University of Sheffield

COMMUNICABLE DISEASE EPIDEMIOLOGY & SURVEILLANCE

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March 2023

A WORLD TOP 100 UNIVERSITY

Session objectives

By the end of the session, you should

1. Understand basic epidemiological terms used in communicable disease control
2. Be able to describe the different types of surveillance
3. Be aware of the purpose and limitations of the different types of surveillance
4. Understand the role of surveillance in disease control

Concepts & Terminology

Communicable Diseases & Epidemiology

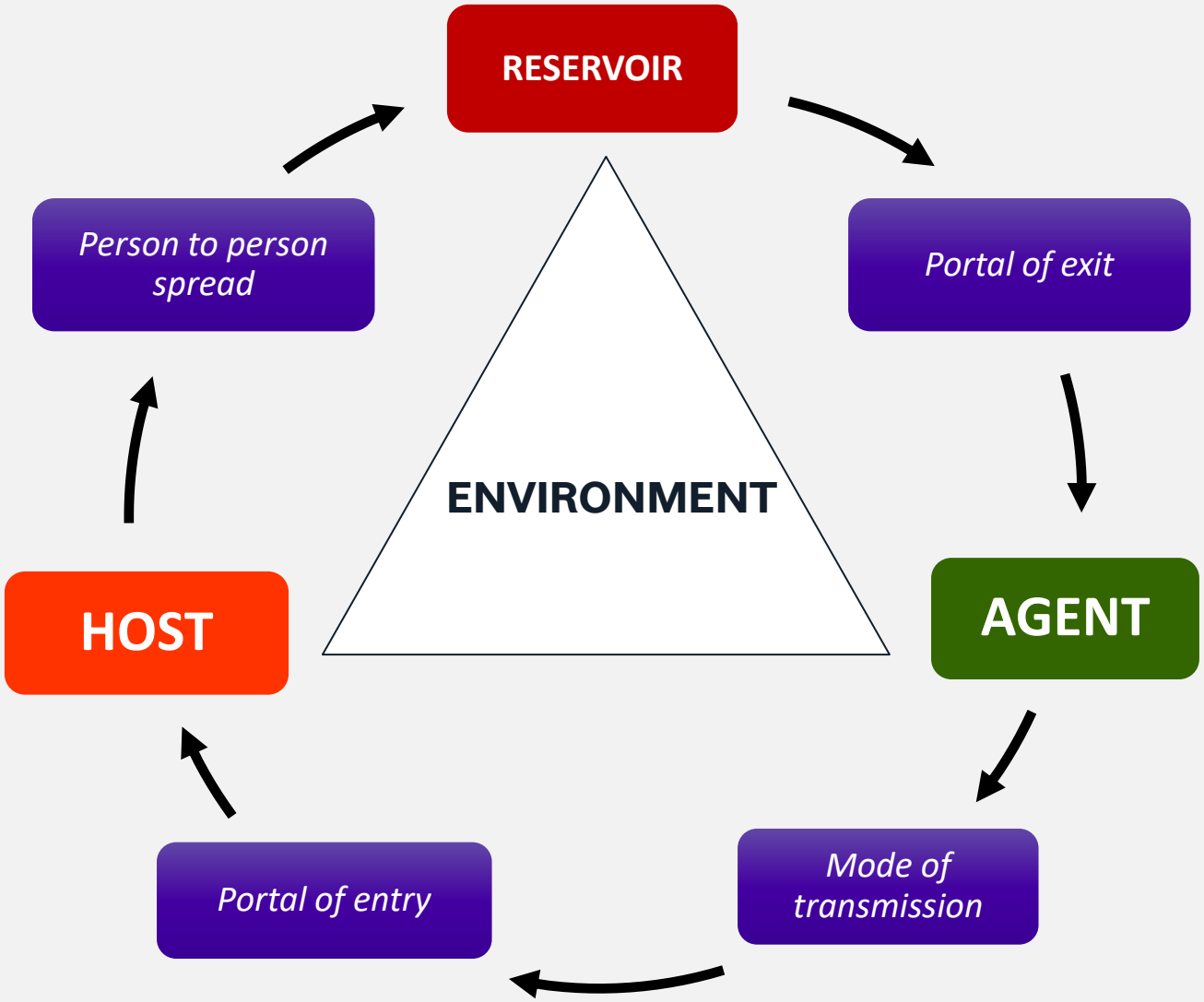
Diseases do not occur at random– there are causal factors!

