

# World Health Organization

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## JRF Supplementary Questionnaire on Surveillance

Global Immunization Monitoring and Surveillance (GIMS)  
Expanded Programme on Immunization (EPI)  
Department of Immunization, Vaccines and Biologicals (IVB)

2017



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## **Acronyms**

AFRO:	WHO Regional Office for the African Region
AMRO:	see PAHO
CRS:	Congenital rubella syndrome
EPI:	Expanded Programme on Immunization
EMRO:	WHO Regional Office for the Eastern Mediterranean
EURO:	WHO Regional Office for the European Region.
GIMS:	Global Immunization Monitoring and Surveillance
Hi:	<i>Haemophilus influenzae</i>
HQ:	WHO Headquarters in Geneva, Switzerland
IVB:	Department of Immunization, Vaccines and Biologicals
JE:	Japanese encephalitis
JRF:	[WHO/UNICEF] Joint Reporting Form on immunization data
PAHO:	Pan American Health Organization
SEARO:	WHO Regional Office for South-East Asia
UNICEF:	United Nations International Children's Emergency Fund
VPD:	Vaccine-preventable disease
WHO:	World Health Organization
WPRO:	WHO Regional Office for the Western Pacific
YF:	Yellow fever

## **Contact**

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## **Disclaimer**

The boundaries and names shown and the designations used in the included maps do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

## **Methods**

In 2017, WHO and UNICEF disseminated an electronic questionnaire to all 194 WHO member (hereinafter referred to as countries). The questionnaire requested information on the current status of surveillance for 28 current and potential future VPDs, attributes of surveillance conducted for each VPD, and details about current measles and rubella surveillance system(s) in each country. Data provided by member states was reviewed, and countries were asked, through WHO regional offices, to clarify and/or correct discrepancies that were found. Data on measles and rubella surveillance systems were supplemented by reviewing other sources of information that are provided to WHO or the public through the internet. These additional data sources included annual measles verification reports provided to WHO as part of the regional measles verification process for countries in EURO and SEARO, national surveillance guidelines, and the WHO/UNICEF Joint Reporting Form on immunization (JRF). Data on meningococcus surveillance systems was supplemented by the MenAfriNet regional surveillance network for those countries that are in the meningitis belt. Data was stored and analysed using Microsoft Excel and the results were mapped using ArcGIS software.

### **Mapping**

Map production and data source: GIMS, EPI, IVB, WHO. 2017. All rights reserved.

### **Recommended Minimum-Standard Surveillance**

Minimum surveillance standards recommended by WHO HQ have been defined as part of the update of VPD surveillance standards, with the plan for global dissemination in mid-2018. However, in preparation for those, we compared what countries were doing to the recommended minimum-standards to understand where surveillance is and how much further platforms need to be modified and/or enhanced. If countries failed to completely provide information on the attributes of the surveillance being conducted, then it could not be determined if the country was meeting the minimum-standard recommended.

### **Joint Reporting Form Cases**

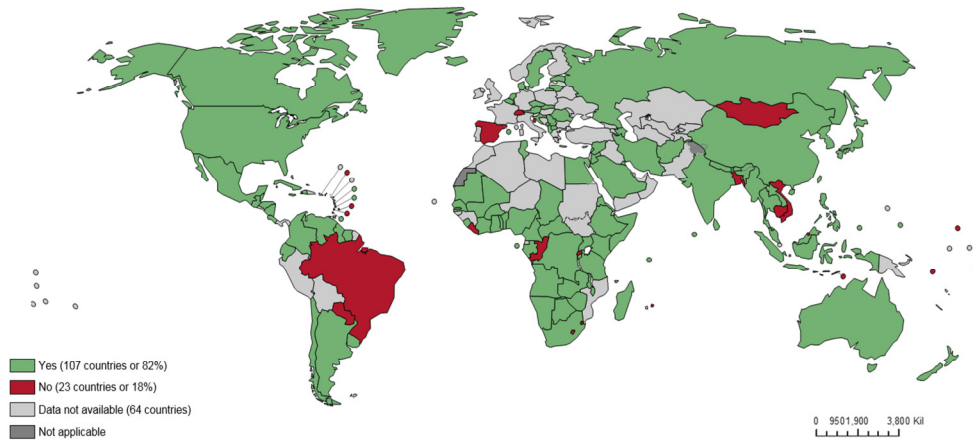
The JRF is distributed annually to WHO and UNICEF member states by WHO and UNICEF. The monitoring and evaluation tool gathers information on vaccination programs, immunization coverage, reported cases of certain VPDs and disease surveillance. Cases reported in 2016 through the JRF indicate some type of surveillance system is in place in the country, though specific details are unknown since only case counts are requested. For reports of zero cases, it is not always clear whether there is a surveillance system in place and no case was detected, or whether that disease is not notifiable. Data on cases by country can be found [here](#).

## ***Limitations***

The surveillance questionnaire was a one-time supplement to the 2017 WHO/UNICEF JRF. Questions asked were new to countries which may have affected the accuracy and completeness of data reported. The data included in this report should be interpreted with the understanding that some data quality issues may exist depending on how the country completed the questionnaire and/or interpreted the questions. However, countries that submitted data with missing information or data inconsistencies were provided the opportunity to clarify and/or correct discrepancies. Additionally, for measles and rubella surveillance systems, as mentioned, external data sources were reviewed and supplemented for countries that did not respond to the surveillance questionnaire. Finally, data collected from the surveillance questionnaire includes self-reported data at the country level. National recommendations and policies reported may not accurately reflect actual surveillance currently being conducted throughout the country, and might miss surveillance being conducted by non-national authorities such as academic institutions and/or non-governmental organizations.

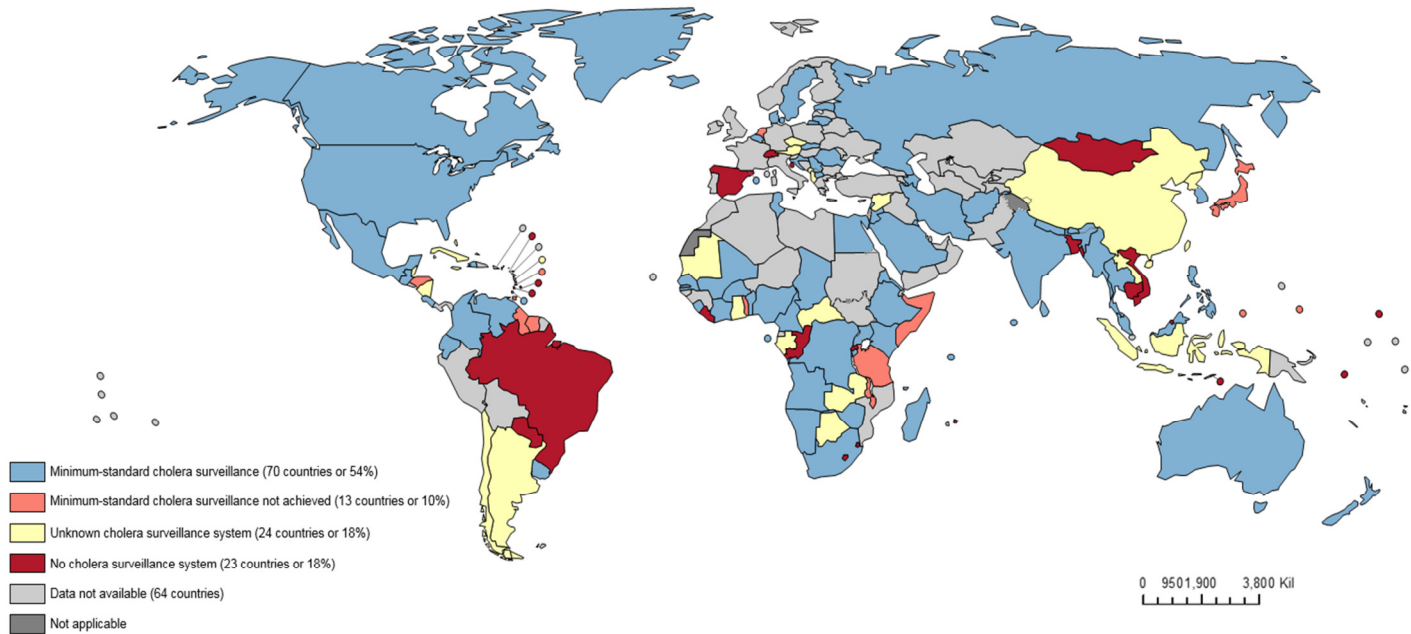
## Cholera

### Surveillance conducted by country



Of the 107 countries who report conducting cholera surveillance, 70 (65%) countries report having a nationwide, aggregate system in place. Of the 70 countries who report conducting surveillance that meets the minimum-standard requirements, 52 (74%) report conducting case-based, laboratory confirmed, national surveillance throughout the entire country.

### Minimum-standard surveillance



#### Minimum-standard:

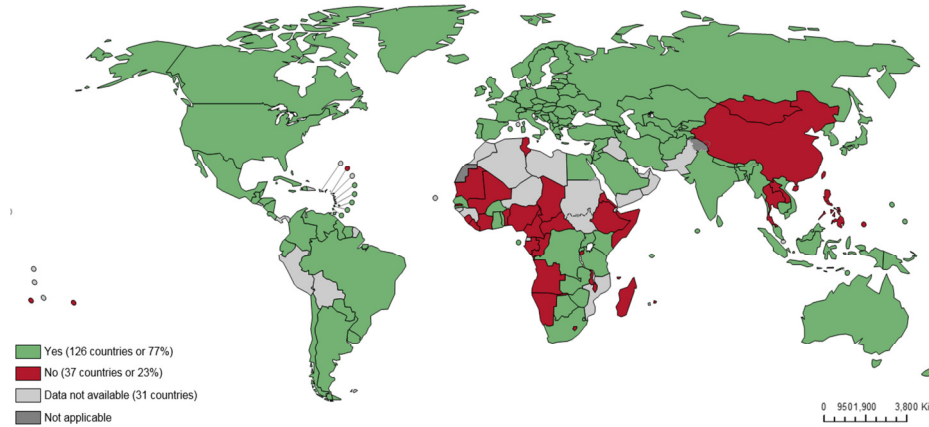
- *Aggregate*
- *Lab confirmed during outbreaks<sup>1</sup>*
- *Nationwide*

Of the 70 countries that report conducting cholera surveillance that meet the minimum-standard recommendations, 64 (91%) countries report having a system in place that has the ability to laboratory confirm suspected cases.

<sup>1</sup> Assumes countries that report not having the ability to lab confirm cholera are able to lab confirm during outbreaks (e.g. by sending samples out of the country).

## Congenital Rubella Syndrome (CRS)

### Surveillance conducted by country



Of the 126 countries reporting conducting CRS surveillance, 77 (47%) report conducting national, population-based, case-based surveillance with laboratory confirmation, while 18 (11%) countries report conducting surveillance that is sentinel, case-based, with laboratory confirmation.

Given the lack of surveillance in many countries, it is unsurprising that CRS is underreported.

