO policy is to achieve elimination of infection in humans mainly through single-dose drug combinations administered once a year to all 'at risk' populations. Management of disease induced by lymphatic damage from the infection (especially elephantiasis and genital damage) is the second essential element in WHO policy. Surveillance is essential to identify previously undetected foci of infection and to monitor the reduction of microfilariae resulting from elimination efforts.

RECOMMENDED CASE DEFINITION

Clinical case definition

Hydrocoele or lymphoedema in a resident of an endemic area for which other causes of these findings have been excluded.

Laboratory criteria for diagnosis

Microfilaria positive, antigen positive or biopsy positive.

Case classification

Suspected: Not applicable.

Probable: A case that meets the clinical case definition.

Confirmed: A person with laboratory confirmation even if he/she does not meet the clinical case definition.

RECOMMENDED TYPES OF SURVEILLANCE

There are currently three options and the choice will depend on the local situation:

- Routine monthly reporting of aggregated data on probable and confirmed cases from periphery to intermediate level and to central level **or**
- Sentinel population surveys (standardized and periodical) **or**
- Active case finding through surveys of selected groups or through mass surveys

International: Annual reporting from central level to WHO (for a limited number of countries).

RECOMMENDED MINIMUM DATA ELEMENTS

Case-based data at peripheral level

- Case classification (probable / confirmed)
- Unique identifier
- Geographical information (location)
- Laboratory result

Aggregated data for reporting

- Number of new cases
- Number of laboratory-confirmed cases
- Number of chronic conditions (hydrocoele or lymphoedema)

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

- Number of cases by geographical area and by year
- Monthly and yearly incidence, point prevalence (if active case detection), by geographic origin, by sex, by parasitological diagnosis

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Estimate the magnitude of the problem and define populations at risk
- Improve and focus the elimination activities
- Improve the management and follow-up of filariasis-infected patients
- Identify technical and operational difficulties

SPECIAL ASPECTS

None.

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B96.3 *Haemophilus influenzae type b*

(Hib disease)

RATIONALE FOR SURVEILLANCE

Haemophilus influenzae type b (Hib) is the main cause of bacterial meningitis in children, and one of the 2 most common causes of severe bacterial pneumonia, which is the largest single remaining infectious disease killer of young children in the developing world. Hib may also cause other diseases, including arthritis, skin infection, and epiglottitis. Surveillance is critical to clarify the impact of disease and that of immunization programmes. In many countries, Hib pneumonia is more common than the other types of respiratory infection, but diagnosis of Hib pneumonia is extremely difficult. Routine surveillance should concentrate on meningitis and other Hib infections, diagnosed with microbiological tests on blood, cerebrospinal fluid (CSF), and other body fluids (such as pleural fluid) that usually do not contain bacteria. Such infections are often termed "invasive Hib disease". Countries may also wish to report potential cases of bacterial meningitis, both as a performance indicator for Hib detection and to clarify the burden of meningitis attributable to all bacteria.

RECOMMENDED CASE DEFINITION

Clinical description

Bacterial meningitis is characterized by fever of acute onset, headache and stiff neck. Meningitis is not a specific sign for Hib disease, and Hib disease cannot be diagnosed on clinical grounds.

Laboratory criteria for diagnosis

Culture: isolation of Hib from a normally sterile clinical specimen, such as cerebrospinal fluid (CSF) or blood. Culture of Hib from non-sterile sites such as the throat, where bacteria can grow without causing disease, does not define Hib disease.

Antigen detection: identification of Hib antigen in normally sterile fluids, by methods such as latex agglutination or counter-immunoelectrophoresis (CIE).

Case classification

Potential: (bacterial meningitis case): a child with a clinical syndrome consistent with bacterial meningitis.

Probable: Not applicable.

Confirmed: A case that is laboratory-confirmed (growth or identification of Hib in CSF or blood).

Note: Any person with Hib isolated from CSF or blood may be reported as a confirmed case, regardless of whether their clinical syndrome was meningitis.

RECOMMENDED TYPES OF SURVEILLANCE

- Routine monthly reporting of aggregated data of confirmed cases is recommended from peripheral level to intermediate and central levels
- Zero reporting must be required at all levels
- All potential cases should also be reported if laboratory performance indicators are to be monitored*

* Laboratory confirmation is required for all cases, and the extent of surveillance will vary depending on the capabilities of individual countries. Surveillance does not need to be national in scope to fulfil goals (see "Rationale" section). It is more important to have a well-functioning system in some areas than to have a nation-wide system that functions poorly.

RECOMMENDED MINIMUM DATA ELEMENTS

Aggregated data for reporting

- Number of cases
- Number of 3rd doses of Hib vaccine (Hib3) administered to infants

CASE-BASED DATA FOR REPORTING AND INVESTIGATION

- Unique identifier
- Geographical area (e.g., district and province) names
- Date of birth
- Date of onset
- Specimen type, if specimen collected: 1=blood; 2=CSF; 3=both; 4=other
- Culture result, if done: 1=positive; 2=negative; 3=pending; 4=not done
- Antigen detection result, if done: 1=positive; 2=negative; 3=pending; 4=not done
- CSF white cell count/ml, if done
- Outcome: 1=alive; 2=dead; 9=unknown
- Number of Hib doses received: 9=unknown
- Final classification: 1=potential; 2=confirmed

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Aggregated data

- Incidence rate by year and geographic area
- Hib3 coverage by year and geographic area
- Completeness and timeliness of reporting

Case-based data

Same as aggregated, plus:

- Age-specific incidence rate
- Case-fatality rate
- Cases by immunization status

Performance indicators of surveillance quality	***target***
% of potential bacterial meningitis cases in which CSF / blood was obtained	$\geq$ 90%
% potential bacterial meningitis cases w/bacterial pathogen identified from CSF / blood:	
• Among CSF with 10 or more white blood cells/ml	$\geq$ 20%
• Among CSF with 100 or more white blood cells/m	$\geq$ 50%

Although persons with bacterial meningitis have a wide range of CSF white blood cell counts, potential bacterial meningitis cases with identifiable bacterial causes are more common in cases with increasing CSF cell counts. For evaluation of performance, programme personnel may wish to determine the proportion of potential bacterial meningitis cases in which bacterial causes have been identified in one or both of the above categories. Results below the target levels suggest some cases of bacterial meningitis are not being identified – review of laboratory / clinical practices required.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Determine incidence of Hib meningitis and invasive disease to estimate burden of Hib disease
- Measure impact of immunization programme / identify areas needing more input
- Monitor coverage and take action to correct low coverage areas

SPECIAL ASPECTS

Surveillance requires laboratory confirmation, and nation-wide surveillance may not be practical in many countries. Surveillance in areas with appropriate clinical and laboratory capacity can provide information on the impact of both disease and immunization. A combination of nation-wide immunization coverage data and area-specific disease data can provide information for decisions on immunization programmes. For further guidance on surveillance methods, see document WHO/VRD/GEN/95.05 *Generic protocol for population-based surveillance of Haemophilus influenzae* type *b.*

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B15-B17 *Acute viral hepatitis*

RATIONALE FOR SURVEILLANCE

Estimates suggest that worldwide, there are 385 million carriers of hepatitis B virus and 170 million carriers of hepatitis C virus. More than 1 million deaths each year are attributable to hepatitis B. Transmission is mainly oral-faecal for hepatitis A and E, percutaneous for hepatitis B, C, and D and sexual for hepatitis B. The course of the disease may be fulminating (e.g., hepatitis E in pregnancy); chronic infection and severe sequelae occur for hepatitis B, C, and D. Control measures include transfusion safety, safe and appropriate use of injections and (for hepatitis A and hepatitis B) immunization. Hepatitis B is targeted by WHO (9GPW6.3) for reduced incidence/prevalence.

RECOMMENDED CASE DEFINITION

Clinical description

Acute illness typically including acute jaundice, dark urine, anorexia, malaise, extreme fatigue, and right upper quadrant tenderness. Biological signs include increased urine urobilonogen and >2.5 times the upper limit of serum alanine aminotransferase.

Note: Most infections occur in early childhood. A variable proportion of adult infections is asymptomatic.

Laboratory criteria for diagnosis

Hepatitis A: IgM anti-HAV positive

Hepatitis B: +ve for Hepatitis B surface antigen (HbsAg) **or** IgM anti-HBc-positive

Non-A, non-B: IgM anti-HAV and IgM anti-HBc (or HBsAg) negative

Note 1: The anti-HBc IgM test, specific for acute infection, is not available in most countries. HbsAg, often available, cannot distinguish between acute new infections and exacerbations of chronic hepatitis B, although continued HBsAg seropositivity (>6 months) is an indicator of chronic infection.

Note 2: For patients negative for hepatitis A or B, further testing for a diagnosis of acute hepatitis C, D, or E is recommended:

Hepatitis C: anti-HCV positive

Hepatitis D: HbsAg positive **or**
IgM anti-HBc positive plus anti-HDV positive (only as co-infection or super-infection of hepatitis B)

Hepatitis E: IgM anti-HEV positive

Case classification

Suspected: A case that is compatible with the clinical description.

Probable: Not applicable.

Confirmed: A suspected case that is laboratory confirmed **or**, *for hepatitis A only*, a case compatible with the clinical description, in a person who has an epidemiological link with a laboratory-confirmed case of hepatitis A (i.e. household or sexual contact with an infected person during the 15-50 days before the onset of symptoms).

RECOMMENDED TYPES OF SURVEILLANCE

- Routine monthly reporting of aggregated data of suspected cases, and if available, the number of confirmed cases of each type of hepatitis, from the peripheral level to intermediate and central levels
- Zero reporting required at all levels
- When countrywide surveillance is not possible, surveillance in sentinel areas or hospitals may provide useful information on potential sources of infection.

All outbreaks should be investigated immediately and confirmed serologically.

RECOMMENDED MINIMUM DATA ELEMENTS

Aggregated data

- Number of third doses of hepatitis B vaccine (HepB3) administered to infants
- Number of injections received in the 6 weeks to 6 months preceding symptoms of acute hepatitis (whatever the etiology)
- Number of suspect cases
- If available, number of confirmed cases for each type of hepatitis

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS : (from multiple sources, in addition to surveillance data)

- HepB3 coverage in infants by year and geographic area
- Incidence of acute viral hepatitis by year, month, geographical area, and (if data exist) by age group and type of virus
- Proportion of all cases of chronic liver disease, cirrhosis, and primary liver cancer that are HbsAg positive or anti-HCV positive (see Special Aspects)
- Comparing the proportion of patients who received an injection in the 6 weeks to 6 months preceding symptoms among hepatitis A and hepatitis B cases helps to estimate the proportion of hepatitis B virus infections that are attributable to injections

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Monitor HepB3 immunization coverage by geographic area to measure areas with weak performance and take action
- Investigate all suspected / reported outbreaks
- Determine the specific cause of acute viral hepatitis cases (reported routinely or during outbreaks), so that corrective measures can be taken
- Evaluate the effectiveness of injection safety programmes
- Measure the proportion of acute viral hepatitis, chronic liver disease, cirrhosis, and primary liver cancer that are hepatitis B virus or hepatitis C virus carriers to:
- Determine the burden of the disease in the population
- Prioritize among other diseases of public health importance; and
- Choose the proper strategies for control

SPECIAL ASPECTS

Accurate differential diagnosis of viral hepatitis types requires serological testing – unavailable in many developing countries. In developing countries where most infections occur asymptomatically, a low incidence of reported acute viral hepatitis should not be misinterpreted as a low incidence of viral hepatitis infection.

Understanding the epidemiology and impact of viral hepatitis requires enhanced surveillance and an understanding of the sequelae of hepatitis B, C and D virus infection, such as asymptomatic chronic infection, chronic hepatitis, cirrhosis, and primary liver cancer. This also requires data collection from sources not routinely used, including hospital surveillance data such as hospital discharges, and mortality (chronic hepatitis, cirrhosis, liver cancer) and cancer registers. Special sero-prevalence surveys may be needed to measure prevalence of hepatitis B and C infection in the general population and in special groups (health care workers, blood donors, pregnant women, military recruits, patients with liver disease, people on dialysis, haemophiliacs), and ethnic sub-populations.

Assessment for coverage of hepatitis B vaccine is similar to that for other vaccines. Hepatitis vaccine is given to infants (and in some industrial countries to adolescents) primarily to prevent the development of chronic liver disease and liver cancer. Serological testing to document sero-conversion in children is usually not necessary: studies show that vaccine is 85% to 100% effective in preventing chronic infection.

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B20-B24 HIV infection

RATIONALE FOR SURVEILLANCE

The surveillance of HIV infection is the best way to forecast the future impact of AIDS on national health resources. It may also allow counselling, follow-up and chemoprophylaxis when appropriate at an individual level.

RECOMMENDED CASE DEFINITION

Clinical description

There is no clinical description; the diagnosis is based on laboratory criteria.

Laboratory criteria for diagnosis

HIV positive serology (ELISA)

Confirmation by a second serological test is necessary only in settings where estimated HIV prevalence is known to be <10%.

Confirmation should be a second ELISA or simple/rapid assay based on a different antigen preparation and/or a different test principle.

Case classification

Suspected: Not applicable.

Probable: Not applicable.

Confirmed: A laboratory-confirmed case.

Note: Except for unlinked anonymous testing, serological testing should only be done in combination with *appropriate pre- and post-counselling services*. Western Blot is used for individual confirmation rather than for general HIV surveys, in countries which have the appropriate resources.

RECOMMENDED TYPES OF SURVEILLANCE

In countries where HIV prevalence is low (e.g., ≤1% among pregnant women or other groups representative of the general population) and where infections are concentrated in a few high-risk sub-groups of the population, the current trend is to monitor the scope and course of the epidemic through HIV case reporting (HIV case surveillance). This approach is currently used mainly in developed countries, where a majority of those who are HIV positive have access to testing and are actually tested.

In areas of relatively high prevalence and in developing countries, the method of preference is unlinked anonymous testing in sentinel sites. In order to monitor time trends it is necessary to ensure continuity of the same sentinel surveillance sites over time, and to ensure that within sites the same sampling scheme is used over time (periodical and standardized).

For countries with low prevalence, the sentinel sites should focus on testing of high-risk groups (patients seeking treatment for sexually transmitted diseases, users of intravenous drug use, or commercial sex workers seeking health care treatment etc.).

For countries with higher prevalence, monitoring of high risk groups should continue, and surveillance of general population groups such as pregnant women attending antenatal clinics should be carried out.

Routine yearly reporting of HIV prevalence data from each sentinel site to intermediate and to central level. Some countries report case-based data.

Other sources of data:

- Hospitals
- Antenatal clinics
- Dermatologists
- STD clinics
- Blood banks
- Army (data from army recruits)
- Special surveys
- Mortality reports

RECOMMENDED MINIMUM DATA ELEMENTS

Case-based data for reporting

- Age, sex, location, risk factors

Aggregated data for reporting

- On a yearly basis: number of cases tested by age, sex, patient group, sentinel site (where appropriate)

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

- Analysis of prevalence by age and sex and geographic area, rural/urban locations and population subgroups, risk factors
- Analysis of trends in prevalence over time, by age and sex and geographic area, rural/urban location and population subgroup
- Graphs and tables: prevalence and confidence intervals, by year, age and sex, by sentinel site, population subgroup, geographic area, rural/urban location
- Maps: prevalence levels at each sentinel site

At national level, show median value for sentinel sites, with minimum and maximum values observed.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Assess the current magnitude and current trends of the HIV/AIDS epidemic
- Project the number of AIDS cases over the next 5 years
- Identify high risk population sub-groups and/or geographic areas for intervention
- Evaluate the impact of specific interventions
- Assess impact on health services, plan health and social service activities for people with HIV/AIDS
- Increase public and political awareness of the disease

SPECIAL ASPECTS

None.