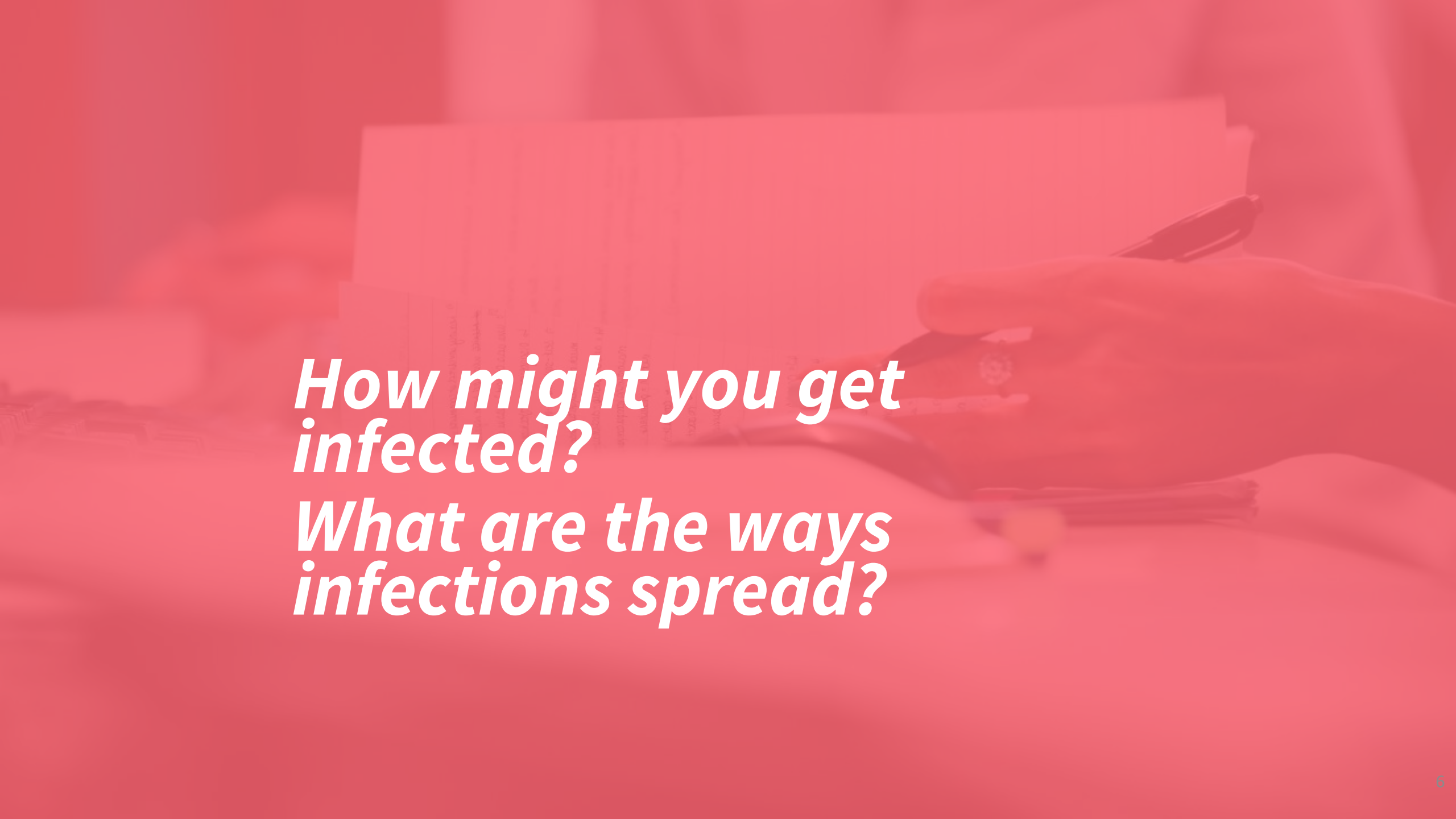
Purpose of epidemiology is to identify these factors