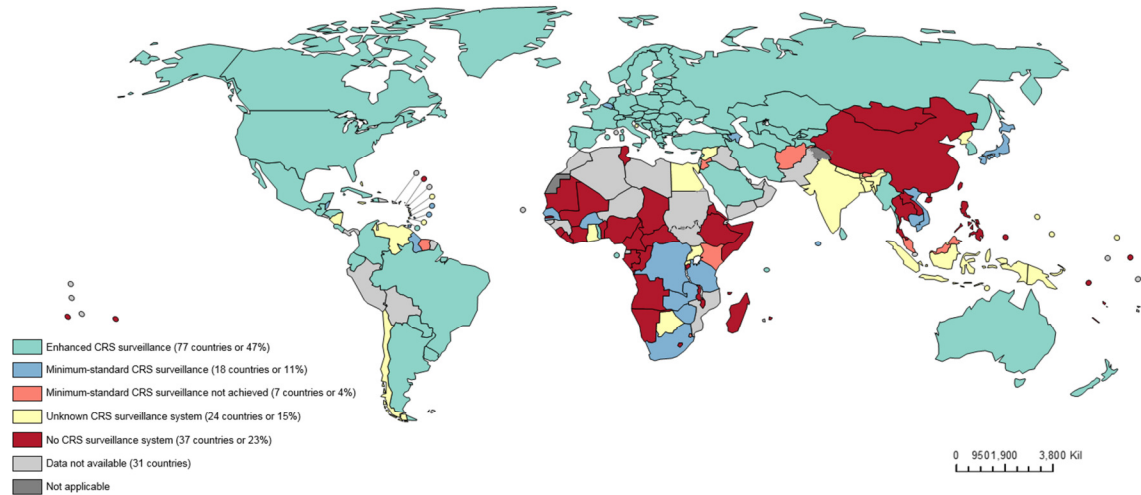
### Minimum-standard vs. enhanced surveillance

#### Minimum-standard:

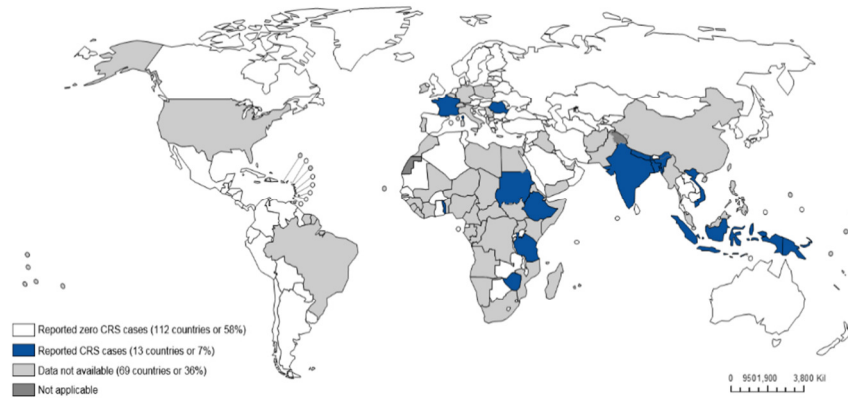
- Case-based
- Lab confirmed
- Sentinel

#### Enhanced:

- Case-based
- Lab confirmed
- Population-based



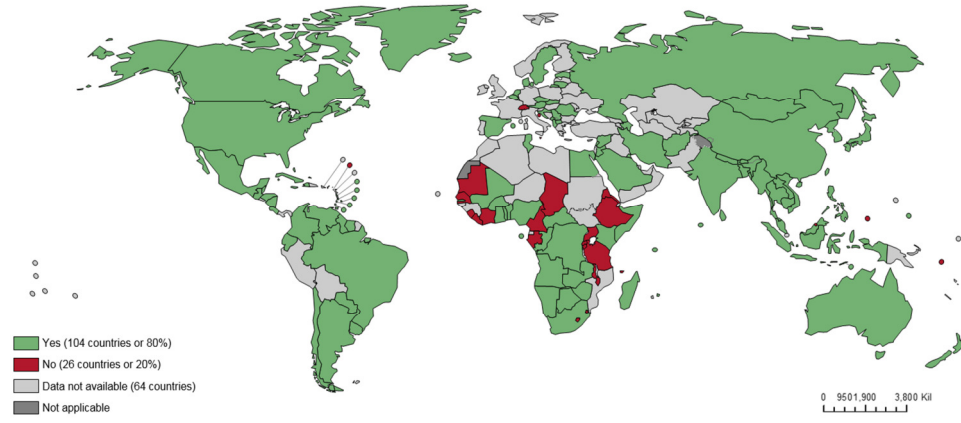
### CRS cases reported in 2016 JRF



Country	# of Cases
Bangladesh	87
Ethiopia	7
France	2
India	174
Indonesia	25
Nepal	33
Papua New Guinea	1
Romania	4
Sudan (the)	9
Togo	3
United Republic of Tanzania	1
Viet Nam	18
Zimbabwe	3

## Diphtheria

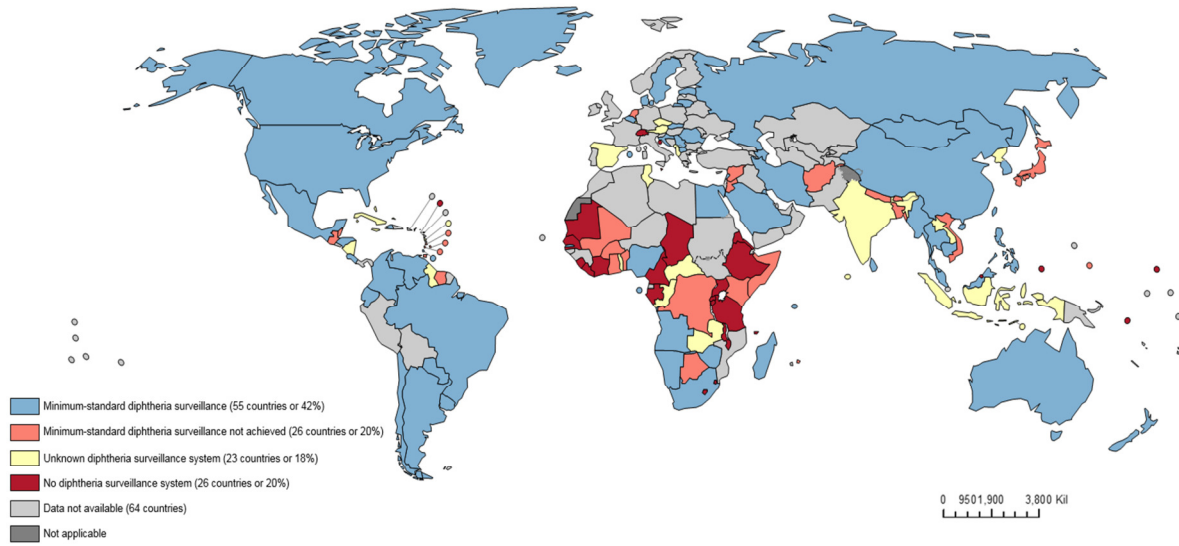
### Surveillance conducted by country



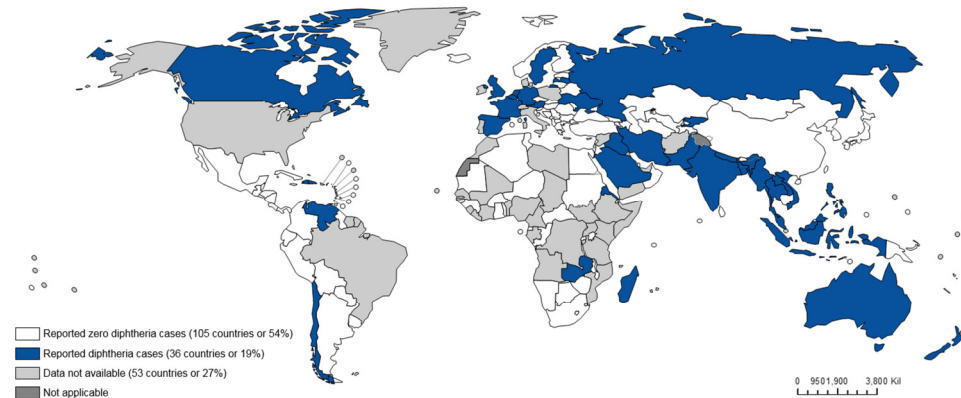
Of the 104 countries that report conducting diphtheria surveillance, only 55 (42%) countries report conducting case-based, national surveillance with lab confirmation, while 26 (20%) countries report conducting surveillance that does not meet the minimum-standards for a recommended diphtheria surveillance system.

### Minimum-standard surveillance

- Case-based
- Lab confirmed
- Nationwide



### Diphtheria cases reported in 2016 JRF

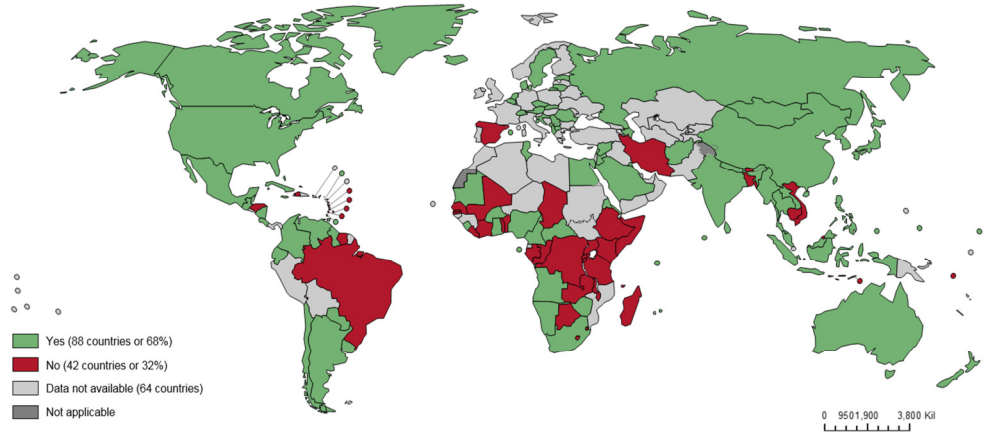


>100 Cases/Country	# of Cases
India	3380
Indonesia	342
Madagascar	2865
Myanmar	135
Nepal	140



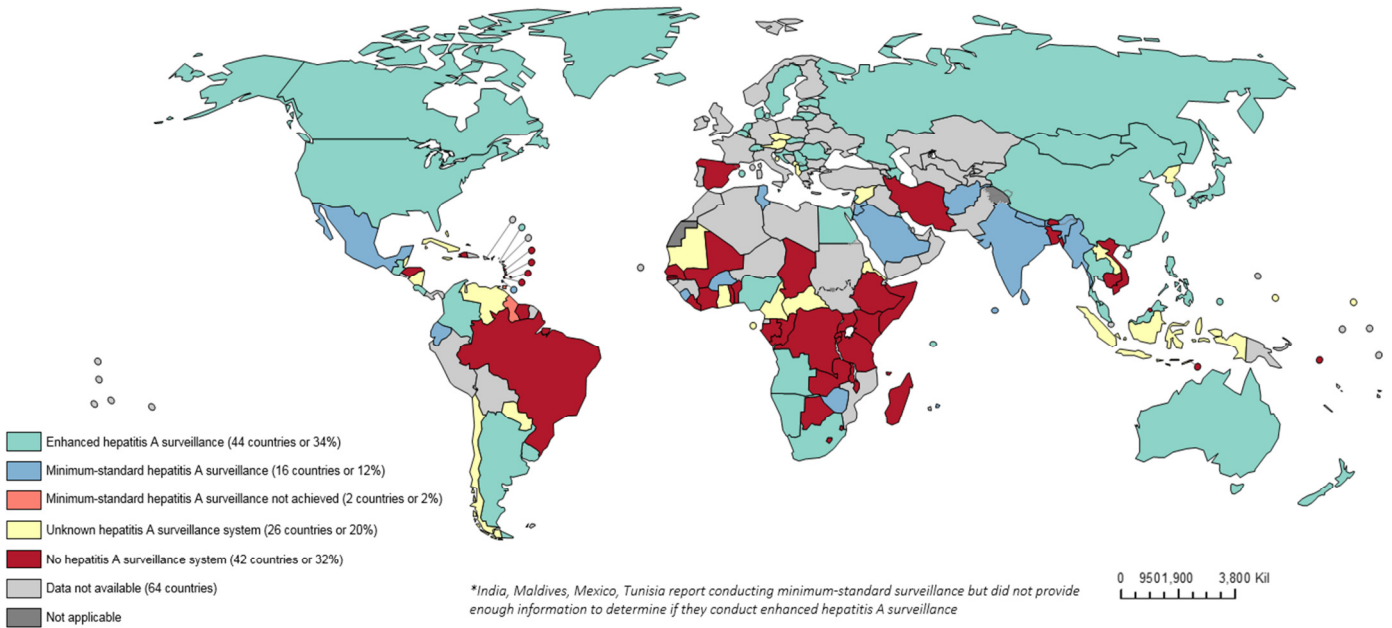
## Hepatitis A

### Surveillance conducted by country



Of the 88 countries that report conducting hepatitis A surveillance, only two countries report not being able to meet at least the minimum-standard surveillance requirements, while 44 (50%) countries report conducting enhanced hepatitis A surveillance.

