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Eidgenössisches Departement des Innern EDI
Bundesamt für Gesundheit BAG

Management of healthcare-associated outbreaks

First National recommendations

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SWISSnosc Nationales Zentrum für Infektionsprävention

Schweizerische Gesellschaft für Infektiologie
Swiss Society for Infectious Diseases
Société Suisse d'Infektiologie

SGM-SSM

Strategie Antibiotikaresistenzen
StAR

Symposium Antibiotic resistance, 22 November 2019

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Guidelines prepared by the working group within the StAR subproject: "Prevention & control of MDRO"

- 1. Management of health-care associated outbreaks**
- 2. Prevention and control of multidrug resistant organisms (MDRO) in the non-outbreak setting**
- 3. Additional measures for prevention and control of health-care associated outbreaks with MDRO**

Goal:

- Elaboration of evidence-based National recommendations for local healthcare providers and other stakeholders
 - to investigate and manage outbreaks associated with health-care associated infections and epidemiologically relevant pathogens
 - For the prevention and control of MDRO in the outbreak and non-outbreak setting

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HOW OUTBREAKS CAN CONTRIBUTE TO PREVENTION OF NOSOCOMIAL INFECTION: ANALYSIS OF 1,022 OUTBREAKS

Most frequent types of infection

- ✓ 37% Bloodstream
- ✓ 28% Gastrointestinal
- ✓ 23% Pneumonia
- ✓ 14% UTI
- ✓ 12% SSI

Gastmeier P. et al. Infect Control Hosp Epidemiol 2005;26:357-361

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HOW OUTBREAKS CAN CONTRIBUTE TO PREVENTION OF NOSOCOMIAL INFECTION: ANALYSIS OF 1,022 OUTBREAKS

Most frequent types of infection

Most frequent types of sources

- | | |
|------------------------|------------------------------------|
| ✓ 37% Bloodstream | ✓ 37% no source identified |
| ✓ 28% Gastrointestinal | ✓ 26% patients |
| ✓ 23% Pneumonia | ✓ 12% medical equipment or devices |
| ✓ 14% UTI | ✓ 12% environment |
| ✓ 12% SSI | ✓ 11% staff |
| | ✓ 4% contaminated drugs |

Gastmeier P. et al. Infect Control Hosp Epidemiol 2005;26:357-361

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HOW OUTBREAKS CAN CONTRIBUTE TO PREVENTION OF NOSOCOMIAL INFECTION: ANALYSIS OF 1,022 OUTBREAKS

Most frequent types of infection	Most frequent types of sources	Mode of transmission
✓ 37% Bloodstream	✓ 37% no source identified	✓ 28% unclear
✓ 28% Gastrointestinal	✓ 26% patients	✓ 45% by contact
✓ 23% Pneumonia	✓ 12% medical equipment or devices	✓ 16% through invasive techniques
✓ 14% UTI	✓ 12% environment	✓ 15% through the air
✓ 12% SSI	✓ 11% staff	
	✓ 4% contaminated drugs	