Diseases are often described in terms of

- Frequency
- Distribution (time, place, person)
- Determinants

Chain of infection

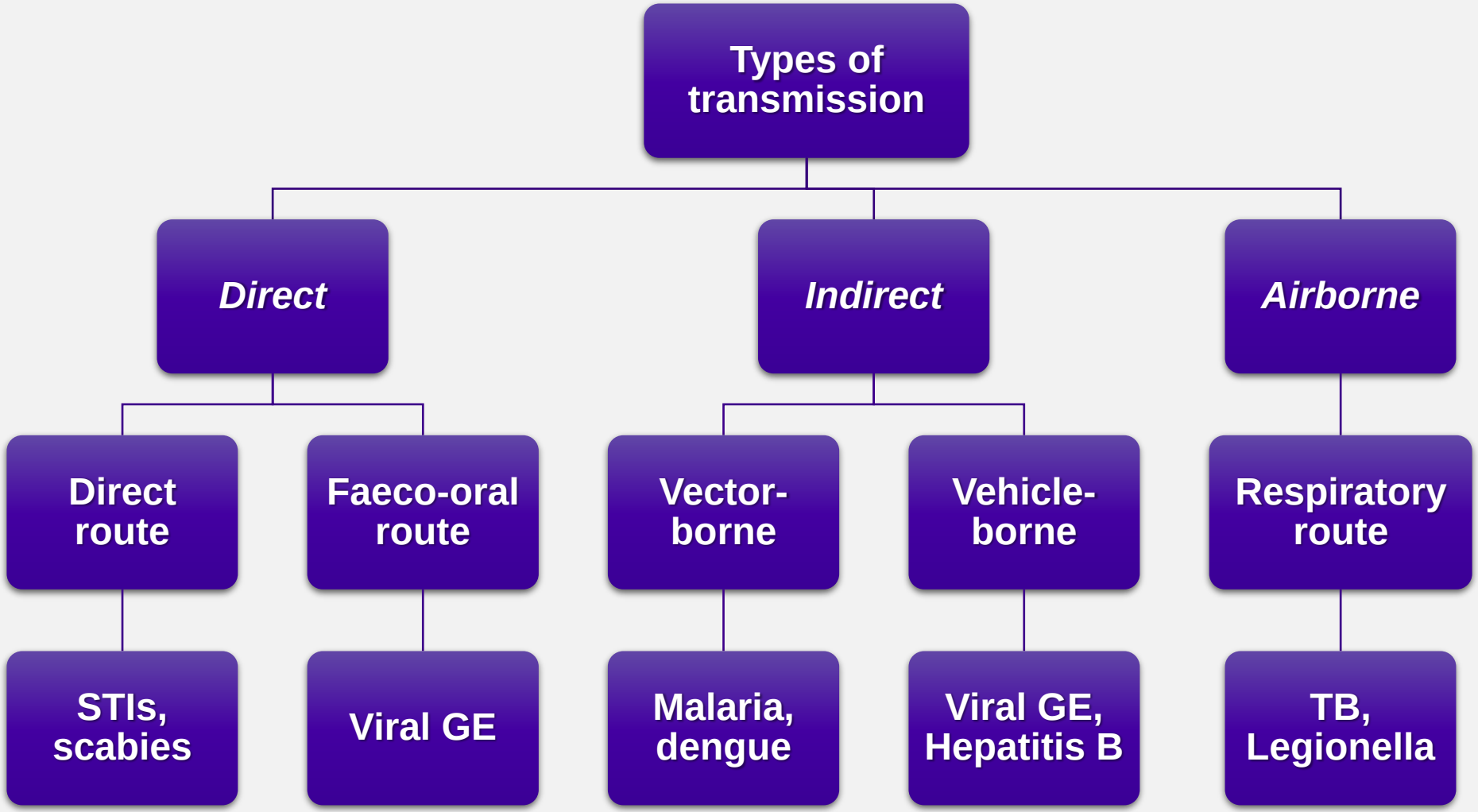




How might you get infected?

What are the ways infections spread?