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J10, J11 *Influenza*

RATIONALE FOR SURVEILLANCE

Surveillance of influenza is essential for the early detection and evaluation of new variants or subtypes of influenza virus. The early detection and characterization of these viruses allows for timely annual updates of a vaccine that can prevent deaths and alleviate illness in vulnerable groups of the population.

RECOMMENDED CASE DEFINITION

Clinical case definition

A person with sudden onset of fever of >38°C and cough or sore throat in the absence of other diagnoses.

Laboratory criteria for diagnosis

Virus isolation: Swab or aspirate from the suspected individual, **or**
Direct detection of influenza viral antigen.

Serology: Fourfold rise in antibody titre between early and late serum.

Case classification

Suspected: A case that meets the clinical case definition.

Confirmed: A case that meets the clinical case definition and is laboratory-confirmed (used mainly in epidemiological investigation rather than surveillance).

RECOMMENDED TYPES OF SURVEILLANCE

Routine weekly (at least for the epidemic period) reporting to central level of case-based or aggregated data.

- Suspected / confirmed cases by sentinel practices (general practitioners / health institutions)
- Cases confirmed by laboratory

Other sources of data (hospitals, clinics, emergency rooms, laboratories, vital statistics offices) can also be used.

International: weekly aggregated data on confirmed cases from countries to WHO (FluNet) with information on extent of activity in the community.

RECOMMENDED MINIMUM DATA ELEMENTS

Case-based data for reporting

- Case classification (suspected / confirmed)
- Subtype of virus (if known)
- Date of onset
- Vaccination status if available

Aggregated data for reporting

- For every geographical area (country) and every week: number of cases by age groups, by subtype of virus (if known), by outcome

Case-based laboratory data

- Laboratory number, specimen date (day / month), patient age (years or months), city, state or province of origin of patient, isolation system, type, subtype, isolate designation, similarity to reference strain (Y/N), whether further identification in progress (Y/N), whether sample forwarded to WHO Collaborating Centre (Y/N).

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Graphs: Number of cases by week, by age group, by virus subtype.

Tables: Number of cases by week, by age group, by geographical area, by virus subtype, by outcome.

Maps: Number of cases by week, by geographical area, by country.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Rapid isolation and antigenic characterization of influenza viruses in order to help plan the formulation of vaccine for the following season
- Early detection of influenza epidemics in order to assist in the implementing public health control measures (vaccines have to be given before the onset of an epidemic) and in planning for the possible impact of disease on essential services
- Morbidity and mortality data to estimate the impact and costs of the outbreak

SPECIAL ASPECTS

The speedy provision of isolates to the WHO Collaborating Centres is crucial.

Laboratory surveillance is most specific and is the cornerstone of surveillance.

Sentinel surveillance (by general practitioners) on influenza-like illness is less specific but sensitive and rapid.

CONTACT

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A96.2 *Lassa fever*

RATIONALE FOR SURVEILLANCE

This severe acute viral infection has the potential to produce epidemics, and as such surveillance mechanisms to detect outbreaks and to monitor control measures are critical in affected countries.

RECOMMENDED CASE DEFINITION

Clinical description

An illness of gradual onset with one or more of the following:

malaise, fever, headache, sore throat, cough, nausea, vomiting, diarrhoea, myalgia, chest pain, hearing loss, **and**

A history of contact with excreta of rodents or with a probable or confirmed case of Lassa fever.

Laboratory criteria for diagnosis

- Isolation of virus *(only in laboratory of biosafety level 4)* from blood, urine or throat washings **or**
- Positive IgM serology or seroconversion (IgG antibody) in paired serum specimens **or**
- Demonstration of Lassa virus antigen in autopsy tissues by immunohistochemistry or in serum by ELISA
- Positive PCR from serum or autopsy tissues

Case classification

Suspected: A case compatible with the clinical description.

Probable: A suspected case that is epidemiologically linked to a confirmed case.

Confirmed: A suspected case that is laboratory-confirmed.

Contact: A person having close personal contact with the patient (living with, caring for) or a person testing the laboratory specimens of a patient in the 3 weeks after the onset of the illness.

RECOMMENDED TYPES OF SURVEILLANCE

Endemic situation:

Immediate reporting of case-based data of suspected, probable or confirmed cases from peripheral level to intermediate and central levels.

All cases must be investigated, and contact tracing undertaken.

Routine monthly reporting of aggregated data from intermediate to central level.

Outbreak situation:

All suspected outbreaks must be reported centrally. Surveillance must be intensified with active case finding and contact tracing. Aggregated data on a daily / weekly basis to be submitted to intermediate and central level by investigation team.

The disease is endemic in Sierra Leone, Liberia, Guinea and regions of Nigeria. Outside these areas, compatible symptoms, with a history of travel to or arrival from one of these countries, should prompt investigation and reporting.

RECOMMENDED MINIMUM DATA ELEMENTS

Case-based data for reporting and investigation

- Case classification (suspected / probable / confirmed)
- Unique identifier, age, sex, place of residence for the three weeks before onset of illness
- Date of onset
- Hospitalization
- Outcome

Aggregated data for reporting

Endemic situation

- Number of cases (suspect / probable / confirmed) by geographical area and by outcome
- Contacts by geographical area, success of tracing and outcome

Outbreak situation

- Total number of cases by village, geographical area, onset date, hospitalization, outcome
- New cases and contacts identified since last report
- Total number of contacts by outcome
- New contacts identified and traced since last report

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

- Mapping number of cases by geographical area
- Percentage of contacts followed up
- Case-fatality rate

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Monitoring endemic disease over time
- Identification of risk groups or areas
- Identification of clusters / outbreaks
- Investigation of cases, contacts and source of infection

SPECIAL ASPECTS

Extreme biohazard is associated with sample collection and transport and with laboratory investigations.

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A48.1 *Legionellosis*

(Legionnaires' disease, Legionnaires' pneumonia)

RATIONALE FOR SURVEILLANCE

Legionnaires' disease is a disease with epidemic potential and high case-fatality. Surveillance is important in order to detect epidemics and to institute appropriate investigations and control measures. In addition, the surveillance of sporadic disease may provide clues as regards source of disease and prevention.

RECOMMENDED CASE DEFINITION

Clinical description

An illness characterized by an acute lower respiratory infection with focal signs of pneumonia on clinical examination and/or radiological evidence of pneumonia.

Laboratory criteria for diagnosis

Presumptive: one or more of the following:

- Detection of specific legionella antigen in respiratory secretions or urine
- Direct fluorescent antibody (DFA) staining of the organism in respiratory secretions or lung tissue, using evaluated monoclonal reagents
- A fourfold or greater rise in specific serum antibody titre to legionella species other than *Legionella pneumophila* serogroup 1, using a locally validated serological test

Confirmative: one or more of the following:

- Isolation of *Legionella* from respiratory secretions, lung tissue, pleural fluid, or blood
- A fourfold or greater rise in specific serum antibody titre to *L.pneumophila* serogroup 1 by indirect immunofluorescence antibody test or microagglutination

Note: Most European countries and others such as the United States now include the detection of *L. pneumophila* serogroup 1 antigen in urine as a confirmatory test.

Case classification

Suspected: Not applicable.

Probable: A case compatible with the clinical description, with presumptive laboratory results.

Confirmed: A case compatible with the clinical description, with confirmative laboratory results.

RECOMMENDED TYPES OF SURVEILLANCE

Immediate reporting of case-based data from periphery to intermediate and central levels.

The identification of cases should prompt immediate investigation for risk factors and other cases. For a rapid response, active case finding is preferred.

International: Since travel and stays in hotels are important risk factors, effective international surveillance is essential to identify and control the point source of infections.

Legionella infection is usually diagnosed after the patient's return to the country of residence and is therefore likely to be considered as a sporadic, single case.

A surveillance scheme such as the European Working Group for Legionella Infections* (see Special Aspects) allows for the detection of clusters of cases (≥2 cases) with the same source of transmission, as case notifications from different European countries are collected in the same database.

RECOMMENDED MINIMUM DATA ELEMENTS

Case-based data for investigation and reporting

- Unique identifier, name, age, sex, geographical information, date of onset, outcome
- Underlying risk factors (e.g., immunocompromised patient, AIDS)
- Exposure risk factors (hospitalizations, hotels, or other accommodation and travel history during the 2 weeks before the onset)
- Laboratory data (specimen type, date collected, *Legionella* spp. isolated)

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

- Review data regularly to look for clusters of cases in time, place or person (this should be undertaken at all levels)
- Incidence of infection by month, geographical area, age group, risk factors, exposure factors

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Detect clusters / outbreaks
- Identify high risk areas and exposures
- Monitor impact of environmental control measures

SPECIAL ASPECTS

There are 2 currently recognized distinct clinicoepidemiological manifestations of legionellosis:

- "Legionnaires' disease" (pneumonic form) and
- "Pontiac fever"(non-pneumonic Legionnaires' disease)

Both are characterized initially by anorexia, vomiting, myalgia and headache, followed within a day by rising fevers and chills.

In the pneumonic form, non-productive cough, abdominal pain / diarrhoea, confusion / delirium are common. It is not possible, clinically, to distinguish *Legionella* pneumonia from other pneumonias; suspicion should be raised in any pneumonia connected with epidemiological information (e.g., recent travelling, hospitalization, gatherings, immunosuppression). In addition, age (>50), sex (M), smoking, alcohol consumption have been shown to be risk factors.

Pontiac fever is not associated with pneumonia. It is thought to represent a reaction to inhaled antigen, rather than to bacteria.

The reservoir of *Legionella* spp. is probably primarily aqueous (e.g., hot water systems, air-conditioning, cooling towers and evaporative condensers). Environmental surveillance for Legionella in water sources can be undertaken usually as part of registration and licensing procedures. In any event, environmental surveillance should be undertaken for known sources of outbreaks, to ensure that the organism is eradicated.

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B55.1, B55.2 *Cutaneous leishmaniasis*

RATIONALE FOR SURVEILLANCE

Cutaneous leishmaniasis is endemic in over 70 countries. The yearly incidence is estimated at 1 500 000 cases. The disease has several clinical forms: localized cutaneous leishmaniasis, diffuse cutaneous leishmaniasis, the most difficult to treat, and (in the western hemisphere mainly) mucocutaneous leishmaniasis, which is the most severe form as it produces disfiguring lesions and mutilations of the face. In foci where man is believed to be the sole reservoir (anthroponotic foci), epidemics are linked to human migrations from rural to poor suburban areas; in zoonotic foci, where mammals are the reservoirs, epidemics are related to environmental changes and movement of non-immune people to rural areas.

Surveillance is essential to establish disease impact and to monitor efforts towards the control of disease and the detection of epidemics.

RECOMMENDED CASE DEFINITION

Clinical description

Appearance of one or more lesions, typically on uncovered parts of the body. The face, neck, arms and legs are the most common sites. At the site of inoculation a nodule appears, and may enlarge to become an indolent ulcer. The sore remains in this stage for a variable time before healing, and typically leaves a depressed scar. Other atypical forms may occur. In some individuals, certain strains can disseminate and cause mucosal lesions. These sequelae involve nasopharyngeal tissues and can be very disfiguring.

Laboratory criteria for diagnosis

- positive parasitology (stained smear or culture from the lesion)
- mucocutaneous leishmaniasis only: positive serology (IFA, ELISA)

Case classification

WHO operational definition:

A case of cutaneous leishmaniasis is a person showing clinical signs (skin or mucosal lesions) with parasitological confirmation of the diagnosis (positive smear or culture) and/or, for mucocutaneous leishmaniasis only, serological diagnosis.

RECOMMENDED TYPES OF SURVEILLANCE

At peripheral level individual patient records must be retained for investigation and case management.

Routine monthly reporting of aggregated data of cases from periphery to intermediate and central level.

Active case finding through surveys of selected groups or mass surveys (standardized and periodical) is an alternative to estimate the prevalence of cutaneous leishmaniasis.

International: Annual reporting from central level to WHO (limited number of countries).

RECOMMENDED MINIMUM DATA ELEMENTS

Individual patient records at peripheral level

Leishmaniasis data: clinical features, date of diagnosis, parasitological (Mucocutaneous leishmaniasis only) and serological diagnosis, *Leishmania* species, treatment outcome.

Identification data: unique identifier, age, sex, geographical information, past travels, duration of stay at current residence.

Aggregated data for reporting

Number of cases by age, sex, type of diagnosis.

RECOMMENDED DATA ANALYSIS, PRESENTATION, REPORTS

Tables: Incidence by geographical area, by age, by sex, by type of diagnosis, by month / year.
Point prevalence (if active case detection).

Maps: Incidence by village.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Evaluate the real extent of the problem and the main populations at risk
- Improve and focus the control activities
- Improve management and follow-up of cutaneous leishmaniasis, disseminated cutaneous leishmaniasias and mucocutaneous leishmaniasis patients (WHO guidelines)
- Identify technical and operational difficulties
- Evaluate impact of control interventions
- Anticipate epidemics

SPECIAL ASPECTS

The prevalence of cutaneous leishmaniasis tends to be grossly underestimated because most of the official data are obtained through passive case detection only. Other factors that may lead to misdiagnosis or non-diagnosis are: wide scatter of foci, limited access to medical facilities, scarcity of diagnostic facilities and limited or irregular availability of first-line drugs.

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Leishmania / HIV co-infections

RATIONALE FOR SURVEILLANCE

Leishmania/HIV co-infections have already been reported from 30 countries. The overlap of visceral leishmaniasis (VL) and AIDS is on the increase because the AIDS pandemic is spreading in rural areas and visceral leishmaniasis in suburban areas. In southern Europe, 25% to 70 % of adult cases of visceral leishmaniasis are related to HIV infection and 1.5% to 9% of AIDS cases suffer from newly acquired or reactivated visceral leishmaniasis.

RECOMMENDED CASE DEFINITION

WHO operational definition:

A case of co-infection is a HIV positive person showing clinical signs of leishmaniasis (visceral or cutaneous) with parasitological confirmation of the diagnosis.

RECOMMENDED TYPES OF SURVEILLANCE

Sentinel surveillance: This can be hospital-based and/or based on laboratories.

At peripheral level, hospitals and laboratories, members of the network of surveillance (28 institutions from 13 countries at the time of writing) maintain individual patient records. They use guidelines for diagnosis; a standardized case report form has recently been computerized.

Routine aggregated or case-based data of all cases reported every six months from peripheral level or central level to WHO.

Worldwide information collected, processed and rediffused (twice per year) by the central registry set up at WHO.

RECOMMENDED MINIMUM DATA ELEMENTS

Case-based data (individual patient record at peripheral level, and reporting)

Identification data:	Unique identifier, age, sex, geographical information, travel history, duration of stay at current residence.
Leishmaniasis data:	Date of diagnosis, serological and parasitological diagnosis, *Leishmania* species, clinical features.
HIV data (as available):	Date of diagnosis, serology, CD4/mm^3, risk groups, AIDS-defining diseases, viral load; treatment outcome.