### Minimum-standard vs. enhanced surveillance



#### Minimum-standard:

- Aggregate
- Lab confirmed during outbreaks<sup>1</sup>
- Nationwide

#### Enhanced:

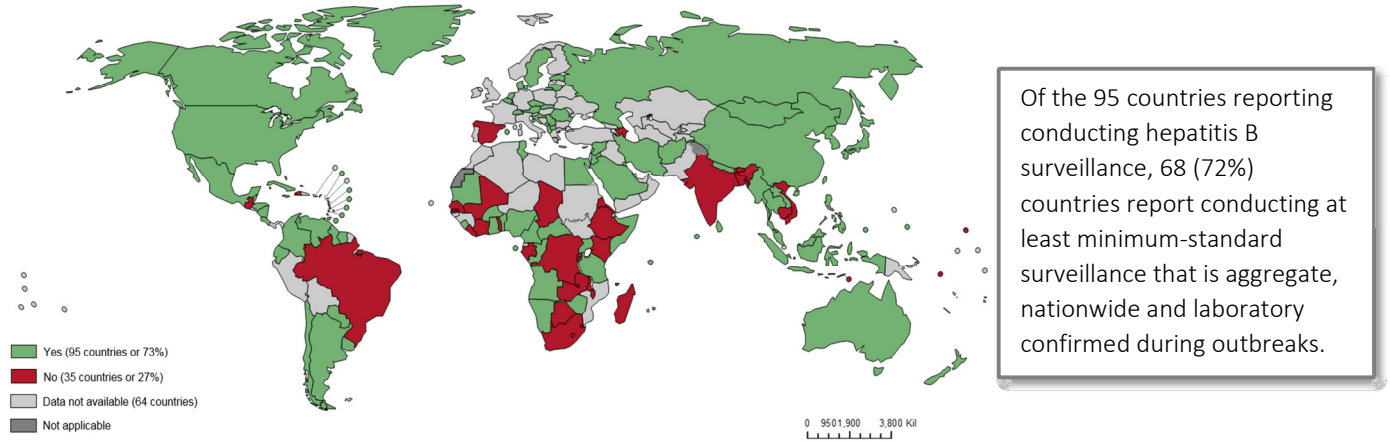
- Case-based
- Lab confirmed
- Sentinel or nationwide

Of the 16 countries that report conducting minimum-standard surveillance, 8 (50%) did not meet enhanced requirements because they report only conducting aggregate surveillance.

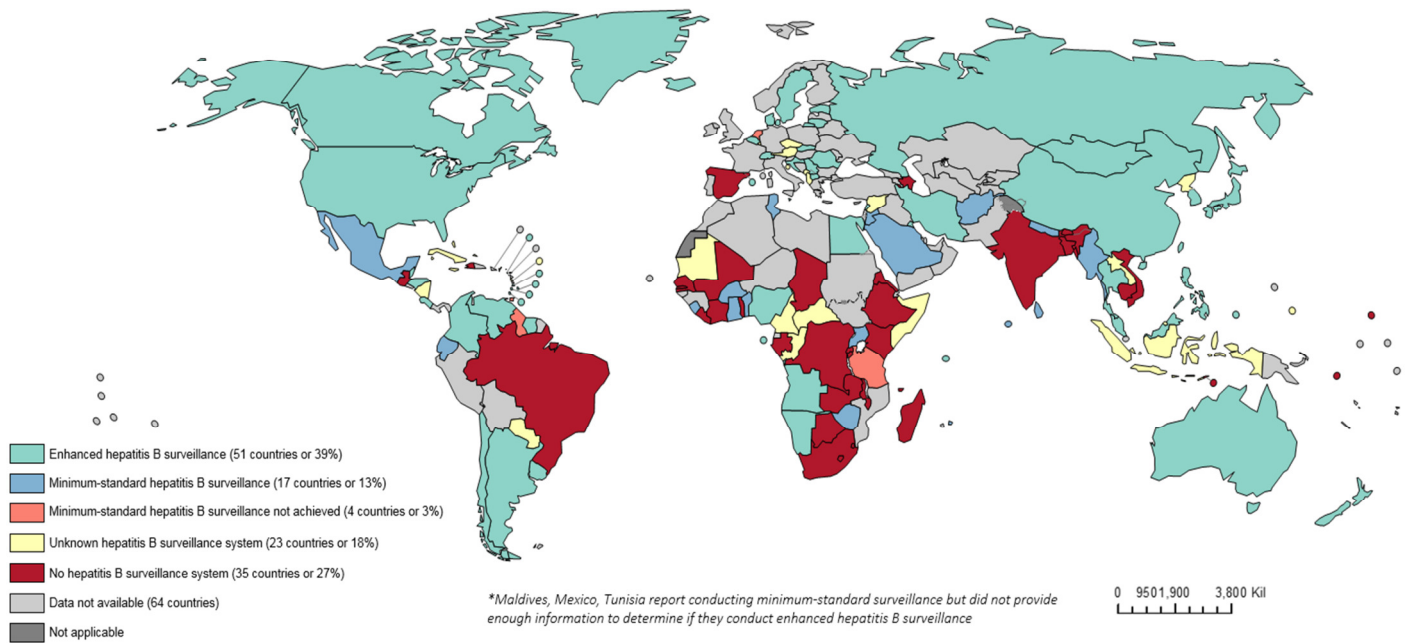
<sup>1</sup> Assumes countries that report not having the ability to lab confirm hepatitis A are able to lab confirm during outbreaks (e.g. by sending samples out of the country).

## Hepatitis B

### Surveillance conducted by country



### Minimum-standard vs. enhanced surveillance



#### Minimum-standard:

- Aggregate
- Lab confirmed during outbreaks<sup>1</sup>
- Nationwide

#### Enhanced:

- Case-based
- Lab confirmed
- Sentinel or nationwide

Of the 17 countries that report conducting minimum-standard surveillance, 12 (71%) did not meet enhanced requirements because they report only conducting aggregate surveillance.

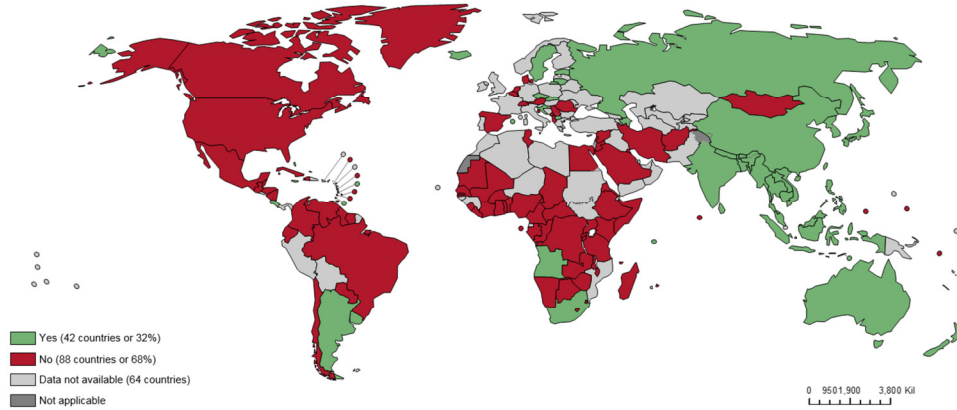
<sup>1</sup> Assumes countries that report not having the ability to lab confirm hepatitis B are able to lab confirm during outbreaks (e.g. by sending samples out of the country).

## ***Influenza***

*Data is currently being collected and a link to the information will be provided when available.*

## Japanese encephalitis (JE)

### Surveillance conducted by country



Of the 24 member states at risk of JE virus<sup>1</sup>, 21 responded to the surveillance questionnaire. Of these countries, 21 (100%) reported conducting JE surveillance:

- 4 (19%) countries reported conducting minimum-standard surveillance,
- 2 (10%) countries reported conducting surveillance that does not meet the minimum recommended standards,
- 7 (33%) countries reported conducting enhanced surveillance,
- 8 (38%) countries did not provide enough information to classify.

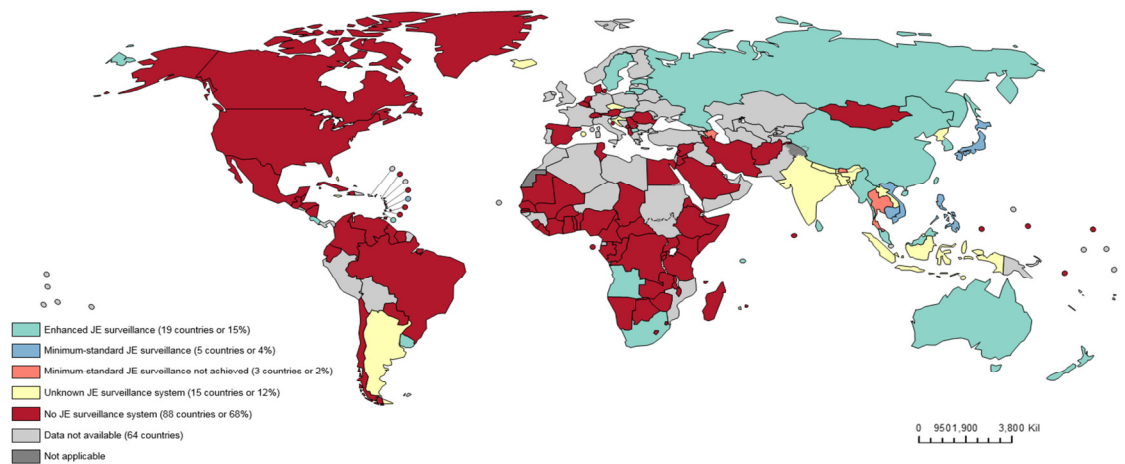
### Minimum-standard vs. enhanced surveillance

#### Minimum-standard:

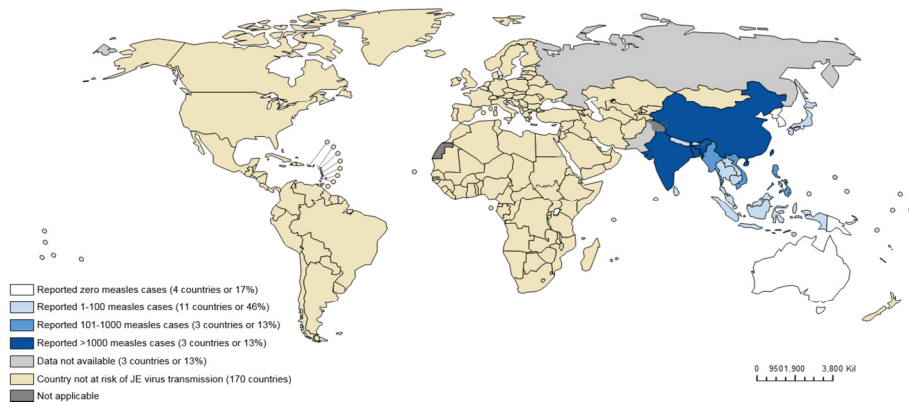
- Case-based
- Lab confirmed
- Sentinel

#### Enhanced:

- Case-based
- Lab confirmed
- Nationwide



### Cases reported in 2016 among endemic JE countries (n=24 MS)



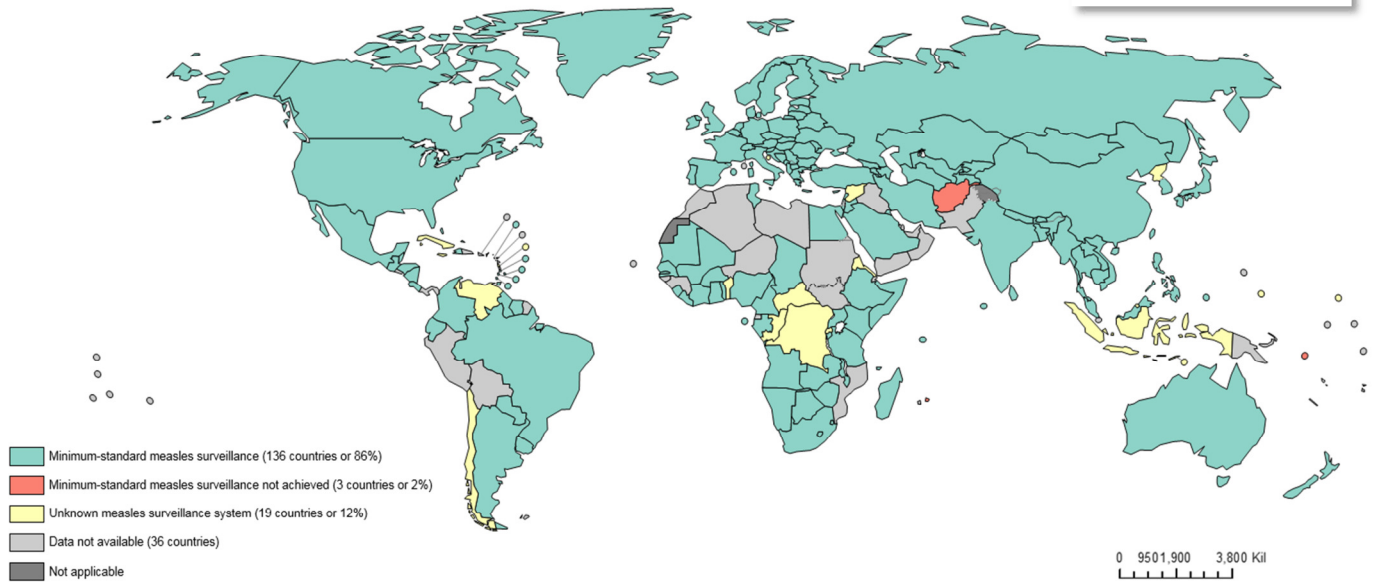
>100 Cases/Country	# of Cases
Bangladesh	1294
China	1130
India	1627
Myanmar	393
Philippines (the)	312
Viet Nam	357

<sup>1</sup> MS with high risk of JE transmission: Australia, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, Democratic People's Republic of Korea (the), India, Indonesia, Japan, Lao People's Democratic Republic (the), Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines (the), Republic of Korea (the), Russian Federation (the), Singapore, Sri Lanka, Thailand, Timor-Leste, Viet Nam.