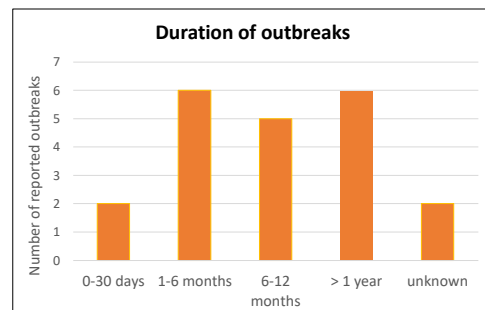
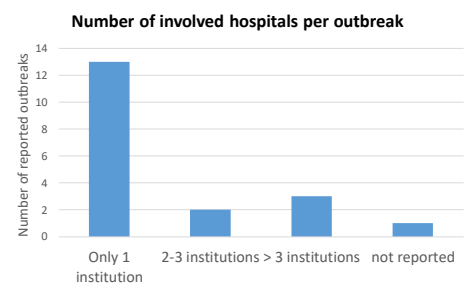
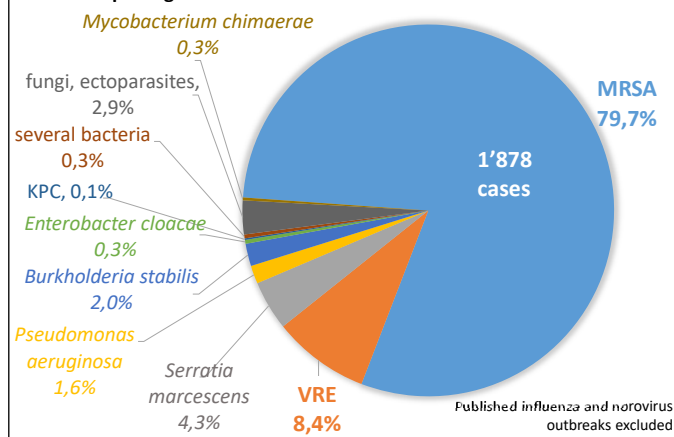
Gastmeier P. et al. Infect Control Hosp Epidemiol 2005;26:357-361

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Review of published nosocomial outbreaks in Switzerland (1996 – 2018) n= 19 outbreaks, 2355 cases

Identified pathogens and affected cases



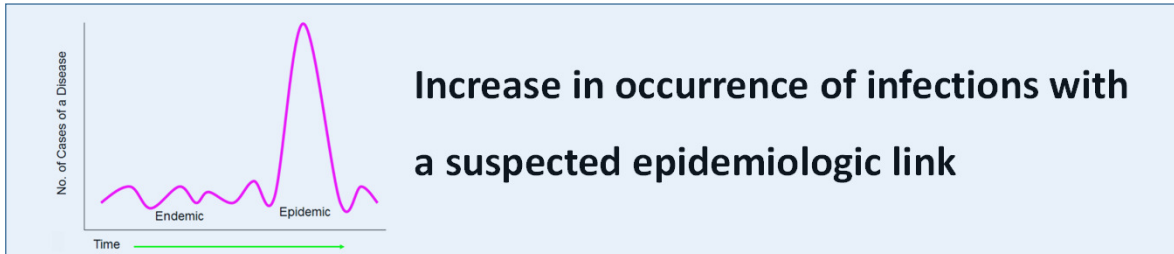
Vuichard-Gysin D. et al. unpublished

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Definition of a healthcare-associated outbreak



Examples:

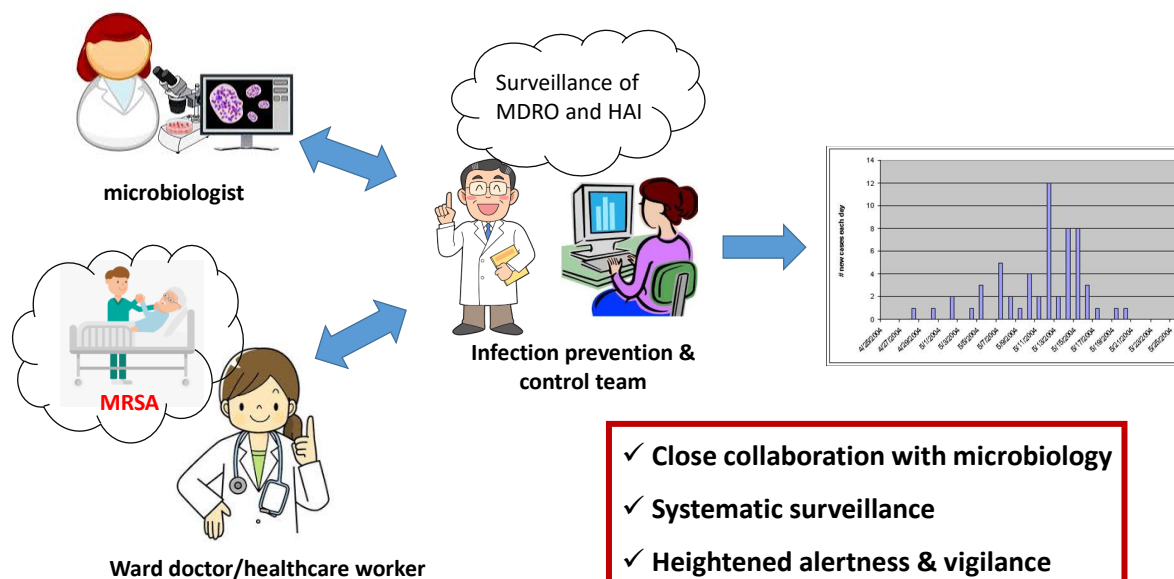
- Two or more healthcare associated infections (HAI) with the same pathogen in temporal/local context
- Accumulation of infections in a specific population or department, or at an unusual anatomical site
- Detection of a multidrug-resistant organism (MDRO) in a single hospitalized non-isolated patient may be the first sign of an outbreak!