Types of transmission



Terminology

Endemic – persistent level of disease occurrence

Hyper-endemic – persistently high levels of disease occurrence

Sporadic – Irregular pattern of occurrence

Epidemic – Occurrence within an area in excess of what is expected for a given time period

Pandemic – Epidemic widespread over several countries

Terminology

Outbreak

- 2 or more cases of a disease that are linked; OR
- Occurrence of a disease not expected in the area e.g. Ebola in the UK

Common source outbreak

- When a group of persons have been exposed to a common source of an infectious agent or toxin
- e.g. ate at the same restaurant, shopped from the same grocery shop, attended the same class, etc…

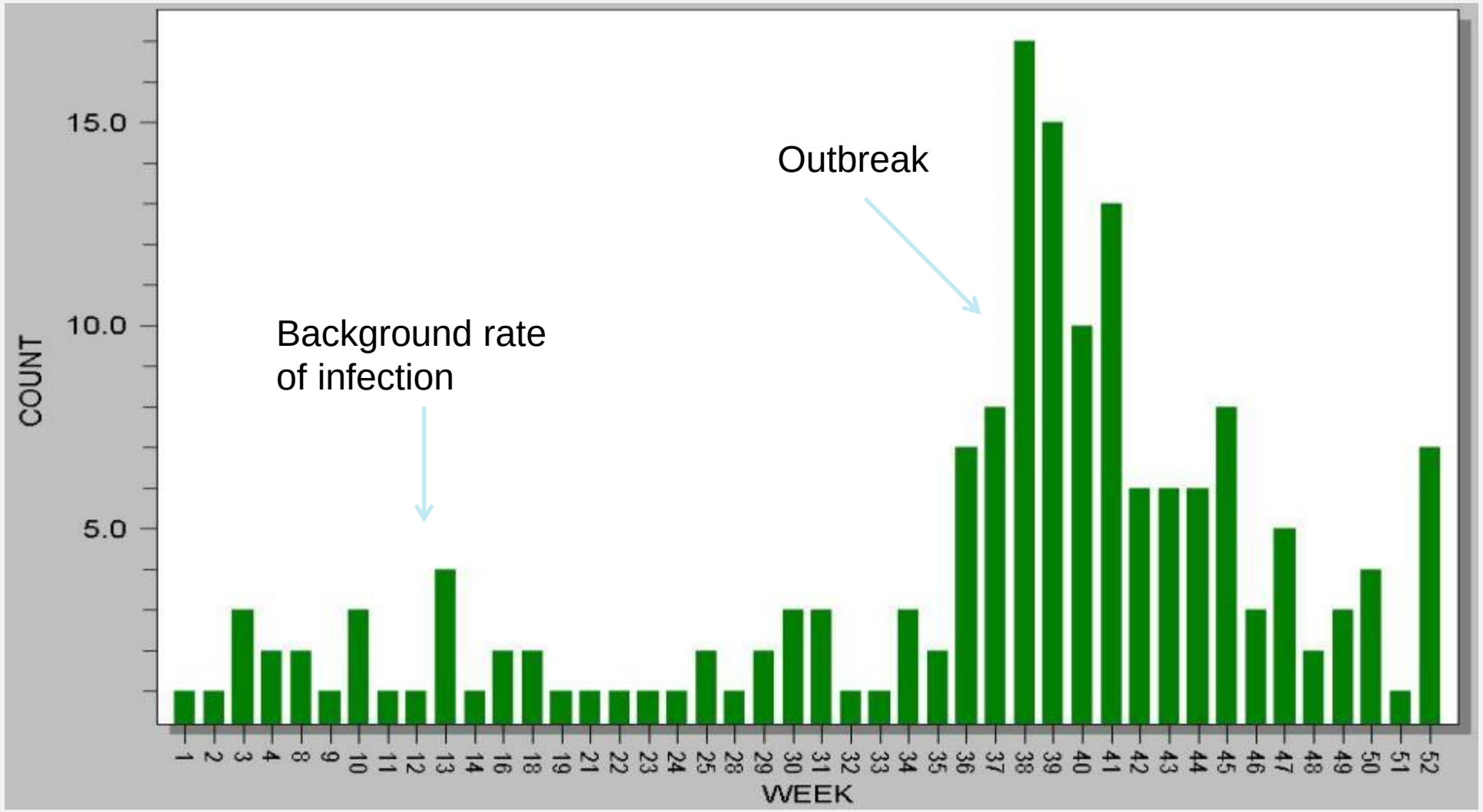
Point source outbreak

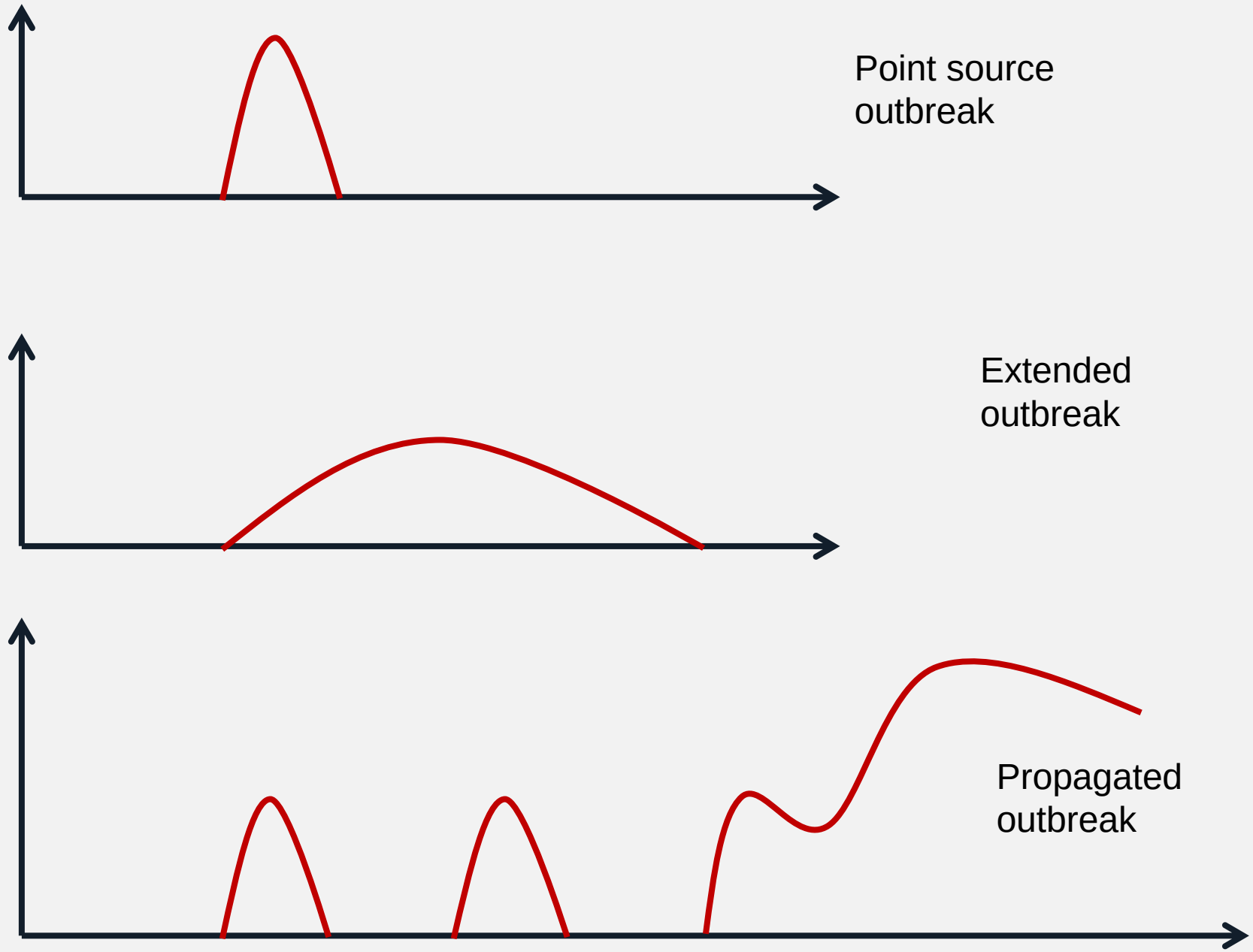
- When the exposure to an infectious agent or toxin has occurred over a brief period of time