# Measles

## Minimum-standard surveillance conducted by country

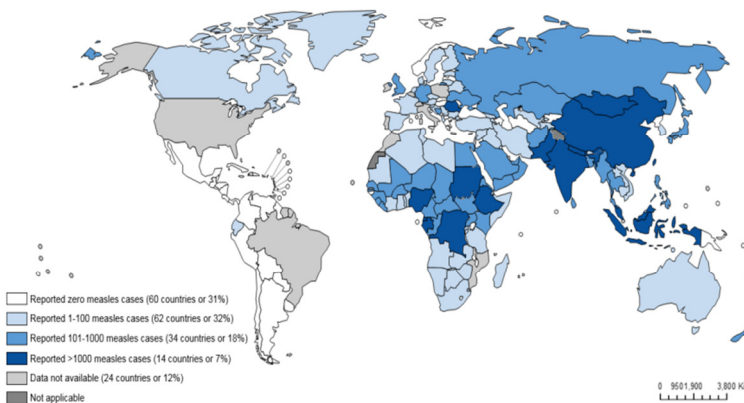
**Minimum-standard:**  
 → Case-based  
 → Lab confirmed  
 → Population-based  
 → Nationwide



All 194 WHO member states report conducting measles surveillance. Case-based, population-based, national surveillance with laboratory confirmation is reported to be conducted in 136/158 (88%) countries.

- Mauritius reports conducting aggregate, population-based, national surveillance with laboratory confirmation;
- Solomon Islands report conducting case-based, sentinel surveillance with laboratory confirmation;
- Afghanistan reports conducting partial case-based, sentinel surveillance with laboratory confirmation.

## Measles cases reported in the 2016 JRF



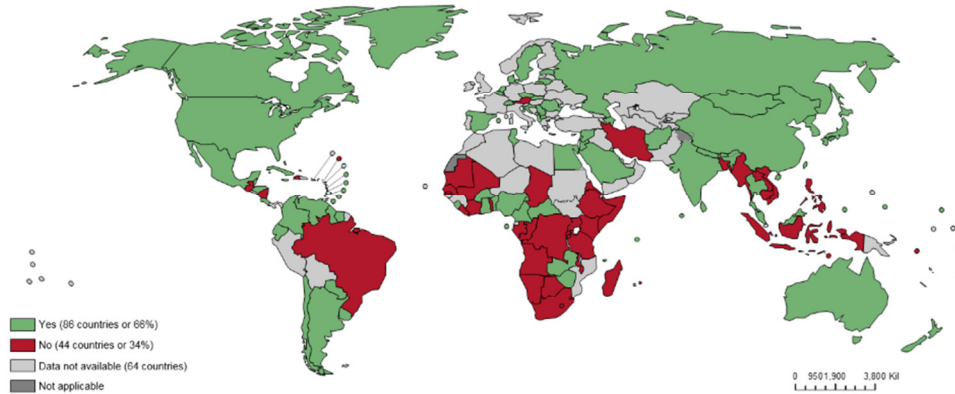
### >1000 Cases/Country

### # of Cases

China	24820
Democratic Republic of the Congo (the)	5092
Ethiopia	4579
Gabon	1509
Equatorial Guinea	1699
Indonesia	6962
India	17250
Mongolia	30273
Malaysia	1569
Nigeria	17136
Nepal	1269
Pakistan	2702
Romania	2435
Sudan (the)	1767

## Mumps

### Surveillance conducted by country



Of the 86 countries who report conducting mumps surveillance, 67 (78%) report meeting at least the minimum surveillance standards.

Of the 24 countries who report conducting minimum-surveillance standards but do not meet the requirements for conducting enhanced surveillance, 18 countries report conducting aggregate surveillance, while 15 countries reporting not lab confirming suspect cases.

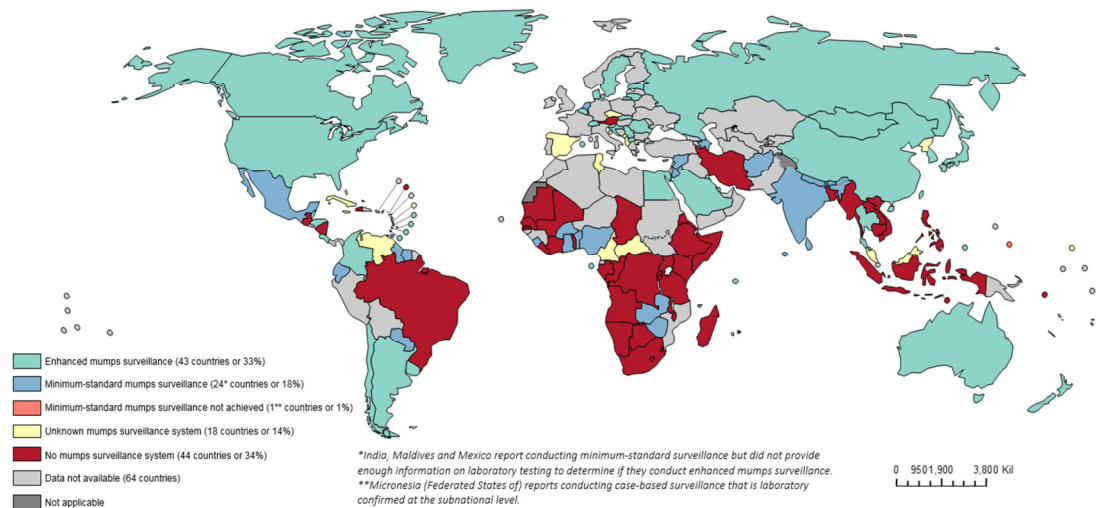
### Minimum-standard vs. enhanced surveillance

#### Minimum-standard:

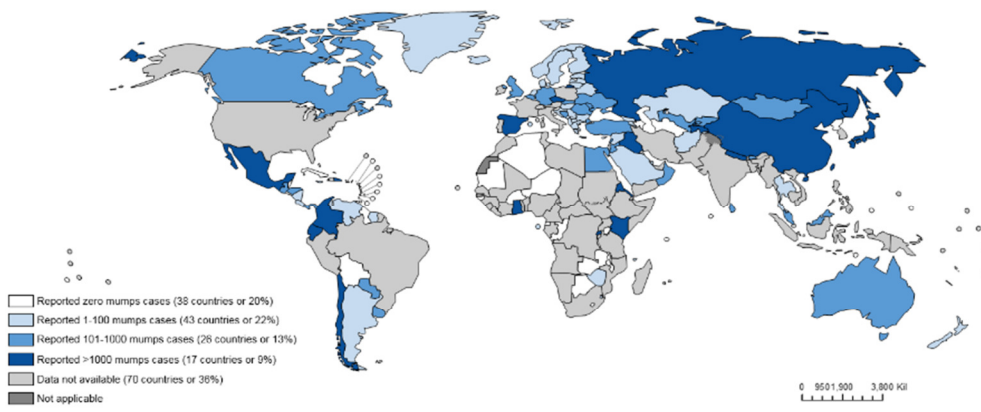
- Aggregate
- Lab confirmed during outbreaks<sup>1</sup>
- Nationwide

#### Enhanced:

- Case-based
- Lab confirmed
- Nationwide



### Mumps cases reported in 2016 JRF

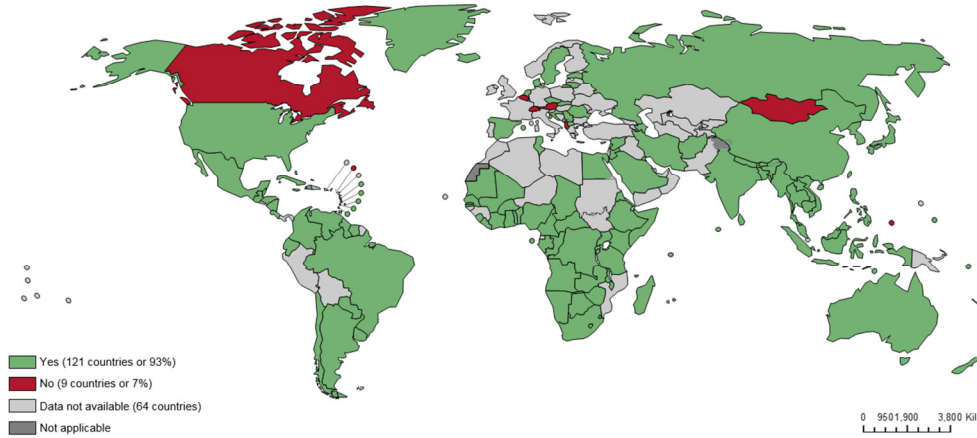


>10000 Cases/Country	# of Cases
China	175001
Colombia	10452
Ghana	16320
Iraq	73939
Japan	159031
Kenya	80960
Nepal	30610

<sup>1</sup> Assumes countries that report not having the ability to lab confirm mumps are able to lab confirm during outbreaks (e.g. by sending samples out of the country).

## Neonatal tetanus

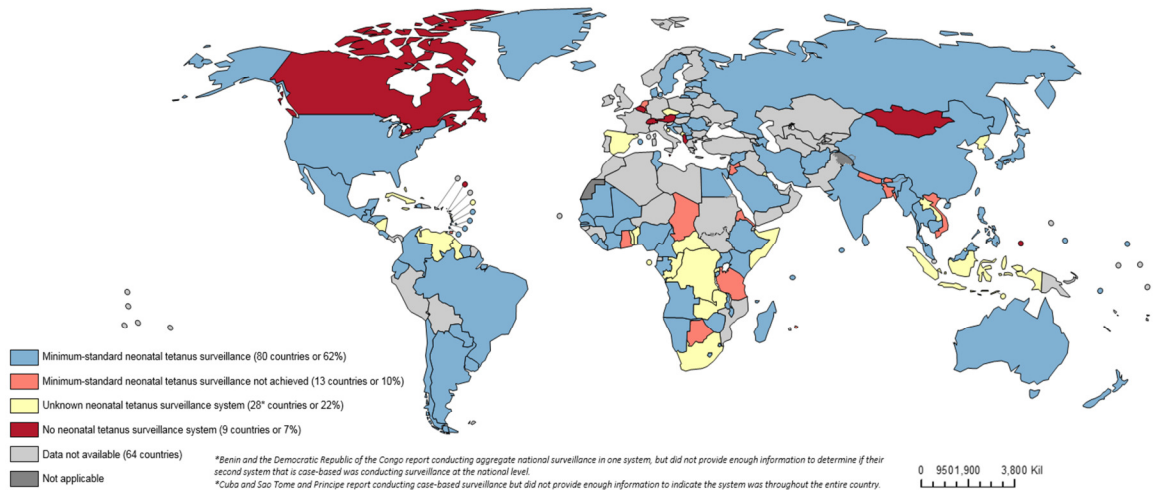
### Surveillance conducted by country



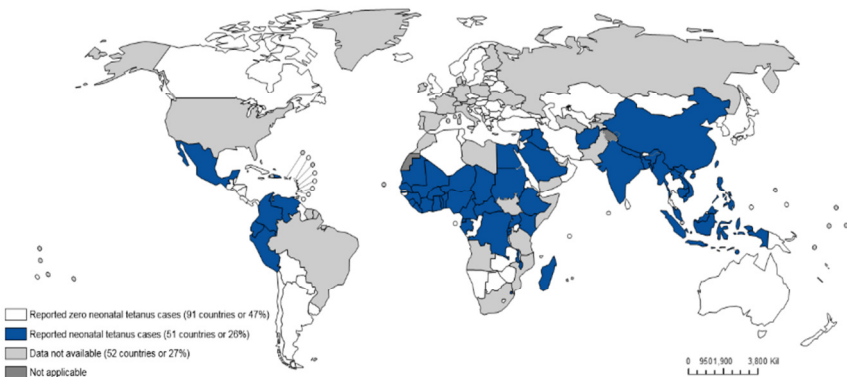
Of the 121 countries who report conducting neonatal tetanus surveillance, 13 do not meet the minimum recommended surveillance standards because they report conducting aggregate surveillance.