Robert Koch-Institut (Hrsg.). Handbuch zum Modul VI Fortbildung „Krankenhaushygiene“. Berlin 2015
Lauer A et al. Chapter 11. Outbreak Investigation, in Practical Healthcare Epidemiology, 4th edition. Cambridge University Press. 2018

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Detection of healthcare-associated outbreaks



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Management of a healthcare-associated outbreak



1. Verify the diagnosis and the presence of an outbreak
 - Carefully evaluate clinical information and laboratory reports
 - Perform site visits



2. Ask the laboratory to save the strains
 - Patients, suspect instruments, other sources potentially associated with the outbreak
 - Isolates can be investigated later using molecular methods (if necessary)



3. Implement first control measures
 - As targeted and as quickly as possible in order to prevent patients and staff from harm



4. Search for information



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Management of a healthcare-associated outbreak (cont.)



5. Report the outbreak

- Report to hospital administrators
- Report to your cantonal physician (mandatory notification)



Epidemics Act:

- Report frequent clinical or laboratory analytical findings that exceed the expected extent for a certain period or location to the cantonal physician within the statutory period



6. Proceed with a systematic approach

- Define and identify cases
- Develop a line list (find out what do cases have in common?)
- Perform descriptive studies
- Design an epidemic curve

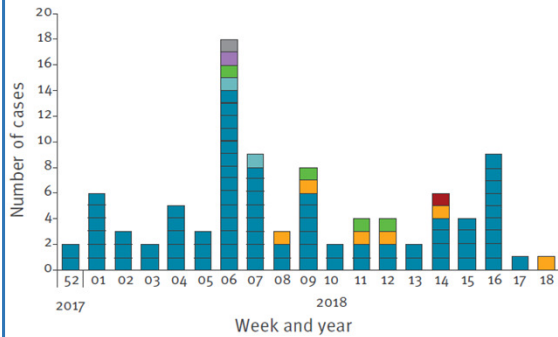
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Information from epidemic curves

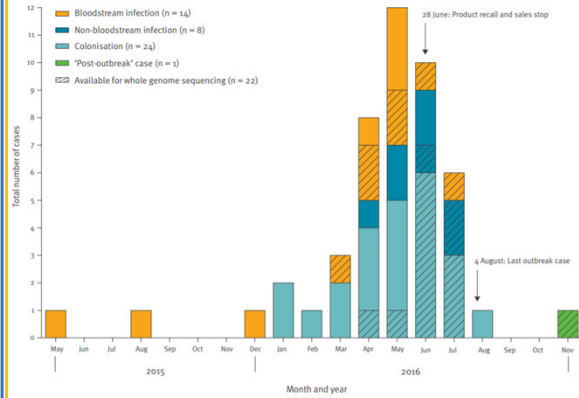
Propagated outbreak:



Vancomycin-resistant enterococci cases by sequence type, Bern outbreak Dec 2017 – Apr 2018

Wassilew N. et al. Euro Surv 2018

Point source outbreak:



Cases of *Burkholderia cepacia* complex associated with contaminated Sinaqua Dermal Gloves, Switzerland