Aggregated data

Number of cases by age, sex, type of diagnosis, risk group.

RECOMMENDED DATA ANALYSIS, PRESENTATION, REPORTS

Geographic distribution, sex distribution, age distribution, risk groups, main risk groups by country, date of HIV diagnosis, date of leishmaniasis diagnosis, correlation between leishmaniasis and HIV diagnosis, immunological parameters, parasitological diagnosis, clinical diagnosis stage, clinical features and AIDS-defining diseases.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Evaluate the real extent of the problem and the main population at risk
- Improve the management and follow-up of co-infected patients (guidelines)
- Identify technical and operational difficulties faced by the network of institutions
- Evaluate the impact of intervention

SPECIAL ASPECTS

A network helps improve:

- the reliability of data collection by the use of the standardized case report form
- coordination between the institutions
- the active medical surveillance of the main population at risk

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B55.0 *Visceral leishmaniasis*

RATIONALE FOR SURVEILLANCE:

Visceral leishmaniasis is endemic in over 60 countries. The incidence is estimated at 500 000 cases each year. It is the most severe form of leishmaniasis and it can be fatal in the absence of treatment. Deadly epidemics frequently occur in the anthroponotic foci of Bangladesh, India, Nepal and Sudan, where humans are believed to be the sole reservoir. Surveillance is essential in establishing disease impact and monitoring efforts towards disease control and detecting epidemics.

RECOMMENDED CASE DEFINITION

Clinical description

An illness with prolonged irregular fever, splenomegaly and weight loss as its main symptoms.

Laboratory criteria for diagnosis

- positive parasitology (stained smears from bone marrow, spleen, liver, lymph node, blood or culture of the organism from a biopsy or aspirated material)
- positive serology (IFA, ELISA)

Case classification

WHO operational definition:

A case of visceral leishmaniasis is a person showing clinical signs (mainly prolonged irregular fever, splenomegaly and weight loss) with serological (at geographical area level) and/or parasitological confirmation (when feasible at central level) of the diagnosis. In endemic malarious areas, visceral leishmaniasis should be suspected when fever lasts for more than two weeks and no response has been achieved with anti-malaria drugs (assuming drug-resistant malaria has also been considered).

RECOMMENDED TYPES OF SURVEILLANCE

Routine monthly reporting of aggregated data from periphery to intermediate and central level.

Active case finding through surveys of selected groups or mass surveys (standardized and periodical) is an alternative to estimate the prevalence of visceral leishmaniasis.

International: Annual reporting from central level to WHO (limited number of countries).

RECOMMENDED MINIMUM DATA ELEMENTS

Individual patient records at peripheral level

Identification data:	Unique identifier, age, sex, geographical information, travel history, duration of stay at current residence.
Leishmaniasis data:	Clinical features, date of diagnosis, serological/parasitological diagnosis, *Leishmania* species, treatment outcome.

Aggregated data for reporting

Number of cases by age, sex, type of diagnosis.

RECOMMENDED DATA ANALYSIS, PRESENTATION, REPORTS

Tables: Incidence by geographical area, age, sex, type of diagnosis, risk group, by clinical features, by month/year.

Point prevalence (if active case detection).

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Evaluate the real extent of the problem and the main populations at risk
- Improve and focus the control activities
- Identify technical and operational difficulties
- Evaluate impact of control interventions
- Anticipate epidemics

SPECIAL ASPECTS

Visceral leishmaniasis tends to be largely underreported because most of the official data are obtained through passive case detection only. The number of people exposed to infection or infected without any symptoms is much more important than the number of detected cases.

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A30 *Leprosy*
(Hansen's Disease)

RATIONALE FOR SURVEILLANCE

Leprosy continues to affect a large number of people. In 1997 there were an estimated 1.5 million cases in the world. Control of the disease has improved with the introduction of multidrug therapy (MDT). WHO (9GPW6.2) has targeted the disease for **elimination** (<1 case/10 000 population) by the year 2000, using a focused flexible approach. This includes making multidrug therapy available to all communities and areas, appropriate and good quality diagnosis and treatment, with evaluation through epidemiological surveillance and programme monitoring.

RECOMMENDED CASE DEFINITION

Clinical description

The clinical manifestations of the disease vary in a continuous spectrum between the two polar forms, lepromatous and tuberculoid leprosy:

- In lepromatous (multibacillary) leprosy, nodules, papules, macules and diffuse infiltrations are bilateral symmetrical and usually numerous and extensive; involvement of the nasal mucosa may lead to crusting, obstructed breathing and epistaxis; ocular involvement leads to iritis and keratitis
- In tuberculoid (paucibacillary) leprosy, skin lesions are single or few, sharply demarcated, anaesthesic or hypoaesthesic, and bilateral asymmetrical, involvement of peripheral nerves tends to be severe
- Borderline leprosy has features of both polar forms and is more labile
- Indeterminate leprosy is characterized by hypopigmented maculae with ill-defined borders; if untreated, it may progress to tuberculoid, borderline or lepromatous disease

Laboratory criteria for confirmation

Alcohol-acid-fast bacilli in skin smears (made by the scrape-incision method).

In the paucibacillary form the bacilli may be so few that they are not demonstrable. In view of the increasing prevalence of HIV and hepatitis B infection in many countries where leprosy remains endemic, the number of skin smear sites and the frequency of smear collection should be limited to the minimum necessary.

Case classification

WHO operational definition*:*

A case of leprosy is defined as a person showing one or more of the following features, and who as yet has to complete a full course of treatment:

- hypopigmented or reddish skin lesions with definite loss of sensation
- involvement of the peripheral nerves, as demonstrated by definite thickening with loss of sensation
- skin smear positive for acid-fast bacilli

Classification (microbiological)*:*

Paucibacillary (PB): includes all smear-negative cases

Multibacillary (MB): includes all smear-positive cases.

Classification (clinical):

Paucibacillary single lesion leprosy: 1 skin lesion.

Paucibacillary leprosy: 2 to 5 patches or lesions on the skin.

Multibacillary leprosy: >5 patches or lesions on the skin.

RECOMMENDED TYPES OF SURVEILLANCE

Individual patient records at peripheral level for investigation and case management.

Routine monthly reporting of aggregated data of all cases from periphery to intermediate level and from intermediate to central level.

International: Quarterly and annual reporting of aggregated data from central level to WHO.

RECOMMENDED MINIMUM DATA ELEMENTS

Individual patient records

Unique identifier, name, sex, age, geographical information, disability grade, laboratory examination, disease classification (multi- or paucibacillary, see case definition), date treatment commenced, treatment outcome (disability, cured, dropout), contacts.

Aggregated data for reporting – essential indicators (endemic countries)

- Number of cases registered for treatment at a given time (usually end of year)
- Number of newly detected cases by type of leprosy
- Number of cases treated with multidrug therapy (MDT)
- Number of WHO grade 2 disability* among new cases
- Number of patients cured with MDT
- Number of relapses

*See: *WHO technical Reports Series N°874*, Geneva: World Health Organization, 1988: 31-32

Multidrug treatment (MDT) indicators (see Special Aspects)

MDT supply indicators:

For MB adult cases, MB child cases, PB adult cases, PB child cases:

- Number of patients under treatment
- Blister pack utilization (%)

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Point prevalence, annual detection, MDT coverage, number of patients cured (wherever possible based on cohort reporting), number of cases registered for chemotherapy at the end of the year divided by the population in which the cases have occurred.

Graphs: Prevalence by year, detection by year, number of patients on multidrug therapy (MDT) by year, number of patients cured on MDT by year.

Maps: Number of registered cases, number of new cases, type of treatment, MDT coverage all by geographical area.

Tables: Prevalence, new case detection, percentage of children, percentage of disabled, percentage multibacillary, number cured with MDT.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Assess the magnitude of the problem
- Identify variations in case detection
- Evaluate the policy of elimination of leprosy
- Plan the distribution of drugs
- Identify technical and operational difficulties faced by the programme
- Identify high risk areas for further targeting intervention
- Evaluate impact of intervention

SPECIAL ASPECTS

- Leprosy tends to be underreported. However, there are no reliable cost-effective methods to estimate the real prevalence of the disease accurately
- In endemic countries, essential indicators must be validated through independent mechanisms in order to assess performance of MDT services and progress towards the elimination of the disease at local level

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A27 *Leptospirosis*

RATIONALE FOR SURVEILLANCE

This zoonosis with worldwide distribution occurs seasonally in countries with a humid subtropical or tropical climate. It is often linked to occupation, sometimes in outbreaks. Feral and domestic animal species may serve as sources of infection with one of the *Leptospira* serovars. Infection is transmitted to humans through direct contact with (the urine of) infected animals or a urine-contaminated environment, mainly surface waters, soil and plants. The course of disease in humans ranges from mild to lethal. Leptospirosis is probably underreported in many countries because of difficult clinical diagnosis and lack of diagnostic laboratory services. Surveillance provides the basis for intervention strategies in human or veterinary public health.

RECOMMENDED CASE DEFINITION

Clinical description

Acute febrile illness with headache, myalgia and prostration associated with any of the following symptoms:

- conjunctival suffusion
- meningeal irritation
- anuria or oliguria and/or proteinuria
- jaundice
- haemorrhages (from the intestines; lung bleeding is notorious in some areas)
- cardiac arrhythmia or failure
- skin rash

and a history of exposure to infected animals or an environment contaminated with animal urine.

Other common symptoms include nausea, vomiting, abdominal pain, diarrhoea, arthralgia.

Laboratory criteria for diagnosis

- Isolation (and typing) from blood or other clinical materials through culture of pathogenic leptospires
- Positive serology, preferably Microscopic Agglutination Test (MAT), using a range of *Leptospira* strains for antigens that should be representative of local strains

Case classification

Suspected: A case that is compatible with the clinical description.

Probable: Not applicable.

Confirmed: A suspect case that is confirmed in a competent laboratory.

Note: Leptospirosis is difficult to diagnose clinically in areas where diseases with symptoms similar to those of leptospirosis occur frequently.

RECOMMENDED TYPES OF SURVEILLANCE

Immediate case-based reporting of suspected or confirmed cases from peripheral level (hospital / general practitioner / laboratory) to intermediate level. All cases must be investigated.

Routine reporting of aggregated data of confirmed cases from intermediate to central level. Hospital-based surveillance may give information on severe cases of leptospirosis. Serosurveillance may give information on whether leptospiral infections occur or not in certain areas or populations.

International: The International Leptospirosis Society* collects worldwide data:

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ILS home page: http://www.med.monash.edu.au/micro/department/adler/ilspage.htm

RECOMMENDED MINIMUM DATA ELEMENTS

Individual patient record for reporting and investigation

- Age, sex, geographical information, occupation
- Clinical symptoms (morbidity, mortality)
- Hospitalization (Y/N)
- History and place of exposure (animal contact, environment)
- Microbiological and serological data
- Date of diagnosis
- Rainfall, flooding

Aggregated data for reporting

- Number of cases
- Number of hospitalizations
- Number of deaths
- Number of cases by type (causative serovar / serogroup) of leptospirosis

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Number of cases by: age, sex, occupation, area, date of onset, causative serovars / serogroups, (presumptive) infection source, transmission conditions (graphs, tables, maps).

Frequency distribution of signs and symptoms by case and causative serovar (tables).

Reports of outbreaks, reports of preventive measures, surveillance of the human population and populations of feral and domestic animals.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Assess the magnitude of the problem in different areas and risk groups / areas / conditions
- Identify outbreaks
- Identify animal sources of infection
- Monitor for emergence of leptospirosis in new areas and new risk (occupational) groups
- Design rational control or prevention methods
- Identify new serovars and their distribution
- Inform on locally occurring serovars for a representative range in the MAT

SPECIAL ASPECTS

Serology by Microscopic Agglutination Test (MAT) may provide presumptive information on causative serogroups. Attempts should be made to isolate leptospires, and isolates should be typed to assess locally circulating serovars.

Questioning the patient may provide clues to infection source and transmission conditions. Animal serology may give presumptive information on serogroup status of the infection Isolation followed by typing gives definite information on serovar.

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B50-54 *Malaria*

RATIONALE FOR SURVEILLANCE

Malaria is the most highly prevalent tropical disease, with high morbidity and mortality and high economic and social impact. The *Global Strategy for Malaria Control* is discussed in the 9GPW. Its 4 elements are:

1. Provision of early diagnosis and treatment.
2. Planning and implementing selective and sustainable preventive measures, including vector control.
3. Early detection, containment and prevention of epidemics.
4. Strengthening local capacities in basic and applied research to permit and promote the regular assessment of a country's malaria situation, in particular the ecological, social and economic determinants of the disease.

For this, surveillance is essential.

RECOMMENDED CASE DEFINITION

(For use in endemic areas and people exposed to malaria, e.g., a history of visit to endemic area). Malaria must be defined in association with clinical disease symptoms. The case definition for malaria cannot be uniform: it will vary according to how malaria is perceived in a given country, local patterns of transmission, and disease consequences. The suggested definitions are deliberately broad. Each national malaria control programme must adapt the definition and introduce additional indicators to make it more applicable to local epidemiology and control targets.

Clinical description

Signs and symptoms vary; most patients experience fever.

Splenomegaly and anaemia are commonly associated signs.

Common but non-specific symptoms include otherwise unexplained headache, back pain, chills, sweating, myalgia, nausea, vomiting.

Untreated *Plasmodium falciparum* infection can lead to coma, generalized convulsions, hyperparasitaemia, normocytic anaemia, disturbances of fluid, electrolyte, and acid-base balance, renal failure, hypoglycaemia, hyperpyrexia, haemoglobinuria, circulatory collapse / shock, spontaneous bleeding (disseminated intravascular coagulation), pulmonary oedema, and death.

Laboratory criteria for diagnosis

Demonstration of malaria parasites in blood films (mainly asexual forms).

Case classification

In areas without access to laboratory-based diagnosis.

Probable uncomplicated malaria: A person with symptoms and/or signs of malaria who receives anti-malarial treatment.

Probable severe malaria*:* A patient who requires hospitalization for symptoms and signs of severe malaria and receives anti-malarial treatment.

Probable malaria death*:* death of a patient diagnosed with probable severe malaria.

In areas with access to laboratory-based diagnosis.

Asymptomatic malaria: A person with no recent history of symptoms and/or signs of malaria who shows laboratory confirmation of parasitaemia.

Confirmed uncomplicated malaria*:* A patient with symptoms and/or signs of malaria who received anti-malarial treatment, with laboratory confirmation of diagnosis.

***Confirmed severe malaria**:* A patient who requires hospitalization for symptoms and/or signs of severe malaria and receives anti-malarial treatment, with laboratory confirmation of diagnosis.

***Confirmed malaria death**:* death of a patient diagnosed with probable severe malaria, with laboratory confirmation of diagnosis.

Some Health Services record malaria patients as "suspected malaria" until the microscopic diagnosis is available, after which the patient becomes "confirmed malaria". These services must take care to avoid double counting, and must record confirmed cases as a subset of suspected cases.

"Suspected malaria death" and "confirmed malaria death" are mutually exclusive categories.

Malaria treatment failure: A patient with uncomplicated malaria without any clear symptoms suggesting another concomitant disease who has taken a correct dosage of anti-malarial treatment, and who presents with clinical deterioration or recurrence of symptoms within 14 days of the start of treatment, in combination with parasitaemia (asexual forms).