### Minimum-standard surveillance

- Case-based
- Nationwide

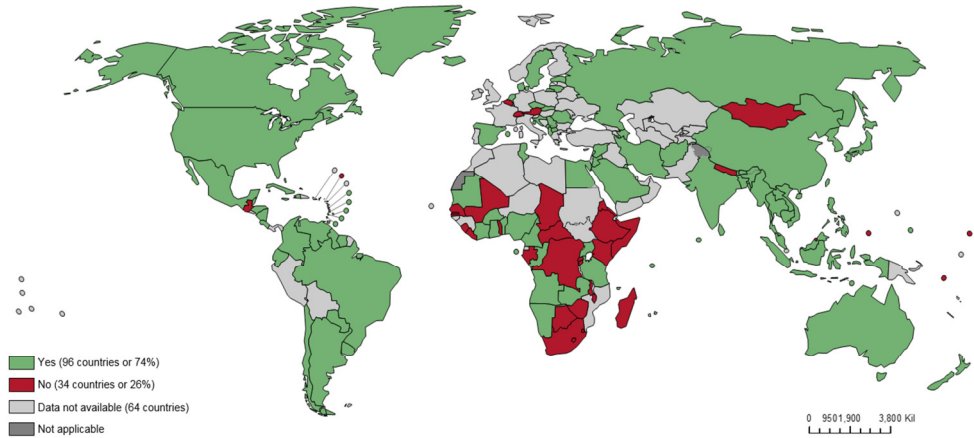


### Neonatal tetanus cases reported in 2016 JRF



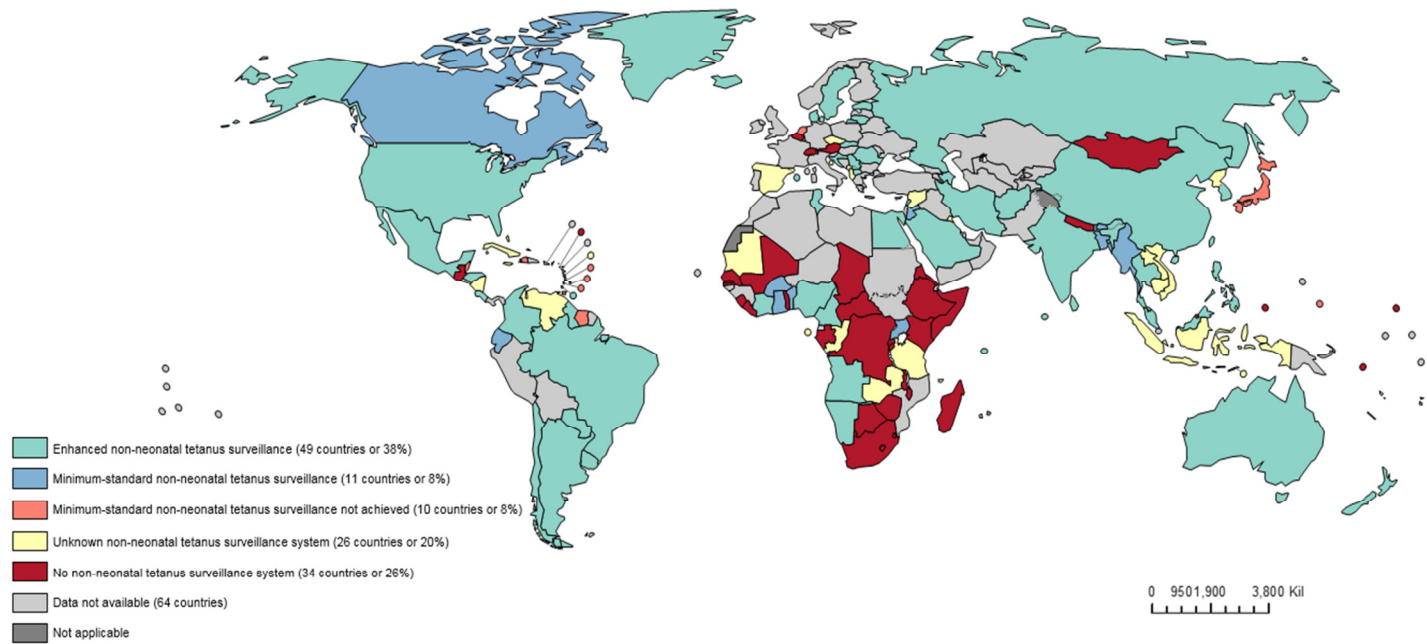
>50 Cases/Country	# of Cases
Bangladesh	110
Central African Republic (the)	208
China	177
Cameroon	58
Democratic Republic of the Congo (the)	80
Guinea	113
India	227
Kenya	317
Philippines (the)	85
Sudan (the)	62
Chad	172
Uganda	73

## Non-neonatal tetanus Surveillance conducted by country



Of the 96 countries that report conducting non-neonatal tetanus surveillance, 11 (12%) countries report conducting aggregate non-neonatal tetanus surveillance throughout the entire country, while 49 (51%) countries report conducting case-based, nationwide non-neonatal tetanus surveillance.

## Minimum-standard vs. enhanced surveillance



### Minimum-standard:

- Aggregate
- Nationwide

### Enhanced:

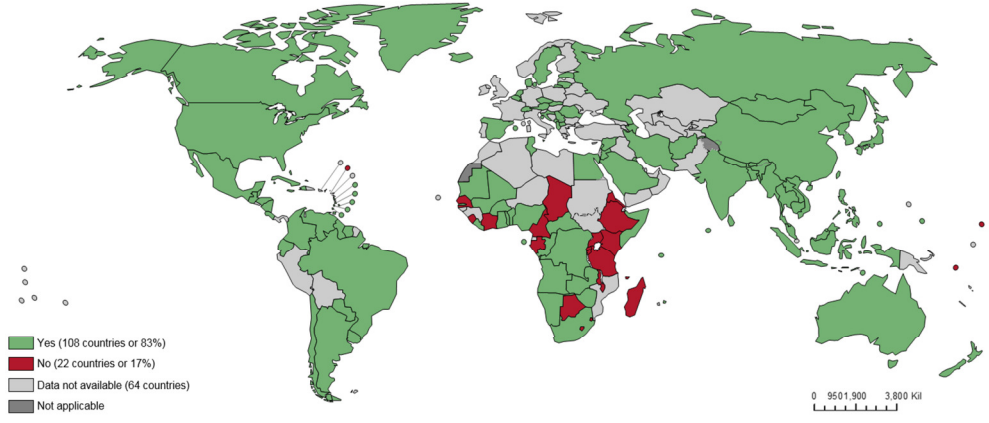
- Case-based
- Nationwide

Of the 10 countries that do not report conducting minimum-standard non-neonatal tetanus surveillance, all (100%) report conducting surveillance that is sentinel.



## Pertussis

### Surveillance conducted by country



Of the 108 countries that report conducting pertussis surveillance, 23 (18%) countries report not having, at a minimum, a case-based sentinel surveillance system that laboratory confirms suspect cases. Of these 23 countries, 15 report conducting pertussis surveillance that is aggregate and 13 report not laboratory confirming suspect cases.

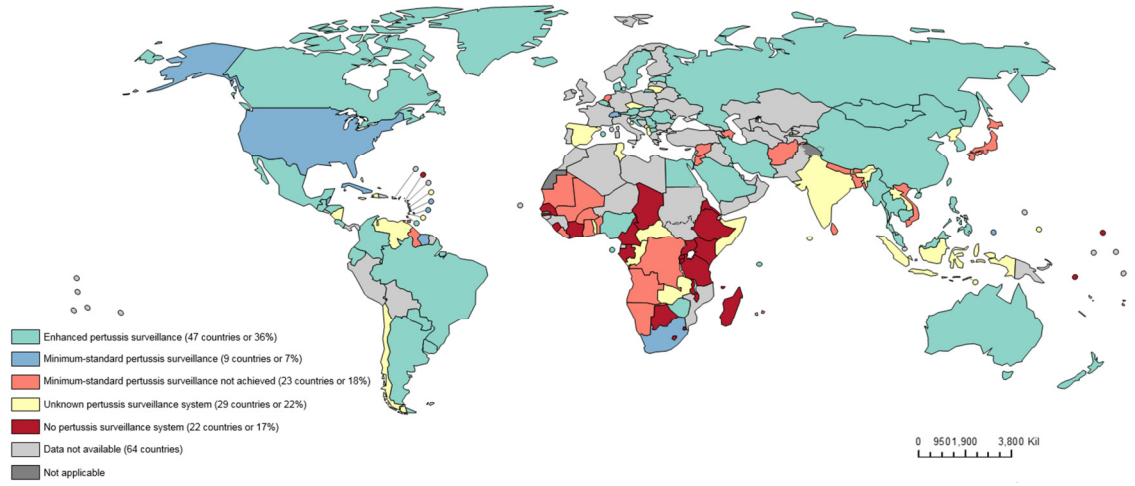
### Minimum-standard vs. enhanced surveillance

#### Minimum-standard:

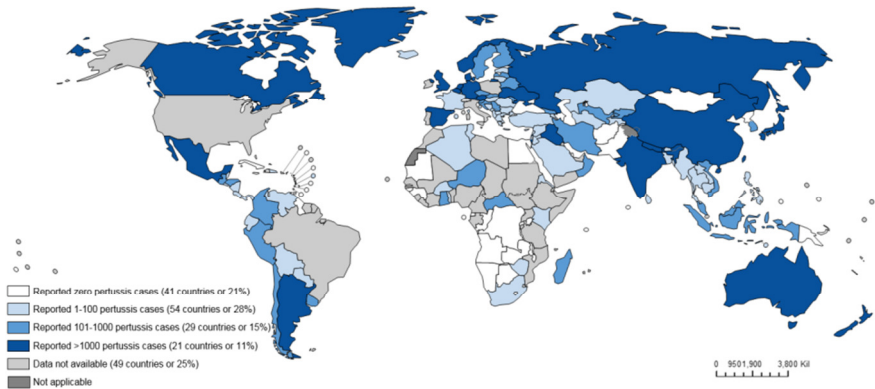
- Case-based
- Lab confirmed
- Sentinel

#### Enhanced:

- Case-based
- Lab confirmed
- Nationwide



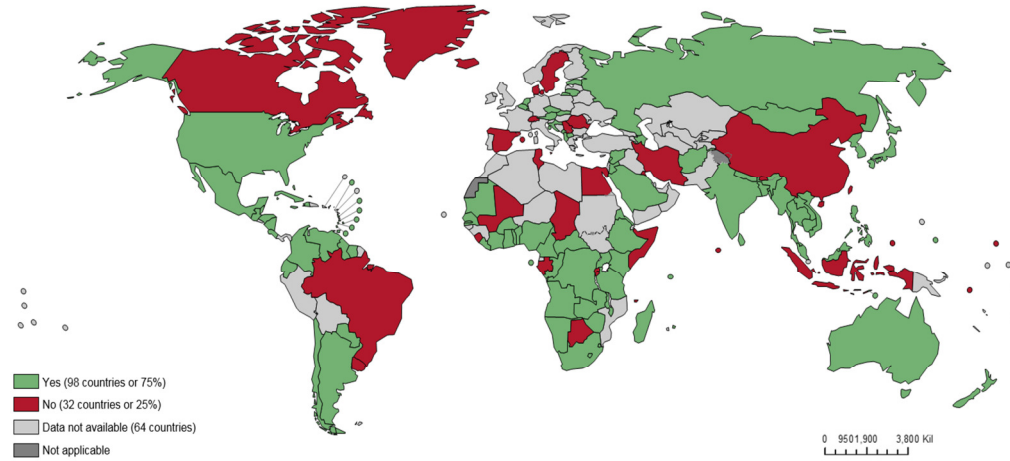
### Pertussis cases reported in 2016 JRF



>5000 Cases/Country	# of Cases
Australia	20037
China	5584
Germany	13809
UK of Great Britain and Northern Ireland (the)	7085
India	37274
Russian Federation (the)	8232