Sommerstein R. et al. Euro Surv 2017

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7. Implement targeted control and prevention measures

Adapt, modify or expand initiated measures according to:



• Mode of transmission



• Causing agent



• Source



• Patients

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Examples for targeted control and prevention measures



• Transmission via contact

- ✓ Reinforce hand hygiene adherence
- ✓ Observe/enhance environmental decontamination
- ✓ Isolate patients, cohort contact patients as appropriate
- ✓ Initiate screening
- ✓ Consider ward closure
- ✓ Decolonization of colonized patients if possible



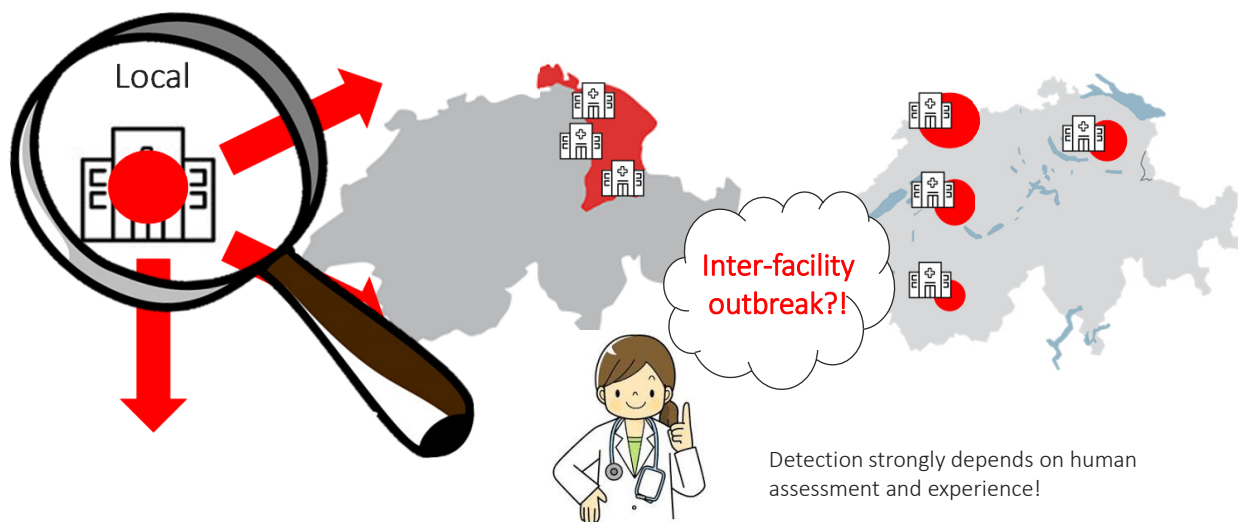
• Suspected contaminated devices

- ✓ Remove device from use, save suspected lot numbers
- ✓ Consider culturing
- ✓ Check reprocessing of devices
- ✓ Report to manufacturer/Swissmedic

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Sometimes the outbreak cannot be contained at the local level



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Know the risk factors for interfacility spread

Common reasons for interfacility outbreaks:

- ✓ Frequent patient movements between healthcare facilities
- ✓ Low pathogenicity of the causing pathogen facilitating unrecognized transmission events
- ✓ Suboptimal adherence to local infection control policies
- ✓ Suboptimal environmental control
- ✓ Lack of active surveillance
- ✓ Insufficient communication

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Perez F. JAC 2010; Wassilew N. Euro Surv 2018; Buser et al. ICHE 2017; Harbarth et al. Lancet Infect Dis 2001