Propagated outbreak

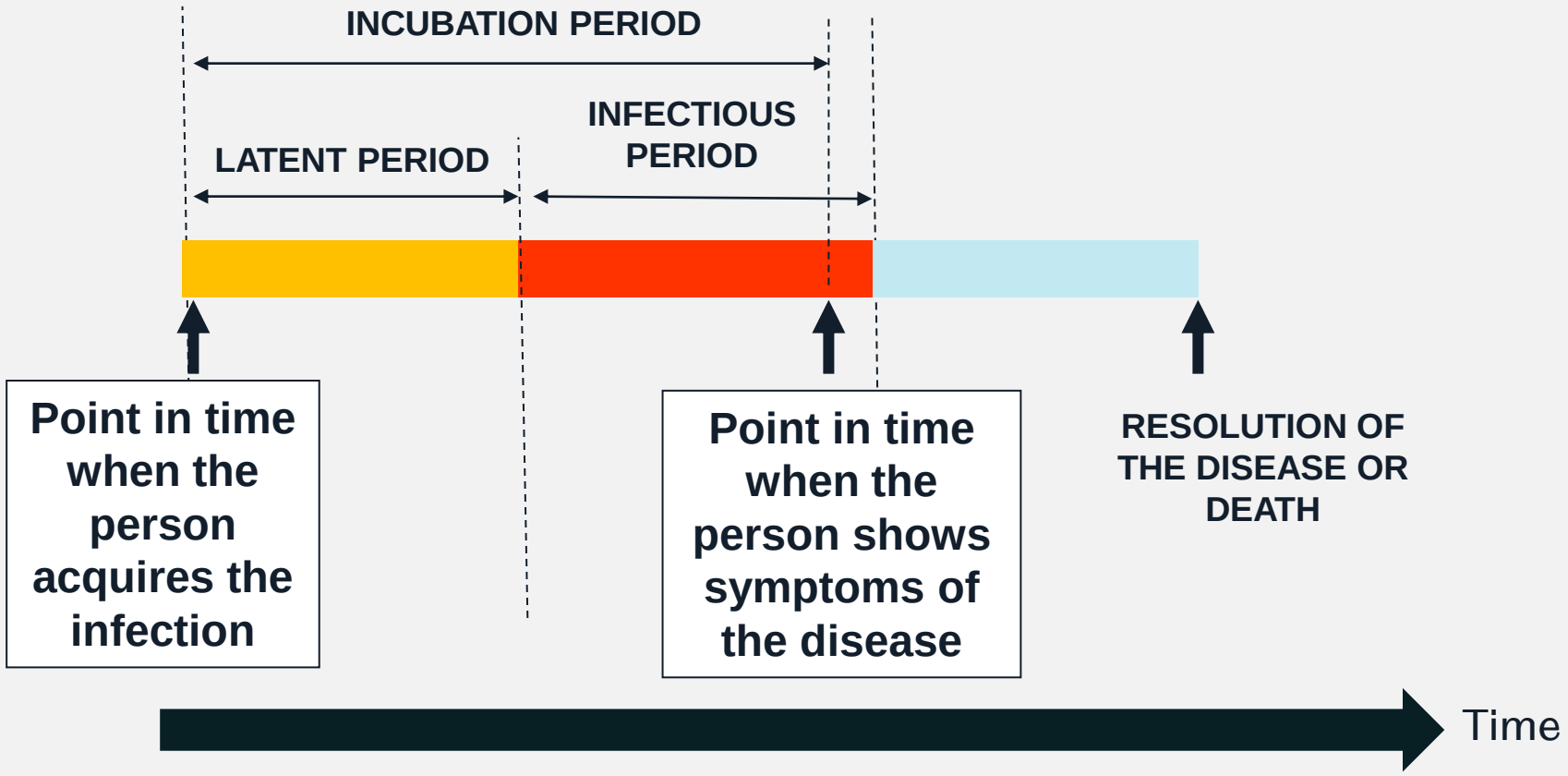
- When an outbreak is gradually spreading from person to person