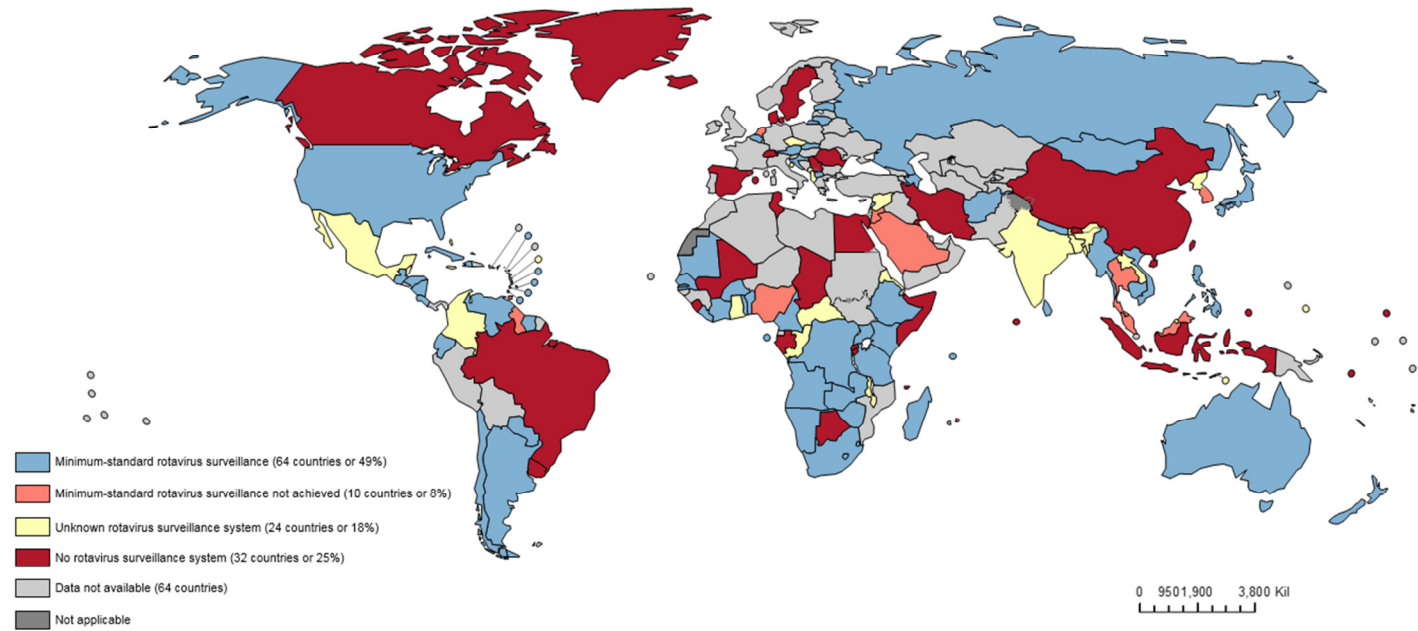
## Rotavirus

### Surveillance conducted by country



Of the 98 (75%) countries who report conducting rotavirus surveillance, 64 countries report conducting case-based, laboratory confirmed surveillance in sentinel sites. Among the 64 countries that report conducting minimum-standard rotavirus surveillance, 22 (34%) report conducting case-based, laboratory confirmed surveillance that is population-based.

### Minimum-standard surveillance



### Minimum-standard:

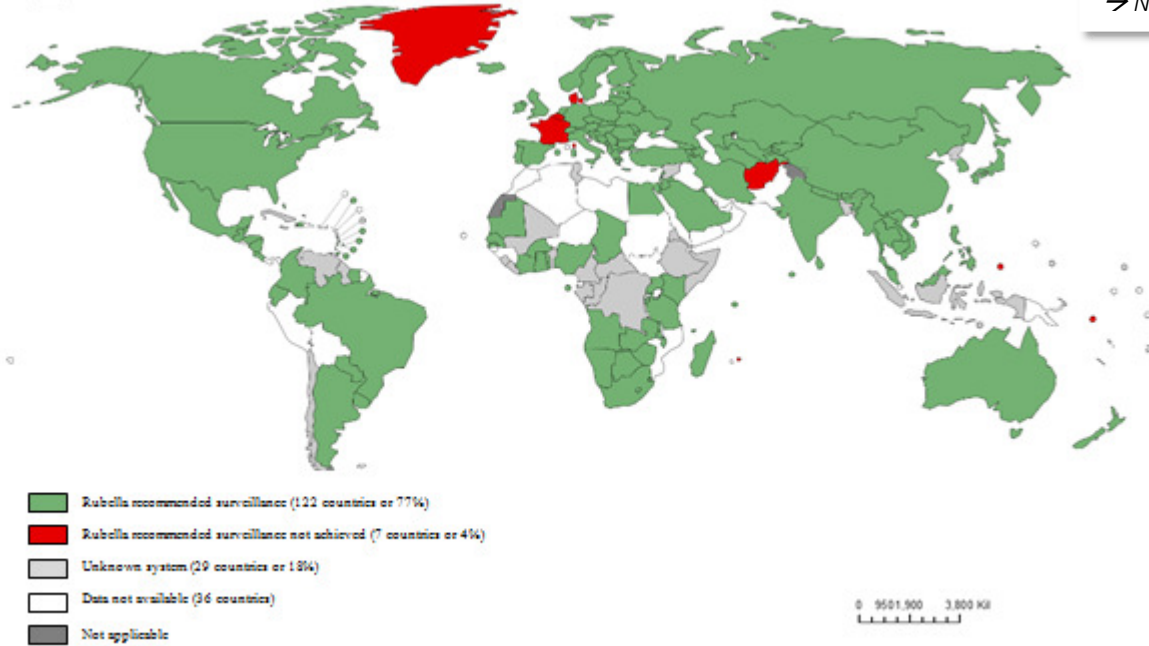
- Case-based
- Lab confirmed
- Sentinel

Of the 10 (8%) countries who report not conducting case-based, laboratory confirmed, sentinel rotavirus surveillance, 100% of these countries report conducting rotavirus surveillance that is aggregate.

## Rubella

### Minimum-standard surveillance conducted by country

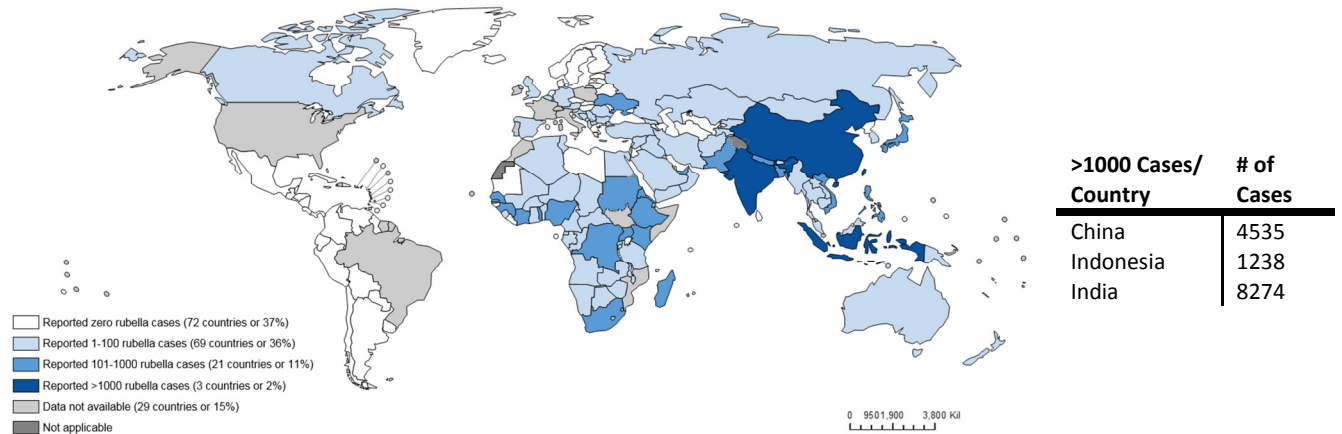
**Minimum-standard:**  
 → Case-based  
 → Lab confirmed  
 → Population-based  
 → Nationwide



All 194 WHO member states report conducting rubella surveillance. Case-based, population-based, national surveillance with laboratory confirmation is reported to be conducted in 121/158 (77%) countries.

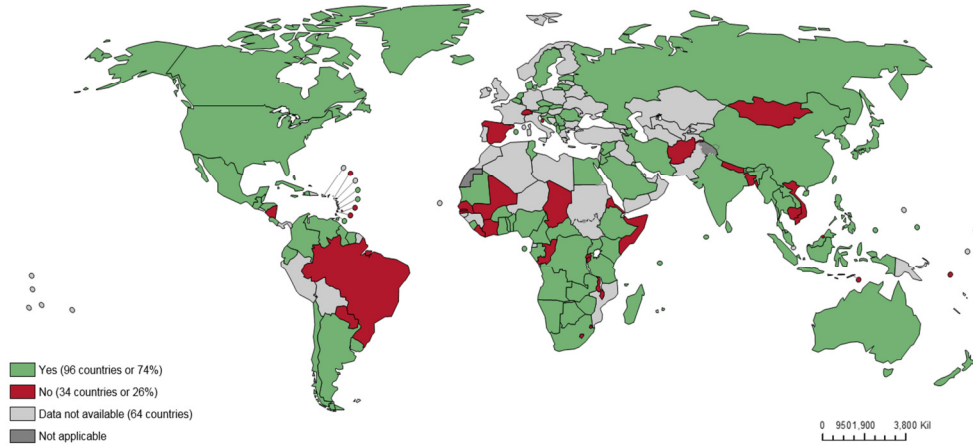
- Mauritius report conducting aggregate, population-based national surveillance with laboratory confirmation;
- Palau and the Solomon Islands report conducting case-based, sentinel national surveillance with laboratory confirmation;
- Afghanistan reports conducting partial case-based, sentinel, national surveillance with laboratory confirmation;
- Belgium, Denmark and France report conducting rubella surveillance only among pregnant women.

### Rubella cases reported in 2016 JRF



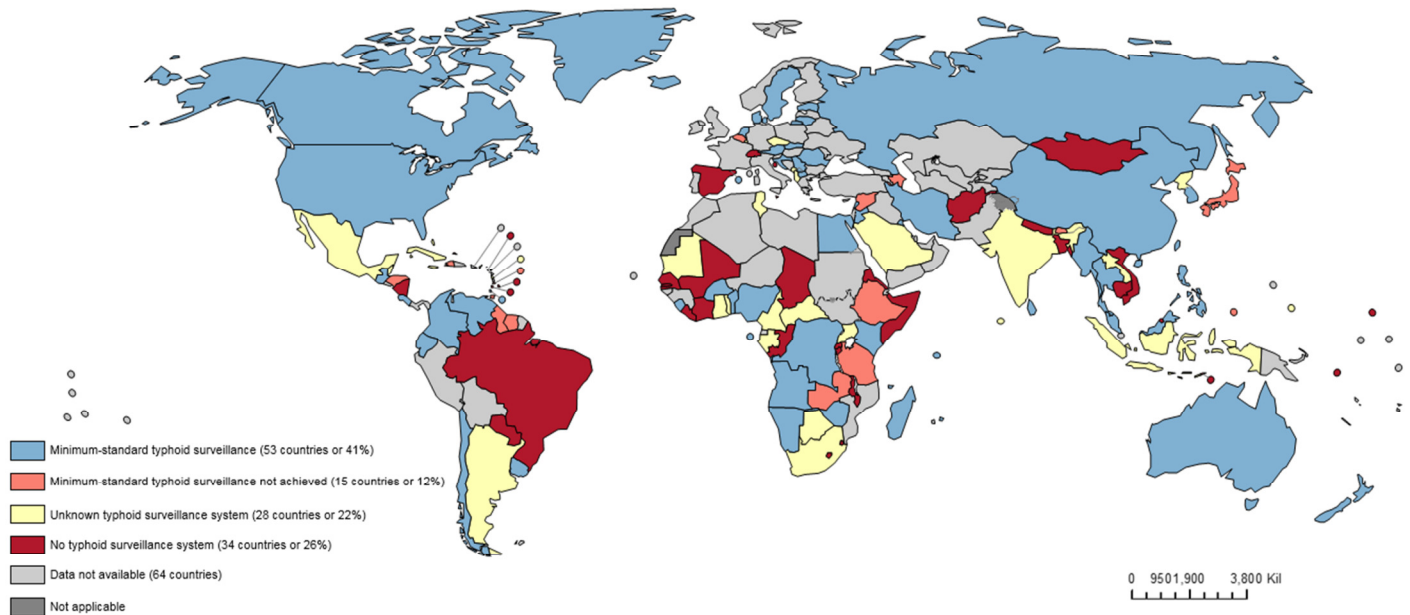
## Typhoid

### Surveillance conducted by country



Of the 96 countries who report conducting typhoid surveillance, 53 (55%) countries report having a nationwide, aggregate system that laboratory confirms suspect cases in place. Of the 53 countries who report conducting surveillance that meets the minimum-standard requirements, 41 (77%) report conducting case-based, laboratory confirmed, national surveillance throughout the entire country.