RECOMMENDED TYPES OF SURVEILLANCE

- Routine monthly reporting of aggregated data of uncomplicated malaria, severe malaria, suspected and confirmed malaria deaths, treatment failures from peripheral level to intermediate and central level
- Surveys built into the supervision and retraining process. Topics include the availability and use of anti-malarial drugs. Every 3 months aggregated data are forwarded from the peripheral level to the intermediate and central levels
- Special surveys and "sentinel site" monitoring. Topics include drug utilization studies of malaria cases treated at home and in the private sector; assessment of therapeutic efficacy of anti-malarial drugs; estimating malaria-associated deaths in the community
- Timely recognition of malaria epidemic and notification at all times

Note: The primary purpose of surveillance is to guide malaria control activities at the level where data are collected. In addition, regularly completed forms provide an important numeric picture of trends in malaria incidence and mortality in the various units that diagnose and treat malaria.

RECOMMENDED MINIMUM DATA ELEMENTS

Note: According to epidemiological circumstances, different segments of the population may be affected by malaria. Knowledge of age group, sex and pregnancy status of patients constitutes vital information. All malaria data must be reported by age group (A) and sex (S), with a separate category for pregnant women (P).

Case-based data

***From peripheral level without microscopy*:**

- uncomplicated malaria: A / S / P
- severe malaria: A / S / P, referral (Y/N)
- suspected malaria death: A / S / P
- presumptive malaria treatment failure: A / S / P, nature of treatment taken

From peripheral level with laboratory facility:

same as peripheral level without microscopy **plus**

- type of malaria parasite (P. falciparum, P. malariae, P. ovale, P. vivax)

confirmed malaria death: A / S / P

Aggregated data for reporting

From peripheral level without laboratory facility:

- number of cases of uncomplicated malaria, severe malaria, malaria treatment failures(by treatment taken), for A / S / P
- suspected malaria mortality, by A / S / P

From peripheral level with laboratory facility:

same as peripheral level without microscopy **plus**

- type of malaria
- confirmed malaria mortality, by A / S / P

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Disease trends and patterns are the principal concern of malaria control programmes.

Reports: Monthly reports of aggregated data to the next level, by geographical area (district).

Graphs: Time trends for the different geographical areas; an increase in the number of cases of more than 2 standard deviations as compared to averaged data from previous "normal" years of transmission may indicate an epidemic.

Maps: Presence / absence of malaria cases; report completeness and timeliness.

Line list: Peripheral and intermediate levels that sent no monthly report or untimely reports.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Identify high risk groups and problem areas (e.g., districts where therapeutic efficacy studies must urgently be carried out)
- Evaluate impact of control measures
- Adjust and target control measures
- Guide allocation of resources and training efforts

SPECIAL ASPECTS

Many cases may be treated at home or by private practitioners. It is a challenge for malaria control to incorporate home treatment and private practitioners in surveillance and control.

CONTACT

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B05 *Measles*

RATIONALE FOR SURVEILLANCE

Measles is targeted for a reduction by 90% for incidence and by 95% for mortality (9GPW 6.2). Surveillance for measles evolves with each phase of measles control.

Countries in the initial "measles control" phase are endemic and should concentrate on raising routine measles immunization coverage and on focusing extra immunization efforts in areas with high measles morbidity.

Countries in the more advanced "measles outbreak prevention phase" are achieving high routine measles coverage and low incidence, with periodic outbreaks. In these countries, surveillance must be used to predict potential outbreaks and identify high-risk areas and populations.

Countries in the final and most advanced "measles elimination phase", where the objective is to completely interrupt measles transmission, require very intensive case-based surveillance to detect, investigate, and confirm each and every case of measles suspected in the community.

RECOMMENDED CASE DEFINITION

Clinical case definition

Any person with:

- fever, **and**
- maculopapular (i.e. non-vesicular) rash, **and**
- cough, coryza (i.e. runny nose) or conjunctivitis (i.e. red eyes).

or

Any person in whom a clinician suspects measles infection.

Laboratory criteria for diagnosis

- At least a fourfold increase in antibody titre **or**
- Isolation of measles virus **or**
- Presence of measles-specific IgM antibodies

Case classification

Clinically confirmed:	A case that meets the clinical case definition.
Probable:	Not applicable.
Laboratory-confirmed:	*only for outbreak confirmation and during elimination phase* A case that meets the clinical case definition and that is laboratory-confirmed or linked epidemiologically to a laboratory-confirmed case.

RECOMMENDED TYPES OF SURVEILLANCE

Control phase*:* When measles is endemic, routine monthly reporting of aggregated data of clinical cases from peripheral to intermediate and central level. Only outbreaks (not each case) should be investigated.

International: Routine reporting of aggregated data according to regional specifications (geographical area, month of onset), from central level to WHO Regional Offices.

Outbreak prevention phase*:* When low incidence is achieved with periodic outbreaks due to accumulation of susceptibles, routine monthly reporting of aggregated data of clinical cases from peripheral to intermediate and central level. All suspected outbreaks should be investigated immediately and case-based data collected. Suspected epidemics must be confirmed through serology on the first few cases only.

International: Routine reporting of aggregated data according to regional specifications (geographical area, month of onset, age group, immunization status).

Elimination phase*:* Case-based surveillance should be conducted and every case reported and investigated immediately from peripheral level to intermediate level, and also included in the weekly reporting system. Laboratory specimens should be collected on every case.

International: Routine reporting of aggregated data of clinical cases according to regional specifications (area, month of onset, age group, immunization status).

Zero reporting required at all levels during each phase

RECOMMENDED MINIMUM DATA ELEMENTS

Control phase (aggregated data)

- Number of cases
- Number of measles vaccine doses administered to infants or 1 year old children (depending on immunization schedule)

Outbreak prevention phase (aggregated data):

Same as control phase, plus

- Number of cases by age group and immunization status
- % of known outbreaks that have been investigated

Elimination phase (case-based data)

- Unique identifier
- Geographical area
- Date of birth
- Date of rash onset
- Date of notification
- Date of case investigation
- Date of specimen collection
- Number of measles vaccine doses received: 99=unknown
- Source of infection identified (1=yes; 2=no; 9=unknown)
- Results of serology (1=positive; 2=negative; 3=no specimens processed; 9=unknown)
- Final classification (1=clinically confirmed; 2=confirmed by laboratory; 3=confirmed by epidemiological link; 9=discarded)

Completeness / timeliness of weekly measles reporting to be monitored in each phase

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Control phase

- Incidence rate by month, year, and geographic area
- Measles vaccine coverage by year and geographic area
- Completeness / timeliness of monthly reporting
- Proportional morbidity (compared to other diseases of public health importance)

Outbreak prevention phase

Same as control phase plus the following:

- Age-specific incidence rate
- Cases by age group and immunization status

Measles elimination phase:

Same as Outbreak prevention phase plus the following:

Performance indicators	***target***
% of weekly reports received	80%
% of cases* notified ≤ 7 days of rash onset	80%
% of cases* investigated ≤ 48 hours of notification	80%
% of cases* with adequate specimen**and lab results	80%
% of confirmed cases with source of infection identified	80%

* all cases that meet the clinical case definition

** adequate specimen is one blood specimen collected within 3-28 days of rash onset

PRINCIPAL USES OF DATA FOR DECISION-MAKING

Control phase*:* Monitor incidence and coverage to monitor progress (decreasing incidence and increasing coverage), and identify areas at high risk or with poor performance.

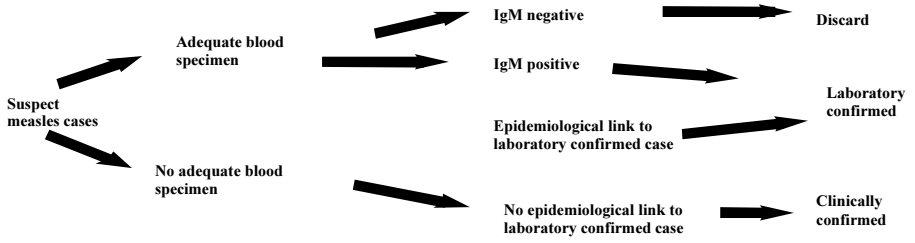
Outbreak prevention phase*:* Describe the changing epidemiology of measles in terms of age and inter-epidemic period. Identify high-risk populations. Determine when the next outbreak may occur through a build-up of susceptibles, and accelerate activities beforehand.

Elimination phase: Use data to classify cases (see Special Aspects). Determine where measles virus is circulating or may circulate (i.e. high risk) and the performance of the surveillance system (e.g., reaction time for notification, and specimen collection) to detect virus circulation or potential importation.

During all phases*:* Detect and investigate outbreaks to ensure proper case management. Determine why the outbreak occurred (failure to vaccinate, vaccine failure, accumulation of susceptibles).

SPECIAL ASPECTS REQUIRING EXPLANATION

Final classification of measles cases (Elimination phase)



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A39 *Meningococcal disease*

(Meningococcal infection A39
Meningococcal meningitis A39.0
Meningococcemia A39.4)

RATIONALE FOR SURVEILLANCE

Meningococcal disease occurs sporadically and in epidemics of meningococcal meningitis; the majority of cases occur in children <5 years. Meningococcal meningitis is the only form of meningitis to cause epidemics. The case-fatality rate is between 5% and 15%. While sub-Saharan Africa is the most severely affected area, epidemic meningococcal disease can affect any country. Meningococcal bivalent A, C and quadrivalent A, C, Y, W135 vaccines are available; immunization of the entire population should be considered to halt epidemics due to A and C serogroup meningocci. In some countries, vaccine is used for close contacts of patients with meningococcal disease due to A, C, Y or W135 serogroups in order to prevent secondary cases. Immunization is also indicated for people travelling to endemic areas. Surveillance is needed to measure and detect epidemics and establish the impact of both epidemic and non-epidemic disease.

RECOMMENDED CASE DEFINITION

Clinical case definition

An illness with sudden onset of fever (>38.5°C rectal or >38.0°C axillary) **and one or more** of the following:

- neck stiffness
- altered consciousness
- other meningeal sign **or** petechial or purpural rash

In patients <1 year, suspect meningitis when fever accompanied by bulging fontanelle.

Laboratory criteria for diagnosis

- Positive CSF antigen detection **or**
- Positive culture

Case classification

Suspected: A case that meets the clinical case definition.

Probable: A suspected case as defined above **and:**
Turbid CSF (with or without positive Gram stain) **or**
ongoing epidemic and epidemiological link to a confirmed case

Confirmed: A suspected **or** probable case with laboratory confirmation.

RECOMMENDED TYPES OF SURVEILLANCE

At peripheral level, individual patient records should be maintained (particularly for contact tracing).

Immediate reporting of all suspected or probable cases from peripheral level to intermediate level.

All cases must be investigated.

Follow-up data on the organism identified and on patient outcome to be sought by the intermediate level.

Routine weekly / monthly reporting of aggregated or case-based data, from intermediate to central level.

A parallel surveillance using reference laboratories for meningococcal diseases may provide detailed microbiological data on serogroup and genotype on a central basis (useful for epidemiological analysis).

Note 1: In countries with limited surveillance infrastructure, 2 approaches to clinical surveillance can be integrated:

A limited amount of data reported from all health sites (e.g., new cases and deaths by week).

More extensive data reported from selected referral health centres.

Note 2: Surveillance of vaccine coverage may be undertaken in areas of mass vaccination or where vaccination for meningococcal disease is part of routine vaccination.

RECOMMENDED MINIMUM DATA ELEMENTS

CLINICAL SURVEILLANCE

Case-based data for individual patient records and for reporting

- Case classification (suspected / probable / confirmed), unique identifier, age, sex, geographical information, date of onset, date of consultation, vaccination status, treatment received, history of contact with a case, close contacts

Aggregated data for reporting

- By case classification (suspected / probable / confirmed), age group, week, geographical area, and outcome

LABORATORY SURVEILLANCE

Isolate-based data for reporting

- Unique identifier, age, sex, date of onset, date of specimen, specimen type, serogroup
- Genotype

Aggregated data for reporting:

- Cases by age group, specimen type, serogroup, genotype

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

- Incidence by week, month, geographical area and age group
- Use of incidence data to set epidemic thresholds by comparing weekly incidence rates during the same period in 3-5 previous non-epidemic years (flagging)
- Distribution by serogroup and genotype (if available)
- Vaccine coverage (if available)

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Detect and control epidemics of meningococcal disease as early as possible, especially in areas such as developing countries where epidemic meningitis raises particular difficulties
- Strengthen capacity for emergency response to epidemics of meningococcal disease
- Mobilize immunization activities
- Monitor immunization coverage by geographical area to monitor progress and identify areas of poor performance
- Monitor impact of vaccination on disease incidence and vaccine efficacy during epidemics

SPECIAL ASPECTS

Deciding when an epidemic is occurring or likely to occur (setting thresholds)

Hyperendemic areas: 15 cases per 100 000 per week averaged over 2 consecutive weeks. Once epidemic disease is detected in a given area, a lower value (say 5 cases/100 000 per week) may be used as a threshold in contiguous areas.

Other situations: 3 to 4-fold increase compared with corresponding time period in previous years, **or**

Doubling of cases from one week to the next over a period of 3 weeks.

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A87 *Viral meningitis*

RATIONALE FOR SURVEILLANCE

Viral meningitis occurs sporadically and also as an epidemic disease. Case-fatality rates are generally low; infection may have potential long-term sequelae in those affected (mostly children), but the disease is rarely severe and recovery is usually complete. The early detection of epidemics through epidemiological surveillance allows for identification of the causal agent and the institution of targeted control measures and effective case management.

RECOMMENDED CASE DEFINITION

Clinical case definition

A case with fever □38.5°C **and one or more** of the following:

- neck stiffness
- severe unexplained headache
- neck pain and **2 or more** of the following
  - photophobia
  - nausea
  - vomiting
  - abdominal pain
  - pharyngitis with exudates

For **children <2 years of age** a case is defined as

- A case with fever □38.5°C **and one or more** of the following
  - irritability
  - bulging fontanelle

Laboratory criteria for confirmation

The specific virus confirmed on cell culture.

Case classification

Suspected: A case that meets the clinical case definition.

Suspected: A suspected case with one or more of the following:

- normal CSF glucose and normal or mild increase in CSF protein (>50mg/dl), moderate increase CSF cells (<500/mm^3) and lymphocyte predominance (>50%)
- CSF Positive for viral genomic sequences using PCR (Polymerase Chain Reaction)
- Epidemiological link to a confirmed case

Confirmed: A suspected or probable case with laboratory confirmation.

RECOMMENDED TYPES OF SURVEILLANCE

At peripheral level individual patient records should be maintained.

Immediate reporting of all suspected or probable cases from peripheral level to intermediate level and central level.

All cases must be investigated. Follow-up data on identified organism and patient outcome to be sought by the intermediate and central level.

Routine weekly reporting of aggregated or case-based data from intermediate to central level.

A parallel surveillance using reference laboratories for viral diseases may provide more detailed virological data on specific causal agents on a national basis; these are very useful for epidemiological analysis.