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Importance of communication

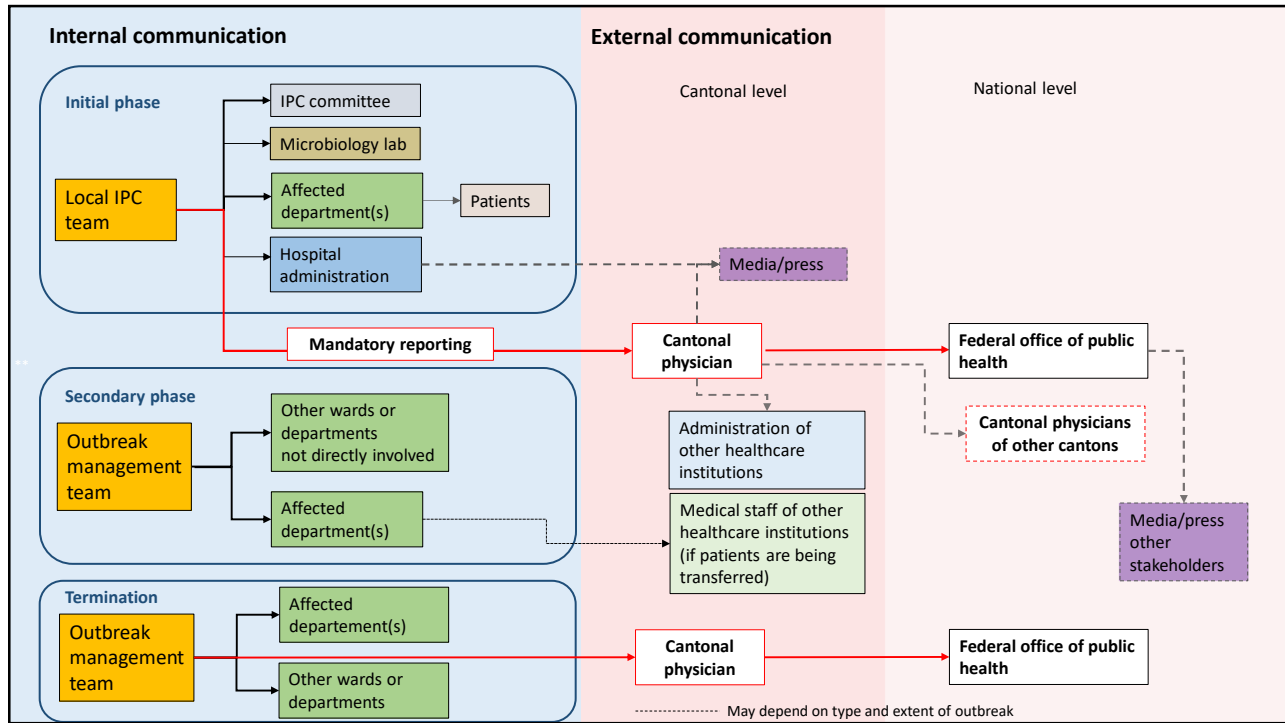
- Communication during outbreaks is often a major challenge
- Every hospital should have a communication standard in place for internal and external communication
 - **Outbreak management team:** usually responsible for **internal communication** and for **reporting to the cantonal physician**
 - **Experienced spokesman from hospital management** should be defined for **external communication**, e.g. with media/press
 - **Communication with other hospitals is critical** if colonized or infected patients are the source of transmission