### Minimum-standard surveillance



#### Minimum-standard:

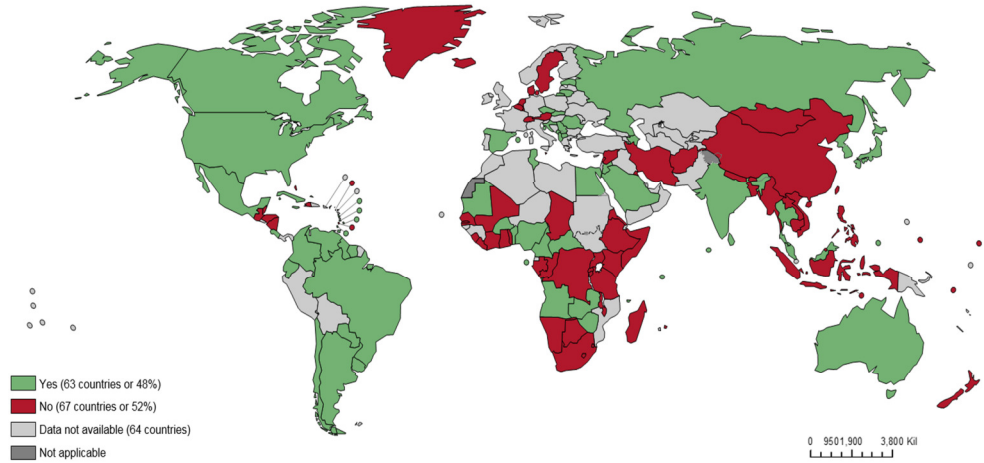
- *Aggregate*
- *Lab confirmed*
- *Nationwide*

Of the 53 (41%) countries that report conducting minimum-standard typhoid surveillance, 41 countries report conducting case-based, laboratory confirmed, population-based surveillance throughout the entire country.

Of the 15 (12%) countries that report not having a nationwide, aggregate surveillance system that laboratory confirms suspect cases, 12 (80%) report conducting sentinel or subnational surveillance.

## Varicella

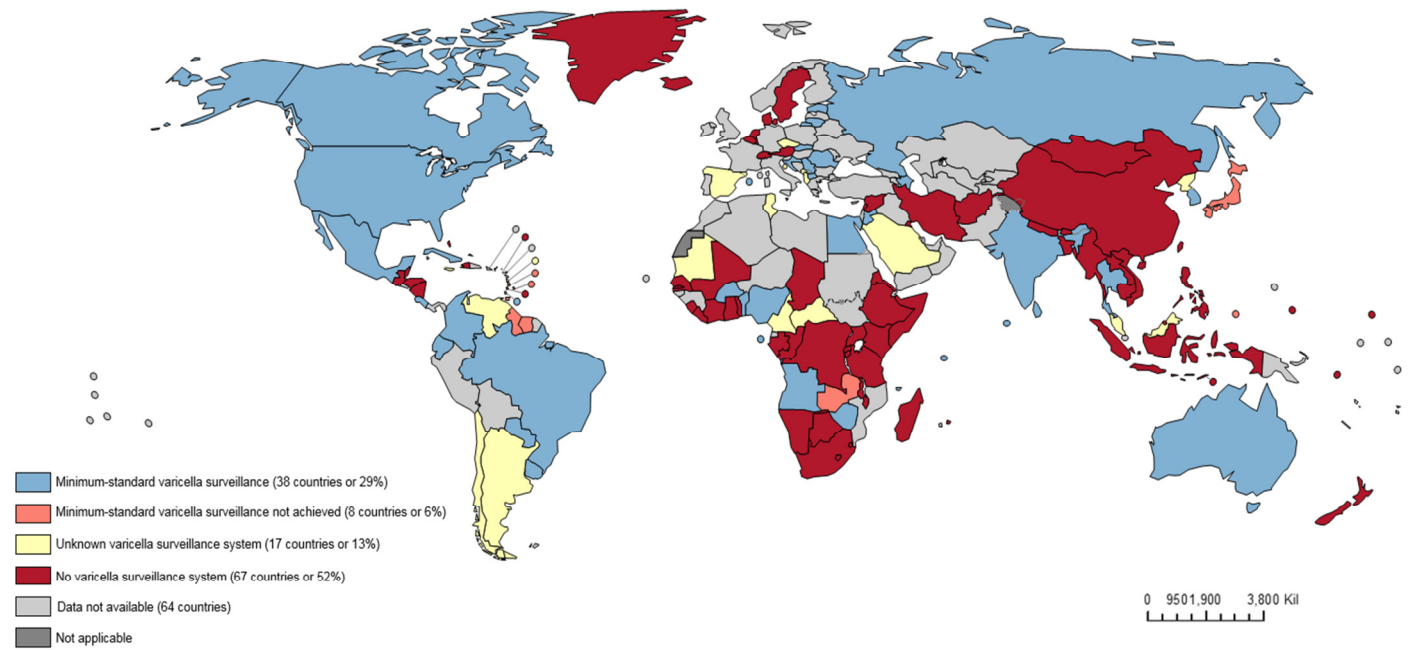
### Surveillance conducted by country



Of the 63 countries who report conducting varicella surveillance, 37 (59%) countries report having a nationwide, aggregate system in place.

Of the 67 countries who report not conducting varicella surveillance, 27 (40%) of these countries are located in the African region.

### Minimum-standard surveillance



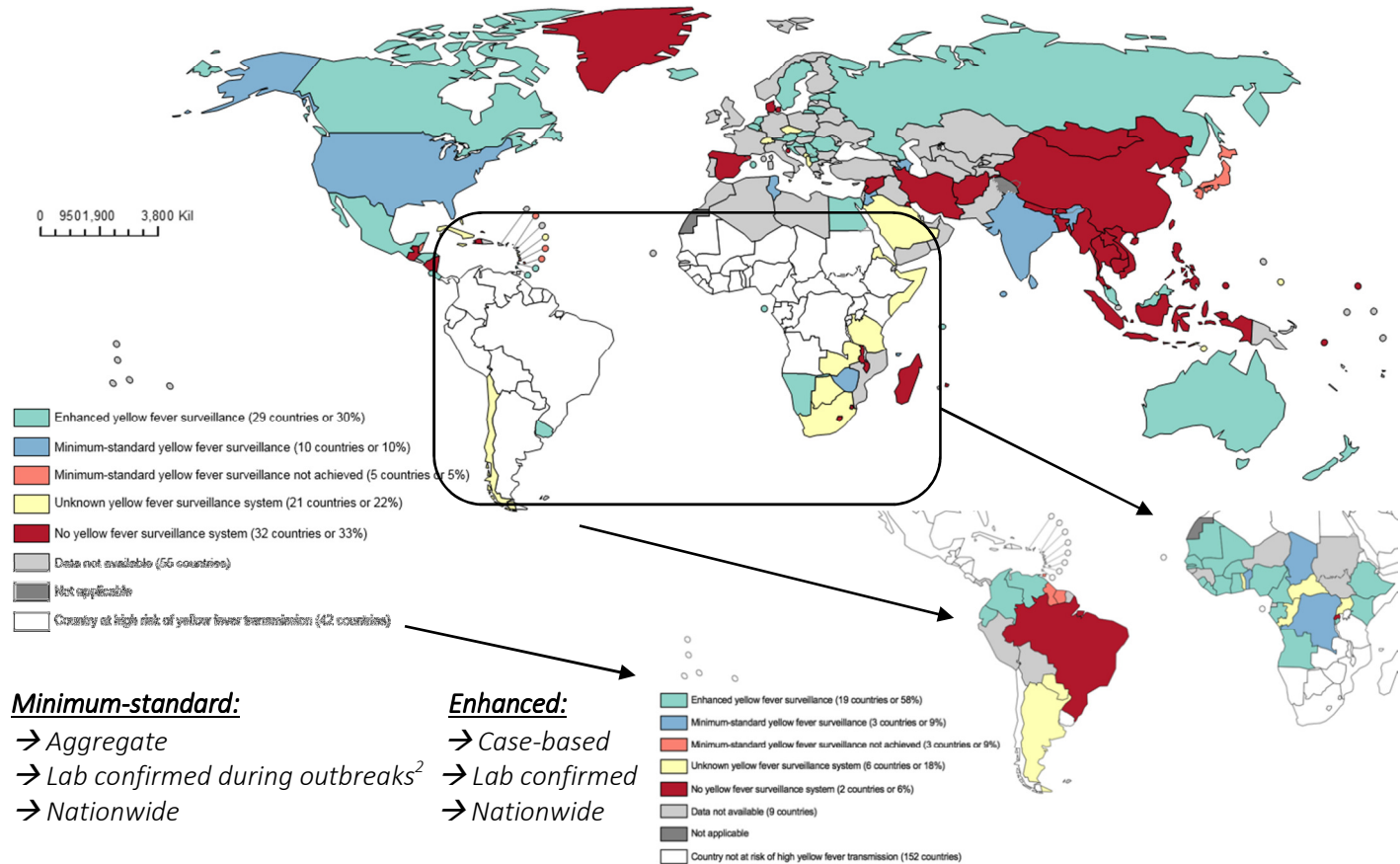
#### Minimum-standard:

- *Aggregate*
- *Subnational or nationwide*

Of the 38 countries who report conducting surveillance that meets the minimum-standard requirements, 20 (53%) report conducting either case-based, laboratory confirmed, population-based surveillance throughout the entire country.

## Yellow Fever (YF)<sup>1</sup> Minimum-standard vs. enhanced surveillance

Of the 42 countries at high-risk of YF transmission, 19 (58%) report conducting nationwide, case-based surveillance that laboratory confirms suspect YF cases.



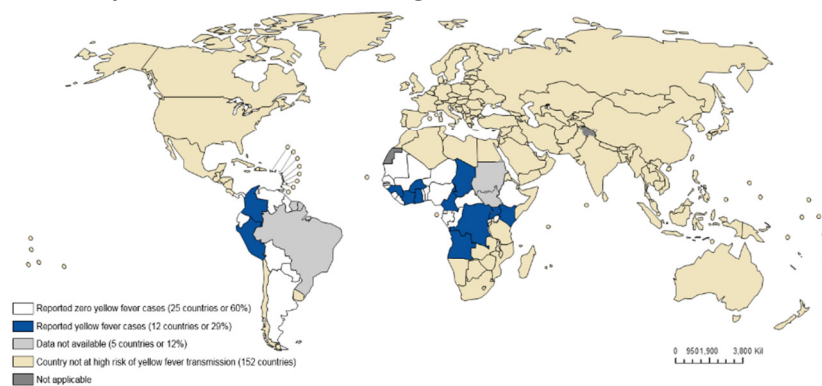
**Minimum-standard:**

- Aggregate
- Lab confirmed during outbreaks<sup>2</sup>
- Nationwide

**Enhanced:**

- Case-based
- Lab confirmed
- Nationwide

### Cases reported in 2016 JRF among endemic YF countries



Country	# of Cases
Angola	881
Burkina Faso	1
Canada	2
Côte d'Ivoire	3
Cameroon	61
Democratic Republic of the Congo (the)	77
Colombia	6
Ghana	1
Guinea	4
Israel	1
Kenya	3
Peru	62
Chad	1
Uganda	8

<sup>1</sup> Countries with risk of yellow fever virus transmission: Angola, Argentina, Benin, Bolivia, Brazil, Burkina Faso, Burundi, Cameroon, Colombia, Central African Republic, Chad, The Republic of Congo, Colombia, Côte d'Ivoire, Democratic Republic of Congo, Equatorial Guinea, Ethiopia, Ecuador, French Guiana, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Guyana, Kenya, Liberia, Mauritania, Mali, Nigeria, Panama, Paraguay, Peru, Senegal, Sierra Leone, South Sudan, Sudan, Suriname, Togo, Trinidad and Tobago, Togo, Uganda, Venezuela.

<sup>2</sup> Assumes countries that report not having the ability to lab confirm YF are able to lab confirm during outbreaks (e.g. by sending samples out of the country).