RECOMMENDED MINIMUM DATA ELEMENTS

CLINICAL SURVEILLANCE

Case-based data for individual patient record and for reporting

- Case classification (suspect / probable / confirmed), unique identifier, age, sex, geographical information, date of onset, date of consultation, treatment received

Aggregated data for reporting

- Case by case classification (suspect / probable / confirmed), age group, week, geographical area, and outcome

LABORATORY SURVEILLANCE

Isolate-based data for reporting

- Unique identifier, age, sex, date of onset, date of specimen, specimen type, organism identified

Aggregated data for reporting

- Cases by age group, specimen type, organism identified

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Incidence by week, month, geographical area, age group, outcome.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- To detect and control epidemics of viral meningitis as early as possible
- To strengthen the capacity for emergency response to epidemics of viral meningitis

SPECIAL ASPECTS

None.

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B73 *Onchocerciasis*
(River blindness)

RATIONALE FOR SURVEILLANCE

Onchocerciasis is endemic in 34 countries of Africa, the Arabian peninsula and the Americas. Success at controlling the disease in West Africa was achieved through the strategy of larviciding for vector control in order to interrupt transmission; since 1988 this has been combined with treatment by ivermectin, a safe, effective drug. The global strategy for controlling onchocerciasis is based on the yearly administration of ivermectin to affected populations. The first step is to map the endemicity of onchocerciasis in known or potentially endemic areas. The second is to implement cost-effective and sustainable ivermectin delivery, focusing on methods involving community treatment.

Once onchocerciasis is under control (as is currently the case in 11 West African countries), the risk of recrudescence must be kept to a minimum. The participating countries, during the phasing-out period 1998-2002 in West Africa, will ensure that detection and control of onchocerciasis recrudescence are routinely integrated within, and become a routine function of, national disease surveillance and control services.

RECOMMENDED CASE DEFINITION

Clinical case definition

In an endemic area, a person with fibrous nodules in subcutaneous tissues.

Laboratory criteria for confirmation

One or more of the following

- Presence of microfilariae in skin snips taken from the iliac crest
- Presence of adult worms in excised nodules
- Presence of typical ocular manifestations, such as slit-lamp observations of microfilariae in the cornea, the anterior chamber, or the vitreous body

Case classification

Suspected: A case that meets the clinical case definition.

Probable: Not applicable.

Confirmed: A suspected case that is laboratory-confirmed.

RECOMMENDED TYPES OF SURVEILLANCE

In zones where onchocerciasis is endemic:

Active case finding (skin snips, ophthalmological examination, diethylcarbamazine patch test) through surveys. Distribution of the disease can be assessed through rapid epidemiological mapping of onchocerciasis (REMO), a technique developed recently.

In the onchocerciasis-freed zones of West Africa:

Surveillance in sentinel villages:

To detect recrudescence of infection, a minimum of 260 sentinel villages in onchocerciasis-freed zones of West Africa have been kept under periodic surveillance (once every 3 years). They are located near former productive larval breeding sites and had high prevalence rates prior to beginning of control activities.

***Routine surveillance*:**

All suspected cases must be investigated locally, with routine reporting of aggregated data from peripheral level to intermediate and central level. This is not yet fully effective in all of the countries because of insufficient training of health workers.

***Migration investigation*:**

In the event that a positive case is detected in the course of epidemiological surveillance, a migration investigation is systematically carried out in order to identify the origin of infection and take appropriate action.

RECOMMENDED MINIMUM DATA ELEMENTS

Individual patient record at peripheral level

- Age, sex, place of infection, treatment (Y/N), date treatment with Ivermectin started, reason for non-treatment (non-compliance)

Aggregated data for reporting

- Prevalence and incidence by age, sex and geographical area
- Community microfilarial load (CMFL)
- Number of cases treated
- Number of cases not treated and reason for non-treatment (pregnancy, breast-feeding, other defaulting)

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Graphs: Number of cases by year, geographical area, age group.

Tables: Number of cases by year, geographical area, age group.

Maps: Number of cases by geographical area, using geographical information system (GIS).

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Eliminate onchocerciasis as a disease of public health and socioeconomic importance
- Prevent recrudescence of infection in the onchocerciasis-freed zones
- Assess effectiveness of intervention
- (In West Africa), decide on the cessation of larviciding activities

SPECIAL ASPECTS

New diagnostic tests, such as patch test with DEC (diethylcarbamazine citrate), may become suitable for use in the field.

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A37.0 Pertussis
(Whooping cough)

RATIONALE FOR SURVEILLANCE

Pertussis is a major cause of childhood morbidity and mortality. An estimated 45 million cases and 400 000 deaths occur every year; case-fatality rates in developing countries can reach 15%. High routine coverage with effective vaccine is the mainstay of prevention. Surveillance data on the disease can monitor the impact of vaccination on disease incidence, identify high risk areas and identify outbreaks.

RECOMMENDED CASE DEFINITION

Clinical case definition

A person with a cough lasting at least 2 weeks **with at least one of the following:**

- paroxysms (i.e. fits) of coughing
- inspiratory "whooping"
- post-tussive vomiting (i.e. vomiting immediately after coughing)
- without other apparent cause

Laboratory criteria for diagnosis

- Isolation of *Bordetella pertussis*, **or**
- Detection of genomic sequences by polymerase chain reaction (PCR)

Case classification

Suspected: A case that meets the clinical case definition.

Confirmed: A person with a cough that is laboratory-confirmed.

RECOMMENDED TYPES OF SURVEILLANCE

Routine monthly reporting of aggregated data of suspected and confirmed cases from peripheral level to intermediate and central level. Zero reporting required at all levels.

All outbreaks should be investigated immediately and laboratory-confirmed. During an outbreak, case-based data should be collected.

To describe the changing pertussis epidemiology in countries with low pertussis incidence (where DTP3 coverage is usually >80%), additional information of age group and immunization status should be collected. As an alternative, case-based surveillance, active surveillance, sentinel surveillance and/or occasional surveys and/or laboratory confirmation for suspected cases should be considered.

International: Aggregated data of clinical (suspected) and confirmed cases in routine surveillance reports of countries to WHO Regional Offices according to regional specifications.

RECOMMENDED MINIMUM DATA ELEMENTS

Aggregated data for reporting

- Number of cases
- Number of 3d doses of diphteria-pertussis-tetanus vaccine (DTP3) given to infants
- Completeness / timeliness of monthly reports

CASE-BASED DATA FOR INVESTIGATION AND REPORTING

- Unique identifier
- Geographical information (e.g., district and province)
- Date of birth
- Date of onset
- Total number of pertussis vaccine doses; 99=unknown
- Date of latest pertussis vaccine dose; 99=unknown
- Classification: 1=confirmed; 2=suspected; 3=discarded

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Aggregated data

- Incidence rate by month, year, and geographic area
- DTP3 coverage by year and geographic area
- Completeness / timeliness of monthly reporting
- Proportional morbidity (compared to other diseases of public health importance)

Case-based data same as aggregated data plus the following

- Age-specific incidence rate
- Immunization status of cases
- Case-fatality rate
- Proportional mortality (compared to other diseases of public health importance)

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Investigate outbreaks to understand epidemiology of pertussis in the country, why the outbreak occurred (e.g., failure to immunize, vaccine failure, accumulation of susceptibles, waning immunity), and to ensure proper case management
- Monitor case-fatality rate; if high, determine cause (e.g., poor case management, lack of antibiotics / supportive care, patients not seeking treatment in time)
- Determine age-specific incidence rate, and incidence rate by geographical area to know risk groups / areas
- Monitor incidence rate to assess impact of control efforts

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A20 *Plague* *(human)*

Case report universally required by International Health Regulations

RATIONALE FOR SURVEILLANCE

Disease endemic in many countries and often has epidemic potential. Plague is transmitted to humans through flea bites or direct exposure to respiratory droplets or infected animal tissues. Surveillance of human and animal disease is important to predict and detect epidemics and to monitor control measures.

Case report universally required by *International Health Regulations*.

RECOMMENDED CASE DEFINITION

Clinical description

Disease characterized by rapid onset of fever, chills, headache, severe malaise, prostration, **with**

- *bubonic form:* extreme painful swelling of lymph nodes (buboes)
- *pneumonic form:* cough with blood-stained sputum, chest pain, difficult breathing

Note: Both forms can progress to a *septicaemic form* with toxaemia: sepsis without evident buboes rarely occurs.

Laboratory criteria for diagnosis

- Isolation of *Yersinia pestis* in cultures from buboes, blood, CSF or sputum **or**
- Passive haemagglutination (PHA) test, demonstrating an at least fourfold change in antibody titre, specific for F1 antigen of *Y. pestis,* as determined by the haemagglutination inhibition test (HI) in paired sera.

Case classification

Suspected: A case compatible with the clinical description

May or may not be supported by laboratory finding of Gram stain negative bipolar coccobaccili in clinical material (bubo aspirate, sputum, tissue, blood).

Probable: A suspected case **with**

- Positive direct fluorescent antibody (FA) test for *Y. pestis* in clinical specimen **or**
- Passive haemagglutination test, with antibody titre of at least 1:10, specific for the F1 antigen of *Y.pestis* as determined by the haemagglutination inhibition test (HI) **or**
- Epidemiological link with a confirmed case.

Confirmed: A suspected or probable case that is laboratory-confirmed.

RECOMMENDED TYPES OF SURVEILLANCE

In all situations: Immediate case-based reporting of suspected cases from peripheral level to intermediate and central level. Laboratory-based reporting of all confirmed cases required in all situations.

During an outbreak: Intensified surveillance: active case-finding and contact-tracing should be undertaken in order that treatment start for cases and contacts; targeting environmental measures; community education. A daily report of the number of cases and contacts as well as their treatment status and vital status must be produced. A weekly report must summarize the outbreak situation, the control measures taken, and those planned to interrupt the outbreak.

International: Mandatory reporting of all suspected and confirmed cases to WHO within 24 hours.

RECOMMENDED MINIMUM DATA ELEMENTS

Case-based data at peripheral level for investigation and reporting

- Case classification (suspected / probable / confirmed), unique identifier, name, geographical information, age, sex, clinical syndrome, history of contact with rodents, presence of flea bites, household or face-to-face contacts for previous seven days, names and geographical location of contacts

Case-based data at central and regional level

- Case classification(suspected / probable / confirmed)
- Unique identifier, age, sex, geographical area, number of contacts identified, number of contacts treated

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Cases by week / month, geographical area, age, sex.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Detect trends in sporadic and endemic disease patterns
- Identify high risk areas
- Give early warning of outbreak
- Detect clusters of cases and outbreaks
- Confirm the impact of control measures and the end of an outbreak

SPECIAL ASPECTS

Epizootic surveillance:

- Periodical surveys of rodent populations and of their fleas, and monitoring of plague activity in these populations; this alerts public health authorities to increased human plague risks, thus allowing prevention and control measures to be implemented before human cases occur
- Serological surveillance of wild carnivore and outdoor-ranging dog and cat populations is recommended in zones surrounding endemic ones
- Ports close to endemic areas should be placed under surveillance and require periodic sanitation to prevent increases in rodent populations.

Countries with endemic areas must have a risk assessment policy for every new development work that could affect local ecology (e.g., roads, dams, agriculture)

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A36 *Poliomyelitis*

RATIONALE FOR SURVEILLANCE

Targeted for **eradication** (9GPW 6.1). Highly sensitive surveillance for acute flaccid paralysis (AFP), including immediate case investigation; specimen collection is critical to detect wild poliovirus circulating in every infected geographical area with the ultimate objective of poliomyelitis eradication.

RECOMMENDED CASE DEFINITION

Clinical case definition

Any child under fifteen years of age with acute, flaccid paralysis* or any person with paralytic illness at any age when poliomyelitis is suspected.

*Including Guillain Barré syndrome

Case classification

Suspected case: A case that meets the clinical case definition.

Confirmed case: See diagram in "Special Aspects".

RECOMMENDED TYPES OF SURVEILLANCE

Aggregated data of AFP cases to be included in routine monthly surveillance reports.

Zero reporting required at all levels.

AFP cases (possible poliomyelitis cases) must be reported immediately, be investigated within 48 hours (case-based data), and stool specimens must be collected within 14 days of paralysis onset.

All outbreaks should be investigated immediately.

Active surveillance must be implemented in selected hospitals (also called “sentinel hospitals”).

RECOMMENDED MINIMUM DATA ELEMENTS

Aggregated data

- Number of third doses of oral poliomyelitis vaccine (OPV3) administered to infants
- Number of AFP cases

Case-based data (to be linked to specimen-based data for analysis)

- Unique identifier
- Geographical area (district and province) name
- Date of birth
- Date of onset of paralysis
- Date of notification
- Date of case investigation
- Total poliomyelitis vaccine doses received, 99=unknownf
- Fever at onset of paralysis(1=yes; 2=no; 9=unknown)
- Progression of paralysis within 4 days(1=yes; 2=no; 9=unknown)
- Asymmetric paralysis(1=yes; 2=no; 3=unknown)
- Date of 60-day follow-up examination
- Findings at 60-day follow-up (1=residual weakness; 2=no residual weakness; 3=lost to follow-up; 4=death before follow-up)
- Final classification(1=confirmed; 2=compatible; 3=discarded; 4=vaccine-associated)

Specimen-based data (to be linked to case-based data for analysis)

- Unique identifier
- Specimen number (1=first; 2=second; 3=other; 9=unknown)
- Date of paralysis onset
- Date of last OPV
- Date of stool specimen collection
- Date stool specimen sent to laboratory
- Date specimen received in laboratory
- Condition of stool(1=good; 2=poor; 9=unknown)
- Date final culture results sent from laboratory to EPI
- Date intra-typic differentiation results sent from laboratory to EPI

RESULTS

- Poliomyelitis type 1 isolated? (1=yes, wild; 2=yes, Sabin; 3= yes, pending intratypic differentiation; 4=yes, wild and Sabin mixed; 5= no P1 isolate; 6=specimen not processed)
- Poliomyelitis type 2 isolated?
- Poliomyelitis type 3 isolated? (1=yes, wild; 2=yes, Sabin; 3= yes, pending intratypic differentiation; 4=yes, wild and Sabin mixed; 5= no P2 isolate; 6=specimen not processed)
- Non-poliomyelitis enterovirus (NPEV) isolated? (1=yes; 2=none; 3=specimen not processed)

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Aggregated data

- Cases by month, year, and geographic area
- OPV3 coverage by year and geographic area
- Completeness / timeliness of monthly reporting

Case-based data: same as aggregated data plus the following

- Confirmed cases by age group, immunization status, geographic area, month and year
- Confirmed cases from which wild poliovirus was isolated
- Cases with wild poliovirus by geographic area
- Compatible cases by geographic area
- All suspect cases by final classification
- Non-poliomyelitis enterovirus isolation rate

Performance indicators of surveillance quality	***target***
• % of all expected monthly reports that were received	≥ 90%
• Annualized non-poliomyelitis AFP rate at least 1/100 000 children ≤15 years	
• % of AFP cases investigated within 48 hours	≥ 80%
• % of AFP cases with 2 stool specimens collected ≤14 days of onset and ≥24 hours apart	≥ 80%
• % of specimens arriving at the laboratory in “good” condition	≥ 80%
• % of specimens arriving at WHO-accredited laboratory within 3 days	≥ 80%
• % of laboratory results sent within 28 days of specimen receipt	≥ 80%