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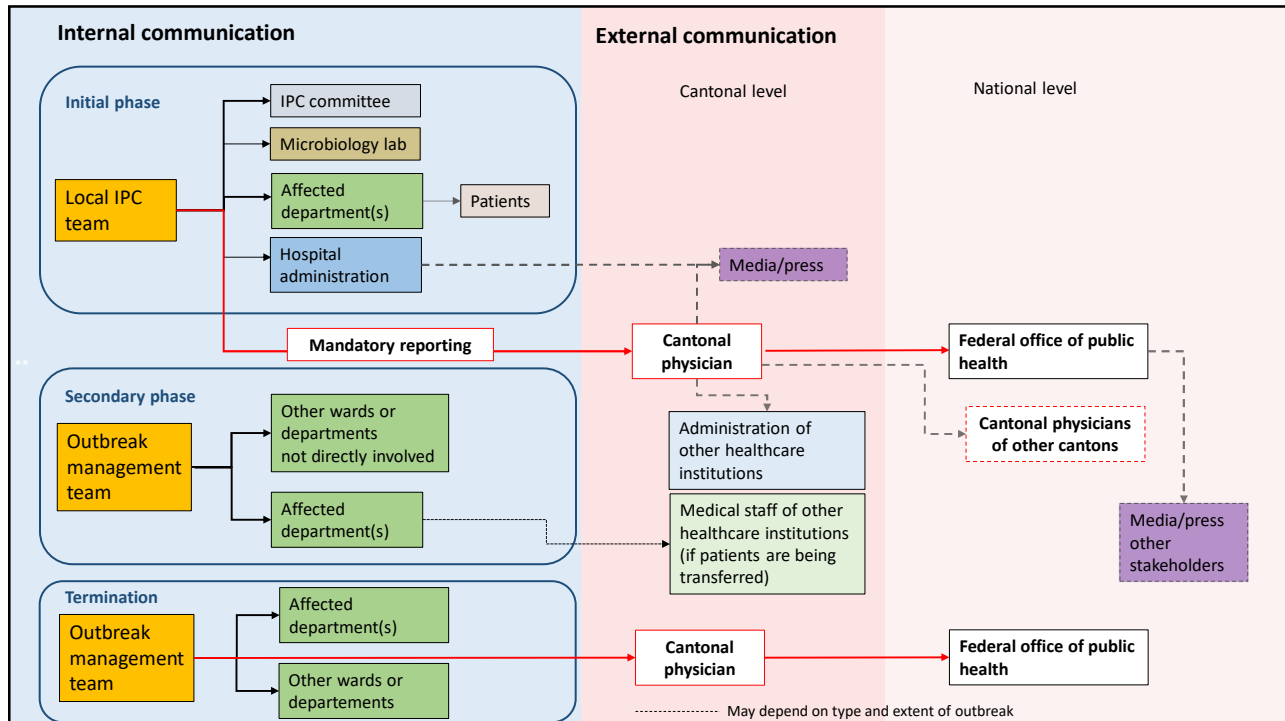
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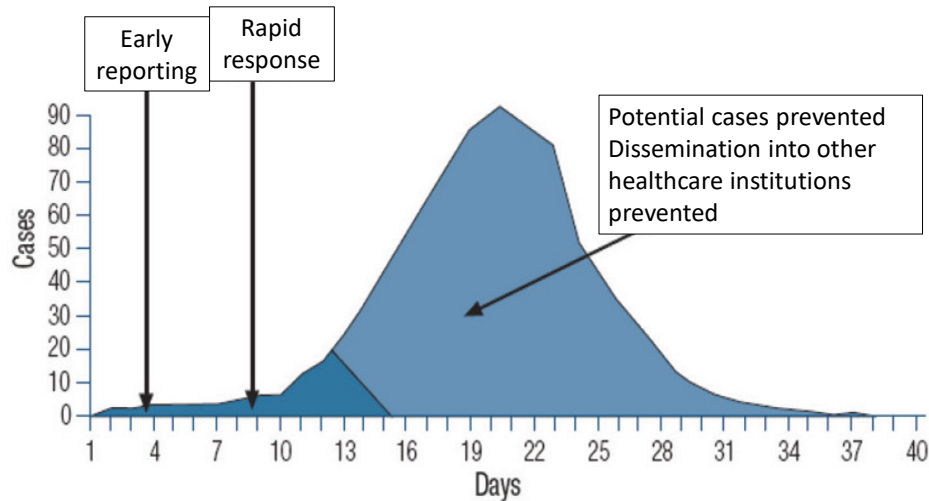


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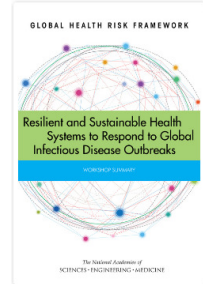


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Early reporting and rapid response are key elements of outbreak containment.



Source: Global Health Risk Framework. Download at <https://www.ncbi.nlm.nih.gov/books/NBK367950/> (last accessed Sept 06, 2019).



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Summary core actions for outbreak management

- Have a consistent surveillance
- Be alert
- Adhere to infection control policies
- Take immediate control measures
- Communicate & report

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