## Surveillance by country, as reported

Country	Cholera	CRS	Diphtheria	Hepatitis A	Hepatitis B	Japanese encephalitis	Measles	Mumps	Neonatal tetanus	Non-neonatal tetanus	Pertussis	Rotavirus	Rubella	Typhoid	Varicella	Yellow fever
Afghanistan	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗
Albania	✓	✓	✓	✓	✓	✗	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓
Algeria																
Andorra	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓
Angola	✓	✗	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓
Antigua and Barbuda																
Argentina	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Armenia		✓					✓						✓			
Australia	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Austria	✓	✓	✓	✓	✓	✗	✓	✗	✗	✗	✓	✓	✓	✓	✓	✓
Azerbaijan	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bahamas (the)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓
Bahrain	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bangladesh	✗	✓	✓	✗	✗	✓	✓	✗	✓	✓	✓	✓	✓	✗	✗	✗
Barbados	✗	✓	✓	✗	✓	✗	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓
Belarus		✓					✓						✓			
Belgium	✓	✓	✓	✓	✓	✗	✓	✓	✗	✗	✓	✓	✓	✓	✗	✓
Belize	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓
Benin	✓	✗	✓	✗	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bhutan	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	✗	✓	✓	✗	✗
Bolivia (Plurinational State of)																
Bosnia and Herzegovina		✓					✓						✓			
Botswana	✓	✓	✓	✗	✗	✗	✓	✗	✓	✗	✗	✗	✓	✓	✗	✓
Brazil	✗	✓	✓	✗	✗	✗	✓	✗	✓	✓	✓	✗	✓	✗	✓	✗
Brunei Darussalam	✗	✓	✗	✗	✓	✓	✓	✓	✗	✓	✓	✓	✓	✗	✗	✓
Bulgaria		✓					✓						✓			
Burkina Faso	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Burundi	✓	✗	✗	✗	✗	✗	✓	✗	✓	✗	✗	✗	✓	✗	✗	✓
Cambodia	✗	✓	✓	✗	✗	✓	✓	✗	✓	✓	✓	✓	✓	✗	✗	✗
Cameroon	✓	✗	✗	✓	✓	✗	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓
Canada	✓	✓	✓	✓	✓	✗	✓	✓	✗	✓	✓	✗	✓	✓	✓	✓
Cape Verde																
Central African Republic (the)	✓	✗	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓
Chad	✓	✗	✗	✗	✗	✗	✓	✗	✓	✗	✗	✗	✓	✗	✗	✓
Chile	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
China	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✗	✗
Colombia	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

### Surveillance by country, as reported (cont'd)

Country	Cholera	CRS	Diphtheria	Hepatitis A	Hepatitis B	Japanese encephalitis	Measles	Mumps	Neonatal tetanus	Non-neonatal tetanus	Pertussis	Rotavirus	Rubella	Typhoid	Varicella	Yellow fever
Comoros (the)	✓	✗	✗	✗	✗	✗	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓
Congo	✓	✗	✓	✗	✓	✗	✓	✗	✓	✓	✓	✓	✓	✗	✗	✓
Cook Islands		✗														
Costa Rica	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Côte d'Ivoire	✓	✗	✗	✗	✗	✗	✓	✗	✓	✓	✗	✓	✓	✗	✗	✓
Croatia	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cuba	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cyprus		✓					✓					✓				
Czech Republic (the)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Democratic People's Republic of Korea (the)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗
Democratic Republic of the Congo (the)	✓	✓	✓	✗	✗	✗	✓	✗	✓	✗	✓	✓	✓	✓	✗	✓
Denmark	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✓	✓	✗	✗
Djibouti																
Dominica	✓	✓	✓	✗	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Dominican Republic (the)																
Ecuador	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Egypt	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓
El Salvador																
Equatorial Guinea																
Eritrea	✓	✗	✗	✓	✗	✗	✓	✗	✓	✗	✗	✓	✓	✗	✗	✓
Estonia	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ethiopia	✓	✗	✗	✗	✗	✗	✓	✗	✓	✗	✗	✓	✓	✓	✗	✓
Fiji																
Finland		✓					✓					✓				
France		✓					✓					✓				
Gabon	✓	✗	✗	✗	✗	✗	✓	✗	✓	✗	✗	✗	✓	✓	✗	✓
Gambia (the)	✓	✗	✓	✗	✗	✗	✓	✗	✓	✗	✓	✓	✓	✗	✗	✓
Georgia		✓					✓					✓				
Germany		✓					✓					✓				
Ghana	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓
Greece		✓					✓					✓				
Grenada	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Guatemala	✓	✓	✓	✓	✗	✗	✓	✗	✓	✗	✓	✓	✓	✓	✗	✗
Guinea																
Guinea-Bissau																
Guyana	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Haiti	✓	✓	✓	✗	✗	✗	✓	✗	✓	✓	✓	✓	✓	✓	✗	✗



### Surveillance by country, as reported (cont'd)

Country	Cholera	CRS	Diphtheria	Haemophilus influenzae	Hepatitis A	Hepatitis B	Japanese encephalitis	Measles	Mumps	Neonatal tetanus	Non-neonatal tetanus	Pertussis	Rotavirus	Rubella	Typhoid	Varicella	Yellow fever
Honduras	✓	✓	✓	✓	✗	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓
Hungary		✓						✓						✓			
Iceland	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✗	✓
India	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Indonesia	✓	✓	✓	✗	✓	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓	✗	✗
Iran (Islamic Republic of)	✓	✓	✓	✓	✗	✓	✗	✓	✗	✓	✓	✓	✗	✓	✓	✗	✗
Iraq																	
Ireland		✓						✓						✓			
Israel		✓						✓						✓			
Italy		✓						✓						✓			
Jamaica	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Japan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Jordan	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Kazakhstan		✓						✓						✓			
Kenya	✓	✓	✓	✓	✗	✗	✗	✓	✗	✓	✗	✗	✓	✓	✓	✗	✓
Kiribati		✗															
Kuwait	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✓	✓	✗	✗
Kyrgyzstan		✓						✓						✓			
Lao People's Democratic Republic (the)	✓	✗	✓	✗	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✗	✗
Latvia		✓						✓						✓			
Lebanon	✓	✓	✓	✗	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗
Lesotho	✗	✗	✗	✓	✗	✗	✗	✓	✗	✓	✗	✗	✓	✓	✗	✗	✗
Liberia	✗	✗	✗	✗	✗	✗	✗	✓	✗	✓	✗	✓	✓	✓	✗	✗	✓
Libya																	
Lithuania	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Luxembourg	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓
Madagascar	✓	✗	✓	✓	✗	✗	✗	✓	✗	✓	✗	✗	✓	✓	✓	✗	✗
Malawi	✓	✗	✗	✓	✗	✗	✗	✓	✗	✓	✗	✗	✓	✓	✗	✗	✗
Malaysia	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Maldives	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓
Mali	✓	✗	✓	✓	✗	✗	✗	✓	✗	✗	✗	✗	✓	✓	✗	✗	✓
Malta	✗	✓	✗	✓	✓	✓	✗	✓	✓	✗	✓	✓	✗	✓	✗	✗	✓
Marshall Islands (the)	✗	✓	✗	✗	✓	✗	✗	✓	✓	✗	✗	✗	✓	✓	✗	✗	✗
Mauritania	✓	✗	✗	✓	✓	✓	✗	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓
Mauritius	✗	✗	✓	✓	✓	✓	✗	✓	✗	✓	✓	✓	✓	✓	✓	✗	✗
Mexico	✓	✓	✓	✗	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Micronesia (Federated States of)	✓	✓	✓	✗	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓

### Surveillance by country, as reported (cont'd)

Country	Cholera	CRS	Diphtheria	Hepatitis A	Hepatitis B	Japanese encephalitis	Measles	Mumps	Neonatal tetanus	Non-neonatal tetanus	Pertussis	Rotavirus	Rubella	Typhoid	Varicella	Yellow fever
Monaco																
Mongolia	X	X	✓	✓	✓	X	✓	✓	X	X	✓	✓	✓	X	X	X
Montenegro	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Morocco																
Mozambique																
Myanmar	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	X	X
Namibia	✓	X	✓	✓	✓	X	✓	X	✓	✓	✓	✓	✓	✓	X	✓
Nauru																
Nepal	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	X	X	X
Netherlands (the)	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	X	✓
New Zealand	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓
Nicaragua	✓	✓	✓	✓	✓	X	✓	X	✓	✓	✓	✓	✓	X	X	X
Niger (the)																
Nigeria	✓	X	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Niue																
Norway		✓					✓						✓			
Oman																
Pakistan																
Palau	✓	X	X	✓	✓	X	✓	✓	X	X	✓	X	✓	✓	✓	X
Panama																
Papua New Guinea		✓														
Paraguay	X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	X	✓	✓
Peru																
Philippines (the)	✓	X	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	X	X
Poland		✓					✓						✓			
Portugal		✓					✓						✓			
Qatar																
Republic of Korea (the)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Republic of Moldova (the)		✓					✓						✓			
Romania	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓
Russian Federation (the)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rwanda	X	✓	X	X	X	X	✓	X	✓	X	X	X	✓	X	X	X
Saint Kitts and Nevis	X	X	X	✓	✓	X	✓	X	X	X	X	✓	✓	X	X	✓
Saint Lucia	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Saint Vincent and the Grenadines	X	✓	✓	X	✓	X	✓	✓	✓	✓	✓	✓	✓	X	X	✓
Samoa																
San Marino	X	✓	X	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	X	✓	X

### Surveillance by country, as reported (cont'd)

Country	Cholera	CRS	Diphtheria	Hepatitis A	Hepatitis B	Japanese encephalitis	Measles	Mumps	Neonatal tetanus	Non-neonatal tetanus	Pertussis	Rotavirus	Rubella	Typhoid	Varicella	Yellow fever
Sao Tome and Principe	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Saudi Arabia	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Senegal	✓	✓	✗	✗	✗	✗	✓	✗	✓	✗	✗	✓	✓	✗	✗	✓
Serbia	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓
Seychelles	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sierra Leone	✓	✗	✗	✓	✓	✗	✓	✓	✓	✗	✗	✗	✓	✓	✗	✓
Singapore																
Slovakia	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Slovenia		✓					✓						✓			
Soloman Islands	✗	✗	✗	✗	✗	✗	✓	✗	✓	✗	✗	✗	✓	✗	✗	✗
Somalia	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✗	✓
South Africa	✓	✓	✓	✓	✗	✓	✓	✗	✓	✗	✓	✓	✓	✓	✗	✓
South Sudan																
Spain	✗	✓	✓	✗	✗	✗	✓	✓	✓	✓	✓	✗	✓	✗	✓	✗
Sri Lanka	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sudan (the)																
Suriname	✓	✓	✓	✗	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Swaziland	✗	✓	✗	✗	✗	✗	✓	✗	✓	✗	✗	✓	✓	✗	✗	✗
Sweden	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✗	✓
Switzerland	✗	✓	✗	✓	✓	✗	✓	✓	✗	✗	✓	✗	✓	✗	✗	✓
Syrian Arab Republic (the)	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗
Tajikistan		✓					✓						✓			
Thailand	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗
The former Yugoslav Republic of Macedonia	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Timor-Leste	✗	✓	✓	✗	✗	✓	✓	✗	✓	✓	✓	✓	✓	✗	✗	✓
Togo	✓	✓	✓	✗	✗	✗	✓	✗	✓	✗	✓	✓	✓	✓	✗	✓
Tonga		✗														
Trinidad and Tobago	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Tunisia	✓	✗	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓
Turkey		✓					✓						✓			
Turkmenistan		✓					✓						✓			
Tuvalu																
Uganda	✓	✓	✗	✗	✓	✗	✓	✗	✓	✓	✗	✓	✓	✓	✗	✓
Ukraine		✓					✓						✓			
United Arab Emirates (the)																
United Kingdom of Great Britain and Northern Ireland (the)		✓					✓						✓			
United Republic of Tanzania	✓	✓	✗	✗	✓	✗	✓	✗	✓	✓	✗	✓	✓	✓	✗	✓

### Surveillance by country, as reported (cont'd)

Country	Cholera	CRS	Diphtheria	Hepatitis A	Hepatitis B	Japanese encephalitis	Measles	Mumps	Neonatal tetanus	Non-neonatal tetanus	Pertussis	Rotavirus	Rubella	Typhoid	Varicella	Yellow fever
United States of America (the)	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Uruguay	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓
Uzbekistan		✓				✓							✓			
Vanuatu		✗														
Venezuela (Bolivarian Republic of)	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Viet Nam	✗	✓	✓	✗	✗	✓	✓	✗	✓	✓	✓	✓	✓	✗	✗	✗
Yemen																
Zambia	✓	✓	✓	✗	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Zimbabwe	✓	✓	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