PRINCIPAL USES OF DATA FOR DECISION-MAKING

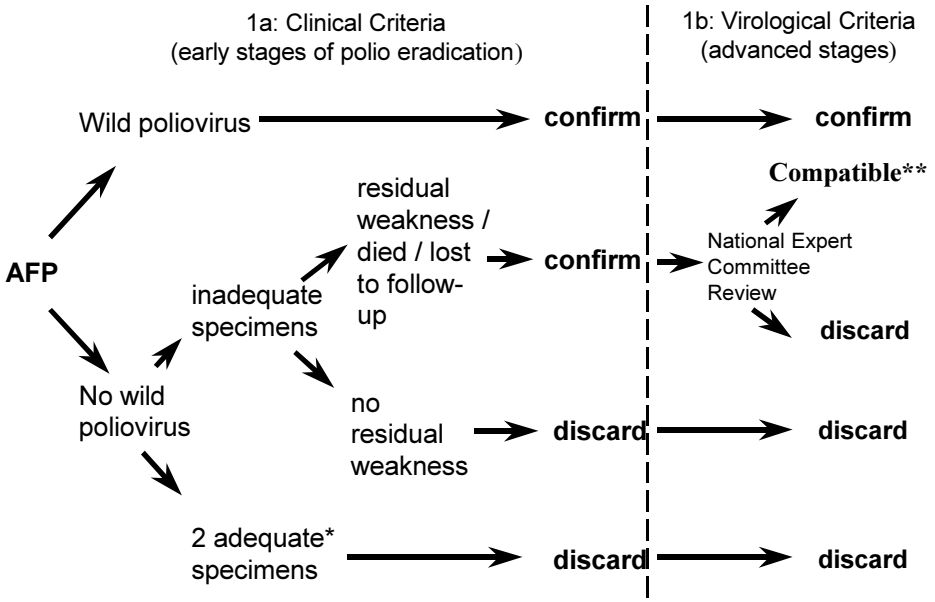
- Track wild poliovirus circulation
- Classify cases as confirmed, poliomyelitis compatible or discarded (see Special Aspects)
- Monitor routine coverage in all geographical areas and focus efforts in low performing geographical areas
- Identify high risk areas for planning mopping up immunization
- Monitor seasonality to determine low season of poliovirus transmission for NIDs planning
- Monitor performance of surveillance using standard indicators and focus efforts in low performing areas
- Provide evidence for polio-free certification

SPECIAL ASPECTS

The scheme in the following illustration (Fig. 1) should be used to classify AFP cases. Countries should use the clinical classification until their surveillance performance meets the following three criteria:

1. A non-polio AFP rate of at least 1/100 000 children under 15 years of age.
2. Two adequate specimens* collected from at least 60% of detected AFP cases.
3. All specimens processed in a WHO-accredited laboratory.

Figure 1: WHO Classification System for Acute Flaccid Paralysis (AFP) Cases



*"Adequate specimens" means 2 specimens collected 24-48 hours apart and within 14 days of onset of paralysis. The specimen arriving at the laboratory must be of adequate volume (approximately 8-10 grams), have appropriate documentation (i.e. laboratory request form) and be in "good condition" (no leakage, no desiccation, and evidence (based on presence of ice or temperature indicator) that the reverse cold chain was maintained.

**"Compatible cases" indicate surveillance failures and should be monitored for clustering in space and time.

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A82 *Rabies*

RATIONALE FOR SURVEILLANCE

Rabies, present on all continents and endemic in most African and Asian countries, is a fatal zoonotic viral disease, transmitted to humans through contact (mainly bites and scratches) with infected animals both domestic and wild. Over 40 000 human deaths are estimated to occur each year worldwide, most of them in the developing world (mainly in Asia), and an estimated 10 million people receive post-exposure treatment after being exposed to animals suspected of rabies.

WHO promotes:

- human rabies prevention through well-targeted post exposure treatment and increased availability of modern rabies vaccine
- disease elimination through mass vaccination of dogs and other animal reservoirs

Surveillance of both human and animal rabies is essential to detect high risk areas and outbreaks quickly and to monitor the use of vaccine.

RECOMMENDED CASE DEFINITION

Clinical description

An acute neurological syndrome (encephalitis) dominated by forms of hyperactivity (furious rabies) or paralytic syndromes (dumb rabies) that progresses towards coma and death, usually by respiratory failure, within 7 to 10 days after the first symptom if no intensive care is instituted. Bites or scratches from a suspected animal can usually be traced back in the patient medical history. The incubation period may vary from days to years but usually falls between 30 and 90 days.

Laboratory criteria for diagnosis

One or more of the following

- Detection of rabies viral antigens by direct fluorescent antibody (FA) in clinical specimens, preferably brain tissue (collected post mortem)
- Detection by FA on skin or corneal smear (collected ante mortem)
- FA positive after inoculation of brain tissue, saliva or CSF in cell culture, in mice or in suckling mice
- Detectable rabies-neutralizing antibody titre in the CSF of an unvaccinated person
- Identification of viral antigens by PCR on fixed tissue collected post mortem or in a clinical specimen (brain tissue or skin, cornea or saliva)
- Isolation of rabies virus from clinical specimens and confirmation of rabies viral antigens by direct fluorescent antibody testing

Case classification

HUMAN RABIES:

Suspected: A case that is compatible with the clinical description.

Probable: A suspected case plus history of contact with suspected rabid animal.

Confirmed: A suspected case that is laboratory-confirmed.

HUMAN EXPOSURE TO RABIES:

Possibly exposed: A person who had close contact (usually a bite or scratch) with a rabies-susceptible animal in (or originating from) a rabies-infected area.

Exposed: A person who had a close contact (usually a bite or scratch) with a laboratory-confirmed rabid animal.

RECOMMENDED TYPES OF SURVEILLANCE

SURVEILLANCE IN HUMAN POPULATIONS:

Surveillance of human exposure to rabies:

At peripheral level, especially in rabies-infected areas, reports of patients with a history of animal contact (usually a bite / scratch) should be investigated at once; when required, they should be treated as an emergency. Case-based and aggregated data must be sent regularly from peripheral to intermediate and central level.

Surveillance of cases of human rabies:

Immediate reporting of suspected and confirmed cases from peripheral level (by diagnosing physician and laboratory) to intermediate and central level.

Rapid exchange of information with services in charge of animal rabies surveillance and control is required.

Epidemiological investigation of outbreaks: Investigation of all rabies foci, identifying sources of infection as will as humans and animals exposed or possibly exposed.

SURVEILLANCE IN ANIMAL POPULATIONS (EPIZOOTIC CONTROL): Where the disease is endemic or could be reintroduced, surveillance of animal rabies and similar conditions in wild and domestic species most likely to be reservoirs of disease must be undertaken. Surveillance is laboratory-based. Immediate submission of brain specimen of suspected animal for laboratory diagnosis when human exposure occurs. Suspected domestic animals at the origin of human exposure that cannot be killed must be kept under observation for 10 days. Rapid exchange of information between services in charge of human and animal rabies surveillance and control is required.

RECOMMENDED MINIMUM DATA ELEMENTS

HUMAN RABIES EXPOSURE

Case-based data: Unique identifier, name, age, geographical information, date(s) of bite / scratch, geographical information (location) of biting episode(s), category of exposure, local wound treatment, vaccination history, previous serum treatment, current treatment, outcome; details of biting animal, vaccination history, outcome.

Aggregated data: Exposures by geographical information on biting episode, biting animal, outcome in animal and human populations.

SURVEILLANCE OF DEATHS FROM HUMAN RABIES

Unique identifier, name, age, geographical information, date of onset of symptoms, date(s) of bite / scratch, geographical information (location) of biting episode(s), site of bite on the body, nature of bite, local wound treatment, vaccination history, previous serum treatment, hospital, treatment details, outcome, details of biting animal, samples taken, sample results.

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Number of human rabies deaths and rabies cases in animals (by species), by date of presentation.

Human exposures by location and dates of biting / scratch episode, by animal species at the origin of exposure and by outcome in human and in animal populations.

Cases by geographical area (e.g., district) and dates of biting / scratch episode, type of animal, occupation and outcome.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Detect outbreaks in endemic areas and new cases in rabies-free area.
- Determine high risk areas for intervention
- Rationalize the use of vaccine and immunoglobulin
- Evaluate effectiveness of intervention at the level of the animal reservoir and exposed human population

SPECIAL ASPECTS

Intersectoral cooperation of medical and veterinary services, community involvement and participation required for targeted response and control in animal reservoir.

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A02.0 *Salmonellosis*

RATIONALE FOR SURVEILLANCE

Salmonellosis is one the main causes of foodborne disease. Detection and control of outbreaks is complicated by the fact that there are over 2200 serotypes of *Salmonella* species, several of which have multiple phage types. Laboratory-based surveillance of salmonellosis with definitive typing and antibiograms allows for rapid identification of clusters. Investigations can then concentrate on individual cases infected with the "epidemic" strain and lead to better identification of risk factors and implicated food items. Utilization of molecular methods can lead to even more accurate identification of "epidemic" strains.

RECOMMENDED CASE DEFINITION

Clinical description

An illness with the following symptoms: diarrhoea, abdominal cramps, fever, vomiting and malaise.

Laboratory criteria for confirmation

Isolation of *Salmonella* spp. from the stool or blood of a patient.

Case classification

Suspected: An individual showing one or more of the clinical features.

Confirmed: A suspected case with laboratory confirmation.

RECOMMENDED TYPES OF SURVEILLANCE

National: The surveillance of salmonellosis is a laboratory-based exercise. The samples examined by laboratories must be generated from cases presenting at health centres, hospitals, or in private practice, and practitioners must be aware of the importance of requesting examination of stool specimens for public health purposes, especially in cases where food- or water borne transmission is suspected.

Surveillance is based on a network of laboratories that routinely report data on isolation of *Salmonella* spp. to central levels. All suspected outbreaks of salmonellosis must be reported to the central level and investigated. In addition, isolates of *Salmonella* spp. may be sent to a reference laboratory for further typing. Definitive typing data can be analysed on a broad geographical basis; this allows for the detection of outbreaks that may not otherwise be detected.

A minimum data set should be collected on each outbreak at intermediate and central levels. This should be done after the outbreak investigation and include key variables on the nature and extent of the outbreak (time, place, person, possible source).

Note: The laboratory network for surveillance of salmonellosis should be as wide and complete as possible. The concentration of facilities for definitive typing in reference laboratories is useful in order to maintain quality. However, care must be taken when relying on the samples processed in such laboratories as they may not always be representative in terms of clinical spectrum or geography.

International: Reports on notifications, laboratory data and outbreaks to be sent to the *WHO Global Database on Foodborne Diseases Incidence* as well as to regional surveillance programmes. Reports on investigations of specific outbreaks, particularly those implicating a commercial product, to the *WHO Global Database on Foodborne Diseases Outbreaks*.

ENTER-NET (previously SALM-NET) is an international network where information on laboratory isolations of salmonella and *Escherichia coli* O157 is shared between countries on much the same basis as within countries. This allows for the detection of outbreaks of international significance and the early warning of countries about contaminated products.

RECOMMENDED MINIMUM DATA ELEMENTS

Case-based data (from laboratory)

- Unique identifier, age, sex, geographical information
- Date of onset, date of specimen
- Specimen type, organism(s) identified

Aggregated data (from laboratory)

- Number of cases by *Salmonella* species, geographical area and age group

Outbreak aggregated data

- Specific salmonella identified by species and phage type
- Number of people at risk / ill / hospitalized
- Number of deaths
- Geographical information, outbreak setting (e.g., restaurant, hospital, school)
- Date of first and last case
- Food or constituent implicated and evidence for implication (e.g., epidemiological investigation, isolation in food)
- Factors contributing to the outbreak (e.g., inadequate storage, inadequate heating, cross-contamination, infected food handler, environmental factors)

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Surveillance data

Frequent review of laboratory data for clusters of cases in time, place or person All suspected clusters must be investigated to establish whether an outbreak has occurred.

Incidence of laboratory identifications by week, geographical area, organism, age group and sex (map incidence by geographical area if possible).

Outbreak investigation data

Incidence of outbreaks by species, phage type, month, geographical area, setting of outbreak, attack-rate, duration of outbreak, foods implicated and factors contributing to the outbreak.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Determine the magnitude of the public health problem
- Detect clusters / outbreaks in good time
- Track trends in salmonellosis over time
- Identify high risk food, high risk food practices and high risk populations for specific pathogens
- Identify emergence of new species and phage types
- Guide the formation of food policy and monitor the impact of control measures
- Assess risks and set standards

SPECIAL ASPECTS

Human surveillance must be linked with food safety and control authorities.

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B65 *Schistosomiasis*

RATIONALE FOR SURVEILLANCE

Schistosomiasis is the second most prevalent tropical disease (following malaria) and a leading cause of severe morbidity in large parts of Africa, Asia and South America. 600 million are at risk; 200 million are infected, of whom 20 million are severely ill.

The main goal for WHO is to control the disease, to reduce and even (in some countries) eliminate the risk of schistosomiasis through strong surveillance and control programmes.

There are 2 types of clinical disease: urinary schistosomiasis (*S. haematobium*) and intestinal schistosomiasis (*S. mansoni, S. japonicum, S. intercalatum, S. mekongi*).

RECOMMENDED CASE DEFINITION

URINARY SCHISTOSOMIASIS

Case definition and classification

ENDEMIC AREAS (MODERATE OR HIGH PREVALENCE)

Suspected: Not applicable.

Probable: Not applicable.

Confirmed: A person with visible haematuria **or** with positive reagent strip for haematuria **or** with eggs of *S. haematobium* in urine (microscope).

NON-ENDEMIC AREAS AND AREAS OF LOW PREVALENCE

Suspected: A person with visible haematuria **or** with positive reagent strip for haematuria.

Probable: Not applicable.

Confirmed: A person with eggs of *S. haematobium* in urine (microscope).

INTESTINAL SCHISTOSOMIASIS

Case definition and classification

ENDEMIC AREAS (MODERATE OR HIGH PREVALENCE)

Suspected: A person with chronic or recurrent intestinal symptoms (blood in stool, bloody diarrhoea, diarrhoea, abdominal pains) or, at a later stage, hepatosplenomegaly.

Probable: A person who meets the criteria for presumptive treatment, according to the locally applicable diagnostic algorithms.

Confirmed: A person with eggs of *S. mansoni,* or *S. japonicum/mekongi* in stools (microscope).

NON-ENDEMIC AREAS AND AREAS OF LOW PREVALENCE

Suspected: A person with chronic or recurrent intestinal symptoms (blood in stool, bloody diarrhoea, diarrhoea, abdominal pains) or, at a later stage, hepatosplenomegaly.

Probable: Not applicable.

Confirmed: A person with eggs of *S. mansoni* or *S. japonicum* in stools (microscope).
A person with positive reaction to immunoblot test.

RECOMMENDED TYPES OF SURVEILLANCE

Surveillance of schistosomiasis must be incorporated in the primary health care system.

For low-prevalence zones, and where eradication is targeted:

Routine monthly reporting of aggregated suspected or confirmed cases from peripheral level to intermediate and central level.

***International*:** Yearly reporting from central level to WHO.

For endemic zones:

If no integration of surveillance is possible in the primary health care system: ad hoc surveys to evaluate the prevalence of infection in the community. Children of

school age have been identified as a good indicator of prevalence in the general population and therefore an appropriate group for investigation.

Yearly reporting of aggregated data from peripheral level to intermediate and central levels.

Note: Data from general health statistics often underestimate prevalence but may nevertheless indicate a relatively high prevalence in a particular area.

Surveillance has to take into account the distribution of the disease in geographical foci. Adjacent areas may have very different prevalence rates.

RECOMMENDED MINIMUM DATA ELEMENTS

FOR LOW-PREVALENCE ZONES, AND WHERE ERADICATION IS TARGETED

Individual patient record for investigation

Identification number, age, place of infection, date of diagnosis, village.

Number of eggs per gram of stools/ml of urine.

Aggregated data

Number of cases by age group and village and month.

Number of cases with ≥50 eggs/10 ml of urine and / or visual haematuria (*S. haematobium*).

Number of cases with ≥400 eggs/g of stools *(S. mansoni* or *S. japonicum*).

FOR ENDEMIC ZONES

Aggregated data

Number of cases by age group and village.

Number of cases with ≥50 eggs/10 ml of urine and / or visual haematuria (*S. haematobium*).

Number of cases with ≥400 eggs/g of stools (*S. mansoni* or *S. japonicum*).

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

- Incidence (if passive reporting or passive surveillance) monthly and yearly by age group and village
- Point prevalence (if active finding)
- Mapping

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Assess the magnitude of the problem
- Plan drug distribution: establish treatment strategies in health services (diagnostic algorithims), select most cost-effective strategy for community-based chemotherapy (universal-targeted-selective)
- Evaluate the need for snail control
- Evaluate the need for improved water supply and sanitation
- Evaluate the need for health education activities
- Evaluate the impact of intervention

SPECIAL ASPECTS

- Diagnosis: quantitative diagnostic methods (Kato-Katz technique for intestinal forms, urine filtration for *S. haematobium*) are very important in surveillance; they indicate the public health relevance of the infection
- Collection of data immediately relevant to management decision (e.g., treatment frequency and resource allocation) should be encouraged
- Intersectoral efforts, emphasizing school education, safe water supply and sanitation, environmental management and community participation are important
- Rectal biopsy is usually not used for surveillance purpose

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A50-52 *Syphilis*

RATIONALE FOR SURVEILLANCE

Having decreased after the introduction of penicillin treatment in 1946, syphilis re-emerged in the end of the sixties and has remained at high incidence levels in developing countries. Developed countries are now also experiencing outbreaks and countries in economic transition are experiencing a marked and widespread recrudescence.

Syphilis prevalence data in pregnant women provide information about both latent and symptomatic syphilis in this group, and minimize the problems associated with general reporting of sexually transmitted syndromes. Subject to variations in health care seeking behaviour, this can be considered an approximation of syphilis prevalence in the general population.

RECOMMENDED CASE DEFINITION

Clinical description

The signs and symptoms of syphilis are multiple. The primary stage usually, but not necessarily, involves ulceration of the external genital organs and local lymphadenopathy; secondary and tertiary syphilis show mainly dermatological and systemic manifestations. For surveillance purposes, only confirmed cases (see below) will be considered.

Confirmed case

A person with a confirmed positive serology for syphilis (Rapid Plasma Reagin (RPR) or VDRL confirmed by TPHA (*Treponema pallidum* haemagglutination antibodies) or FTA (fluorescent treponemal antibody-absorption).

Case classification

Congenital syphilis: An infant with a positive serology, whether or not the mother had a positive serology during the pregnancy.

Acquired syphilis: All others.

RECOMMENDED TYPES OF SURVEILLANCE

Only confirmed cases should be reported to intermediate and central level by:

- Routine case-based or aggregate reporting
- Periodic surveillance reports

Laboratory-based surveillance through screening of pregnant women

Routine reporting from antenatal (AN) clinics and sentinel sites of AN clinics

Active case finding from prevalence surveys in pregnancy

RECOMMENDED MINIMUM DATA ELEMENTS

Aggregated data

Number of cases of positive serology for syphilis by age group, month, geographical area.

Number of cases of congenital syphilis by age group, gravidity, years, geographical area.

Performance indicators

False-positive rate at sentinel sites according to type of test (TPHA / FT-AB).

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Cases / incidence by geographical area, age, parity.

Comparisons with age group and geographical area in previous years (line graph).

Rate of congenital syphilis by geographical area by year (line graph).

Annual surveillance summaries to be produced nationally and regionally and fed back.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Document syphilis prevalence by screening pregnant women as a surrogate for general population
- Monitor trends in disease incidence
- Advocate syphilis control, and interventions
- Identify high risk areas for further targeting intervention
- Identify areas and populations where HIV prevention activities should be enhanced

SPECIAL ASPECTS

- The prevalence rate among pregnant women in developing countries varies between 3% and 19%. Maternal syphilis is associated with congenital syphilis (one third of births from such pregnancies), and with spontaneous abortion and stillbirth. Because the primary lesion is often painless and secondary syphilis is usually not diagnosed, women are mainly identified through serological screening. Syphilis surveillance is thus best performed in pregnant women
- In order to screen all pregnant women as per national policy guidelines, women should attend early for antenatal care. Clinic staff should take blood and send it to laboratory; laboratory staff should report results to clinic; women should attend for next visit and receive results and clinic staff should provide treatment and health education
- Syphilis in cases of genital ulcer should be reported separately in countries with access to laboratory facilities, in order to avoid double-counting

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A33 *Tetanus, neonatal*

RATIONALE FOR SURVEILLANCE

Targeted for **elimination** (9GPW). The 3 primary strategies towards this goal are:

1. High tetanus toxoid (TT) coverage of pregnant women.
2. Clean delivery.
3. Identification of high risk areas and implementation of corrective action (immunization of childbearing-age women) in these areas.

Epidemiological surveillance is particularly useful in order to identify high risk areas and monitor the impact of interventions.

RECOMMENDED CASE DEFINITION

Clinical case definition and case classification

Suspected case: Any neonatal death between 3-28 days of age in which the cause of death is unknown; or any neonate reported as having suffered from neonatal tetanus between 3-28 days of age and not investigated.

Confirmed case: Any neonate with a normal ability to suck and cry during the first two days of life, and who between 3 and 28 days of age cannot suck normally, and becomes stiff or has convulsions (i.e. jerking of the muscles) or both.

Hospital-reported cases of neonatal tetanus are considered confirmed.

The diagnosis is purely clinical and does not depend upon laboratory or bacteriological confirmation.

RECOMMENDED TYPES OF SURVEILLANCE

The number of confirmed neonatal tetanus cases must be included in routine monthly surveillance reports of all countries and reported as a separate item from other (non-neonatal) tetanus. Zero reporting is required at all levels.

Active surveillance in major health facilities on a regular basis (at least once a year).

In “low risk” geographical areas (incidence<1/1000 live births with effective surveillance), all suspect cases should be investigated to confirm the case and identify the cause.

Community surveillance in “silent” areas (i.e. where routine reporting is not functional but where, based on other indicators, neonatal tetanus could be a problem).

RECOMMENDED MINIMUM DATA ELEMENTS

Aggregated data for reporting

- Number of cases
- Doses of TT administered to pregnant women or women of child-bearing age (depending on national policy) or percentage of newborns protected at birth (PAB); see Special Aspects
- Completeness / timeliness of monthly reports

Case-based data, individual patient records for investigation

- Unique identifier
- Geographical information
- Date of birth
- Age (in days) of infant at onset
- Sex of infant
- Parity of mother (total number of deliveries including current delivery or pregnancy)
- Date of case investigation
- Type of birth: 1=institution; 2=home with trained attendant

- 3=home with untrained attendant; 4=home without attendant; 5=other; 9=unknown
- Tetanus immunization status of mother when she gave birth: 1=up-to-date; 2=not up-to-date; 3=unimmunized; 9=unknown
- Final classification: 1=confirmed; 2=suspected; 3=discarded
- Mother given protective TT dose within 3 months of report: 1=yes; 2=no; 9=unknown
- Supplemental immunization conducted within same locality as case: 1=yes; 2=no; 9=unknown

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

For aggregated data (i.e. routine monthly reporting)

- Incidence rate per 1000 live births by geographic area, month, and year
- TT2+ (or %PAB*) by year and geographic area
- Completeness / timeliness of monthly reporting
- Geographical areas considered at high risk for neonatal tetanus compared to those where corrective actions were taken

*See Special Aspects

For case based data (case investigations only) same as for aggregated data plus

- Confirmed neonatal tetanus cases by delivery type, sex, TT2+ status of mother
- % of confirmed cases for which the mother later received a protective TT dose

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Monitor progress towards achieving and sustaining high routine TT2+ (or PAB) coverage in all geographical areas
- Monitor progress towards eliminating neonatal tetanus in every geographical area
- Investigate suspect neonatal tetanus cases in areas not considered at risk for neonatal tetanus to confirm and determine cause
- Identify high risk geographical areas and conduct 3 rounds of supplemental TT immunization in those areas
- Periodically validate sensitivity of neonatal tetanus reporting and surveillance by comparing the number of reported cases with the number of cases identified through active surveillance

SPECIAL ASPECTS

"%PAB (Protected at Birth)" is an alternative method of determining coverage (particularly where TT2+ is unreliable). To monitor this, health workers record during DTP1 visits whether the infant was protected at birth by the mother's TT status and/or delivery status (clean / unclean). % PAB is then estimated from the ratio of infants protected / number of live births. If the child was unprotected, the mother should receive a dose of tetanus toxoid during the same visit and should be followed up with a subsequent TT dose for protection.

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B56-0, B56-1 *African trypanosomiasis*
(Sleeping sickness)

RATIONALE FOR SURVEILLANCE

The leading principle for sleeping sickness control is the reduction of human reservoir through treatment of infected individuals and the reduction of man-fly contact through adapted vector control. An intercountry approach for surveillance / control activities is essential and supported by WHO. The objective of surveillance is the precise identification and proper epidemiological assessment of all endemic foci.

RECOMMENDED CASE DEFINITION

Clinical description

In the early stages, a painful chancre*, which originates as a papule and evolves into a nodule may be found at the primary site of tsetse fly bite. There may be fever, intense headache, insomnia, painless lymphadenopathy, anaemia, local oedema and rash. In the later stage, there is cachexia, somnolence and signs of central nervous system involvement. The disease may run a protracted course of several years in the case of *Trypanosoma brucei gambiense*. In case of *T. b. rhodesiense*, the disease has a rapid and acute evolution. Both diseases are always fatal without treatment.

*The painful chancre is very rare in *T. b. gambiense* infection.

Laboratory criteria for diagnosis

Presumptive: serological: card agglutination trypanosomiasis test (CATT) for *T. b. gambiense* only or immunofluorescent assay (IFA) for *T. b. rhodesiense* mainly and possibly for *T. b. gambiense.*

Confirmative: parasitological: detection(microscopy) of trypanosomes in blood, lymph nodes aspirates or CSF.

Case classification

Suspected: A case that is compatible with the clinical description and/or a history of exposure.**

Probable: A case with a positive serology with or without clinical symptoms in persons without previous history of trypanosomiasis diagnosis or treatment.

Confirmed: A case with positive parasitology, with or without clinical symptoms.***

** In the early stage or even early in the late stage of the disease there are often no clinical signs or symptoms which can be associated with the disease. Suspicion is then based on local risk of contracting the disease and local disease historical background.

*** Confirmed positive healthy carriers are a major public health risk. As a reservoir of parasites, they disseminate the disease, and must be treated as soon as possible.

RECOMMENDED TYPES OF SURVEILLANCE

- The surveillance system will use a village-based definition using 4 classes:
  - Village of unknown epidemiological status
  - Suspected village
  - Endemic village
  - Disease-free village
- In the context of control programmes, surveillance provides valuable village-based data, with the precise geographic location of each village using global positioning system (GPS). Data are analysed using geographical information systems (GIS)
- In areas not covered by control activities, surveillance provides valuable case-based information. Results of serological surveys based on micro-card agglutination trypanosomiasis tests (micro-CATT) will be indicators of endemicity
- Information collected at village level is aggregated at intermediate / central level and reported to WHO

RECOMMENDED MINIMUM DATA ELEMENTS

Village-based data

In addition to the number of parasitologically confirmed cases (presence of trypanosomes shown), and to the number of probable cases (suspected cases with positive serology), the system should include information on:

- strategy used
- village geographic coordinates (latitude, longitude)
- name
- administrative levels
- village type
- population at last census / date of last census, estimated population
- school (levels)
- health infrastructures (type, activities)
- protected sources of water

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Mapping*:* at intermediate and central level: map of villages and their endemic status.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Knowledge of endemic and suspected areas to direct control activities
- Epidemiological monitoring of endemic foci
- Assessing impact of control programmes

SPECIAL ASPECTS

- Use of Global Positioning System (GPS) to define village geographic coordinates
- Sensitivity of parasitological techniques is low and depends on laboratory facilities and personnel skills

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B57 *American trypanosomiasis*
(Chagas' disease)

RATIONALE FOR SURVEILLANCE

Targeted by WHO for **elimination** by the year 2000 (Resolution WHA51.14), American trypanosomiasis affects 17 countries with 16-18 million infected and over 100 million individuals at risk of infection. The disease is prevalent in the northern part of South America (the Andean Region) and in Central America; almost 25 million people are at risk and there are 5 to 6 million infected. The disease is potentially fatal and non-treatable; one third of those infected become incapacitated due to cardiac damage. Infection can also be acquired through blood transfusion.

The infection can be effectively eliminated through interruption of vector transmission and systematic screening of blood donors. Elimination has been successful in some countries of the Southern Cone of South America (Argentina, Bolivia, Brazil, Chile, Paraguay and Uruguay); surveillance is necessary to monitor prevention and control measures.

RECOMMENDED CASE DEFINITION

ACUTE STAGE

Clinical description

The main clinical signs are mainly fever, malaise, hepatosplenomegaly and lymphadenopathy in the acute phase. Many patients present without clinical signs. An inflammatory response at the site of infection (chagoma) may last up to 8 weeks.

Laboratory criteria for diagnosis

- Positive parasitology (direct, xenodiagnosis, blood culture) **and/or**
- Positive serology for *Trypanosoma cruzi* antibodies (IgM) (indirect haemagglutination test (IHA), indirect immunoflourescent antibody test (IFAT), direct agglutination test (DA) and ELISA)

Case classification

Suspected:	Not applicable.
Probable:	(*Endemic areas*) a case with unexplained fever, hepatosplenomegaly and a *chagoma* (inflammation at site of infection).
Confirmed:	A clinically compatible case that is laboratory-confirmed.
Congenital:	A newborn with positive parasitology (direct, xenodiagnosis, culture).
Indeterminate:	Positive serology for *T. cruzi* antibodies alone, no other clinical findings related to the disease (e.g in blood donors).
Chronic:	Positive serology or parasitology with chronic cardiac lesions and/or enlargement of the digestive viscera and/or peripheral neuropathies.

RECOMMENDED TYPES OF SURVEILLANCE

In endemic areas, sentinel surveillance may be the only feasible method at present.

Where possible, routine surveillance should be integrated in primary health services. At peripheral level, individual patient records must be maintained. Routine monthly reporting of aggregated data from peripheral level to intermediate level. Routine biannual reporting of aggregated data to central level.

All blood donations must be screened locally.

Serological surveys (standardized and periodical) for surveillance and control.

RECOMMENDED MINIMUM DATA ELEMENTS

CLINICAL SURVEILLANCE

Individual patient records

Unique identifier, name, age, sex, geographical information, laboratory results.

Aggregated data for reporting

- Number of cases identified from transfusion donors
- Number of cases by age / sex / means of diagnosis
- Number of cases with positive serology

(Number of houses or communities subject to annual vector control)

LABORATORY SURVEILLANCE

Isolate-based data for reporting*

Scientific name of organism, clinical form, organ or tissue, geographical information (patient location), date of isolation, name laboratory, laboratory number of isolate, identification methods used, results.

*(*WHO Technical Report Series N° 811: Control of Chagas disease.* Geneva: World Health Organization, 1991: 77-78)

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Graphs:	Number of cases by geographical area, month, and means of diagnosis.
Maps:	Number of cases by geographical area Vector control activities / geographical area / prevalence of disease.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Monitor disease prevalence and measure the impact of disease
- Monitor control and elimination programme
- Target resources for prevention

SPECIAL ASPECTS

- Control has until now depended on vertical programmes. Monitoring and surveillance have been conducted during specific surveys. To integrate the control programme into PHC requires a network of laboratory services with different facilities at different levels for diagnosis
- Because of variation in specificity of the tests, cut-off points should be defined locally using a standard serum panel, provided by the reference laboratories of the intercontinental network for standardized serology in Brazil and Argentina
- A national laboratory network should be established in each of the countries in which Chagas' disease is endemic

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A15-A19 *Tuberculosis*

RATIONALE FOR SURVEILLANCE

About one-third of the world's population is infected by *Mycobacterium tuberculosis*. Between 7 and 8.8 million new cases occur each year, 95% in developing countries; some 3.3 million cases of tuberculosis are notified each year. Projections into the next century suggest that the impact of tuberculosis will increase if no adequate control is established immediately in all countries.

The overall objective of tuberculosis control is to reduce morbidity, mortality and transmission of the disease until it no longer poses a threat to public health. To achieve this objective, the 1991 World Health Assembly endorsed the following targets for global tuberculosis control:

- successful treatment for 85% of the detected new smear-positive cases
- detection for 70% of smear-positive cases by the year 2000

Surveillance of tuberculosis helps to monitor the course of the tuberculosis epidemic, and patient cohort analysis is used to evaluate treatment outcomes.

RECOMMENDED CASE DEFINITIONS

DEFINITIONS OF WHO/IUATLD
(INTERNATIONAL UNION AGAINST TUBERCULOSIS AND LUNG DISEASES)

1. Site and bacteriology

Pulmonary tuberculosis, sputum smear positive (PTB+)

- Tuberculosis in a patient with at least two initial sputum smear examinations (direct smear microscopy) positive for Acid-Fast Bacilli (AFB), **or**
- Tuberculosis in a patient with one sputum examination positive for acid-fast bacilli and radiographic abnormalities consistent with active pulmonary tuberculosis as determined by the treating medical officer, **or**
- Tuberculosis in a patient with one sputum specimen positive for acid-fast bacilli and at least one sputum that is culture positive for acid-fast bacilli.

Pulmonary tuberculosis, sputum smear negative (PTB-)

Tuberculosis in a patient with symptoms suggestive of tuberculosis and having one of the following:

- Three sputum specimens negative for acid-fast bacilli
- Radiographic abnormalities consistent with pulmonary tuberculosis and a lack of clinical response to one week of a broad-spectrum antibiotic
- Decision by a physician to treat with a full curative course of anti-tuberculous chemotherapy

Pulmonary tuberculosis, sputum smear negative, culture positive

Tuberculosis in a patient with symptoms suggestive of tuberculosis and having sputum smear negative for acid-fast bacilli and at least one sputum that is culture positive for *M. tuberculosis* complex

Extra-pulmonary tuberculosis

- Tuberculosis of organs other than lungs: pleura, lymph nodes, abdomen, genito-urinary tract, skin, joints and bones, tuberculous meningitis, etc.
- Diagnosis should be based on one culture positive specimen from an extra-pulmonary site, or histological or strong clinical evidence consistent with active extra-pulmonary tuberculosis, followed by a decision by a medical officer to treat with a full course of anti-tuberculous therapy
- Any patient diagnosed with both pulmonary and extra-pulmonary tuberculosis should be classified as a case of pulmonary tuberculosis

2. Category of Patient

New case: A patient who has never had treatment for tuberculosis or took anti-tuberculous drugs for less than 4 weeks.

Relapse case: A patient previously treated for tuberculosis and declared cured by a medical officer after one full course of chemotherapy, but who reports back to the health service bacteriologically positive (smear or culture).

In addition to these definitions, European countries also report cases as "definite" (confirmed by culture of *M. tuberculosis* complex or by sputum smear examinations positive for acid-fast bacilli) or "other than definite" (based on a clinician's impression of symptoms, signs and radiological findings and decision to treat the patient with a full course of anti-tuberculosis treatment).

RECOMMENDED TYPES OF SURVEILLANCE

Registration of diagnosed cases at district level.

Quarterly reports on case notifications and cohort analysis of treatment outcomes (at peripheral, intermediate, and central level).

RECOMMENDED MINIMUM DATA ELEMENTS

Case notifications by category

- Number of new pulmonary sputum smear positive cases
- Number of pulmonary relapse cases
- Number of new pulmonary sputum smear negative cases
- Number of new extra-pulmonary cases
- Number of new pulmonary sputum smear positive cases by age and gender (suggested age groups: 0-14, 15-24, 25-34, 35-44, 45-54, 55-64, 65+ years)

Treatment results for new sputum smear positive cases:

(usually as a percentage of all new sputum smear positive cases registered during the same period of time):

- Number of cases who converted to negative after initial phase of treatment
- Number of cases cured (i.e., completed treatment and at least 2 negative sputum smear results during the continuation phase of treatment, one of which occurred at the end of treatment)
- Number of cases who, after smear conversion at the end of initial phase of treatment, completed treatment, but without smear results at the end of treatment
- Number of cases who died (regardless of cause)
- Number of cases who failed treatment (i.e., became positive again or remained smear positive, 5 months or more after starting treatment)
- Number of cases who interrupted treatment / defaulted (i.e., did not collect drugs for 2 months or more after registration)
- Number of cases who were transferred out (i.e., transferred to another reporting unit and results not known)

Note: In countries routinely using culture as a diagnostic tool, the treatment results may be based on a second culture obtained during the continuation phase of treatment.

RECOMMENDED DATA ANALYSIS, PRESENTATION, REPORTS

Analysis of geographical area (district) quarterly reports

- ***Treatment success rate:*** number of cases cured, plus patients who completed treatment, as a ratio of all cases registered during the same period of time
- ***Quality of diagnostic services****:* ratio of new sputum-smear positives to all pulmonary cases

Presentation and reports

Graphs:

- Case notification rates over several years by geographical area, regions, country
- Case notification rates (new sputum smear positives) by age and sex
- Case detection rate*:* ratio of the tuberculosis cases detected by the national tuberculosis control programme to the number of cases estimated to have occurred in the country

Tables:

Describe quarterly reports by case finding and treatment outcomes.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- At local level: ensure that appropriate treatment services are offered, contact tracing is carried out, local outbreaks are recognized, and local epidemiology is monitored
- At national level: facilitate monitoring of the epidemiology of the disease and of the performance of treatment programmes (ability of a National Tuberculosis Programme to detect tuberculosis cases, diagnose sputum positive cases, treat tuberculosis cases successfully); and facilitate planning for programme activities (e.g., securing drug supply, lab supply, etc.)
- At international level: examine trends over time and make inter-country comparisons with the aim of coordinating control efforts

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A75.3 *Scrub typhus*

(Mite-borne typhus, Tsutsugamushi disease)

RATIONALE FOR SURVEILLANCE

Scrub typhus (mite-borne typhus, Tsutsugamushi disease) is an acute infectious disease that is emerging and re-emerging in South-East Asia and the south-western Pacific region. It can have a case-fatality rate of up to 30% if untreated. Epidemics occur when susceptible individuals are brought into endemic areas (e.g., during military operations). In some countries (e.g., Japan) it is a notifiable disease. Multi-drug resistance has been documented in Thailand.

Surveillance is essential to a better understanding of the epidemiology of the disease and to the detection of outbreaks. Training in diagnostic techniques is often required.

RECOMMENDED CASE DEFINITION

Clinical description

A disease with a primary "punched out" skin ulcer (eschar*) where the bite(s) occurred, followed by acute onset fever after several days, along with headache, profuse sweating, conjunctival injection and lymphadenopathy. Within a week, a dull maculo-papular rash** appears on the trunk, extends to the extremities and disappears in few days. Cough is also common. Defervescence within 48 hours following tetracycline therapy strongly suggests a rickettsial etiology.

* Eschar may be absent in some geographic areas and in highly endemic areas where reinfection is frequent.

** Rash may be overlooked in patients with dark or sunburned skin.

Laboratory criteria for diagnosis

Isolation of *Orientia* tsutsugamushi* by inoculation of patient blood in white mice (preferably treated with cyclophosphamide at 0.2 mg/g intraperitoneally or intramuscularly on days 1,2 and 4 after inoculation).

* Formerly *Rickettsia.*

Serology: Detection of specific IgM
at 1:100 or higher by Enzyme Immunoassay (EIA)
or 1:32 dilution or higher by Immunoperoxidase (IP)
or 1:10 dilution or higher by Indirect Immunofluorescence (IF).

Case classification

Suspected: A case that is compatible with the clinical description.

Confirmed: A suspected case with laboratory confirmation.

Note: Serological tests are complicated by the antigenic differences between various strains of the causal agent.

RECOMMENDED TYPES OF SURVEILLANCE

Immediate case-based reporting of all suspected cases from the peripheral level to the intermediate and central level. All suspected cases and outbreaks must be confirmed. A parallel laboratory surveillance system reports all confirmed cases to central level.

RECOMMENDED MINIMUM DATA ELEMENTS

Case-based data to report

- Case classification (suspected / confirmed)
- Unique identifier, age, sex, geographical information
- Date of report
- Hospitalization (Y/N)
- Response to tetracycline therapy
- Outcome

Aggregated data to report

- Number of cases by case classification, age, sex, geographical information, date of report
- Number of hospitalizations
- Number of deaths

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Graphs: Number of cases by date of report.
Tables: Number of cases by age, geographical area.
Maps: Number of cases, and if appropriate, deaths, by geographical area.

PRINCIPAL USES OF DATA FOR DECISION-MAKING

- Detect outbreaks
- Monitor trends in endemic disease
- Monitor changes in epidemiology and pattern of disease

SPECIAL ASPECTS

The distribution of *O. tsutsugamushi* extends north to Japan, Russia, and the Primorske Karai region in the Russian Far East, south to northern Australia and the western Pacific islands, and west to Afghanistan, Pakistan, and areas bordering the Central Asian Republics.

Human *O. tsutsugamushi* occurs widely in these regions, but not everywhere.

Scrub typhus is probably one of the most underdiagnosed and underreported febrile illnesses requiring hospitalization in the region. The absence of definitive signs and symptoms combined with a general dependence upon serological tests make the differentiation of scrub typhus from other common febrile diseases such as murine typhus, typhoid fever and leptospirosis quite difficult.

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A95.9 *Yellow fever*

Case report universally required by *International Health Regulations*

RATIONALE FOR SURVEILLANCE

This mosquito-borne virus disease occurs in tropical regions of Africa and South America and is maintained by sylvatic transmission of virus involving forest-dwelling mosquitoes and monkeys. Transmission to humans may occur in forest transition zones and may subsequently enter an urban cycle through *Aedes aegypti*. Many cities are now threatened with epidemics as yellow fever is undergoing a major resurgence especially in the African region. Surveillance data allow for monitoring disease incidence, prediction and early detection of outbreaks and monitoring of control measures.

Strategies for yellow fever control include control of *Ae. aegypti* in urban centres, infant immunization, vaccination campaigns, outbreak prevention, epidemic detection and control.

Case reporting is universally required by *International Health Regulations.*

RECOMMENDED CASE DEFINITION

Clinical description

Characterized by acute onset of fever followed by jaundice within 2 weeks of onset of first symptoms. Haemorrhagic manifestations and signs of renal failure may occur.

Laboratory criteria for diagnosis

Isolation of yellow fever virus, **or**

Presence of yellow fever specific IgM or a four-fold or greater rise in serum IgG levels in paired sera (acute and convalescent) **or**

Positive post-mortem liver histopathology **or**

Detection of yellow fever antigen in tissues by immunohistochemistry **or**

Detection of yellow fever virus genomic sequences in blood or organs by PCR

Case classification

Suspected: A case that is compatible with the clinical description.

Probable: Not applicable.

Confirmed: A suspected case that is laboratory-confirmed (national reference lab) or epidemiologically linked to a confirmed case or outbreak.

RECOMMENDED TYPES OF SURVEILLANCE:

Routine weekly / monthly reporting of aggregated data on suspected and confirmed cases from peripheral to intermediate and central level. Zero reporting required at all levels.

Immediate reporting of suspected cases from peripheral to intermediate and central levels.

All suspected cases and outbreaks must be investigated immediately and laboratory-confirmed.

Case-based surveillance must be implemented in countries identified by WHO as being at high risk for yellow fever. Specimens must be collected to confirm an epidemic as rapidly as possible. Priority is placed on collecting specimens from new or neighbouring areas (other than the area where the epidemic is already confirmed).

International: Mandatory reporting of all suspected and confirmed cases within 24 hours to WHO.

RECOMMENDED MINIMUM DATA ELEMENTS

Aggregated data for reporting

Number of cases

Doses of yellow fever vaccine administered to infants, by geographical area

Completeness / timeliness of monthly reports

Case-based data for reporting and investigation

Unique identifier

Geographical area name (district and province)

Date of birth

Date of onset

Date of notification

Date of investigation

Ever received a dose of yellow fever vaccine? (1=yes; 2=no; 9=unknown)

Date acute blood specimen received in laboratory

Date convalescent blood specimen received in laboratory (if applicable)

Date histopathology specimen collected (if applicable)

Depending on which laboratory tests used:

- IgM (1=positive; 2=negative; 3=no specimen processed; 9=unknown)
- virus isolation (1=positive; 2=negative; 3=no specimen processed; 9=unknown)
- IgG (4-fold rise) (1=positive; 2=negative; 3=no specimen processed; 9=unknown)
- liver

Date IgM results first sent

Date virus isolation results first sent

Final classification

Date histopathology report first sent

Date convalescent blood specimen received in laboratory (if applicable)

Date histopathology specimen collected

Date IgG results first sent

Final classification (1=confirmed; 2=suspected; 4=discarded)

Final outcome (1=alive; 2=dead; 9=unknown)

RECOMMENDED DATA ANALYSES, PRESENTATION, REPORTS

Aggregated data

- Incidence rate by month, year, and geographic area
- Yellow fever vaccine coverage by year and geographic area
- Completeness / timeliness of monthly reporting

Case-based data same as aggregated data plus the following:

- Confirmed cases by age group, immunization status, geographic area, month, year
- Case-fatality rate
- Final classification of all suspected cases

PERFORMANCE INDICATORS OF SURVEILLANCE QUALITY TARGET

	target
Completeness of monthly reporting	≥90%
Percent of all suspect cases for which specimens were collected	≥50%*
If IgM test is done: Laboratory results sent ≤3 days of receipt of acute blood specimen	≥80%
If virus isolation is done: results sent ≤ 21days of receipt of acute blood specimen	≥80%
If IgG test is done: results sent ≤3 days of receipt of convalescent blood specimen	≥80%

*Target during non-outbreak periods. Once an outbreak is confirmed, the priority is to detect outbreaks in neighbouring areas and confirm them in the laboratory.