Example

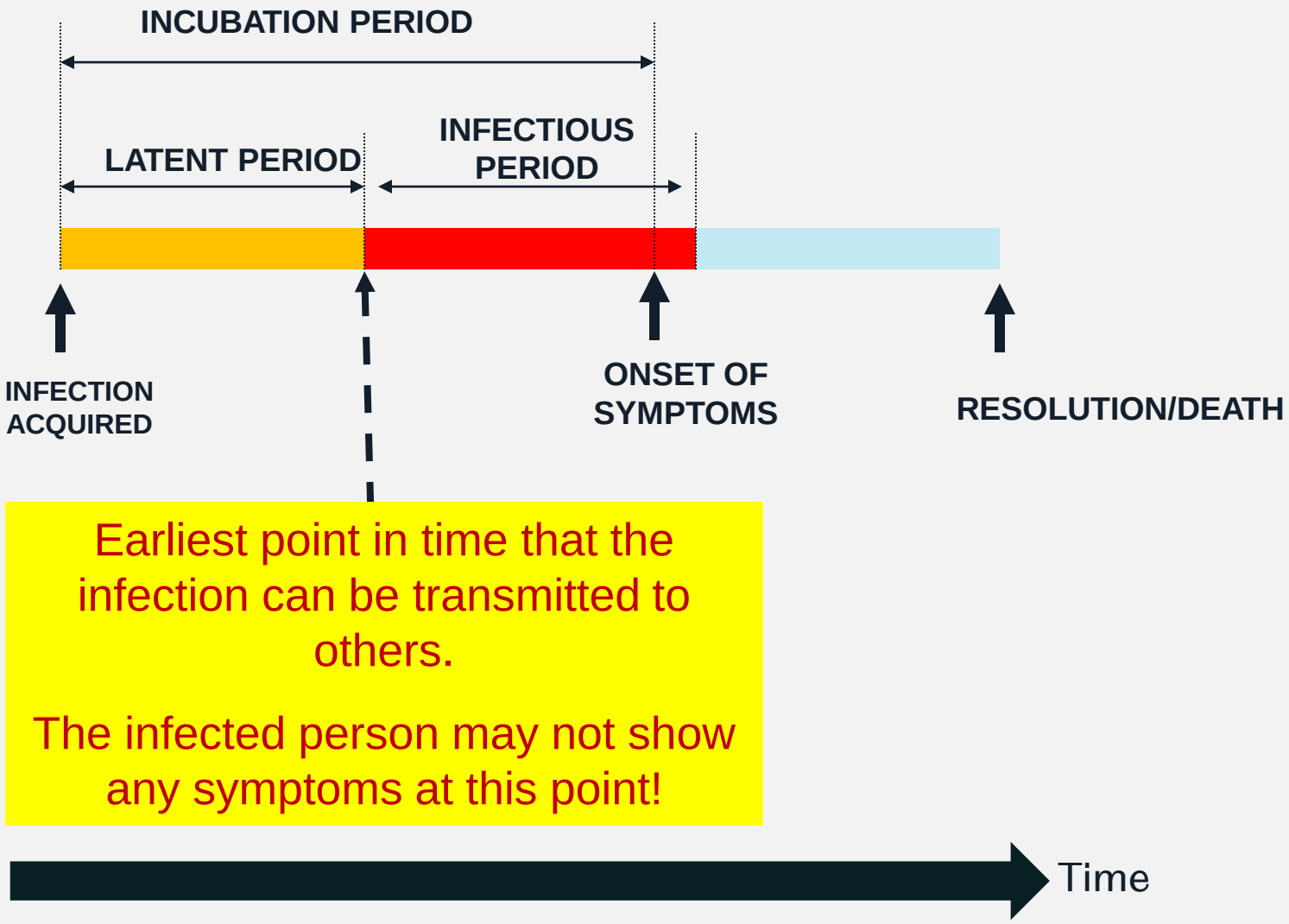

Outbreak
Background rate
of infection
COUNT
15.0
10.0
5.0
WEEK
1 2 3 4 8 9 10 11 12 13 14 16 18 19 21 22 23 24 25 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52


Point source
outbreak
Extended
outbreak
Propagated
outbreak

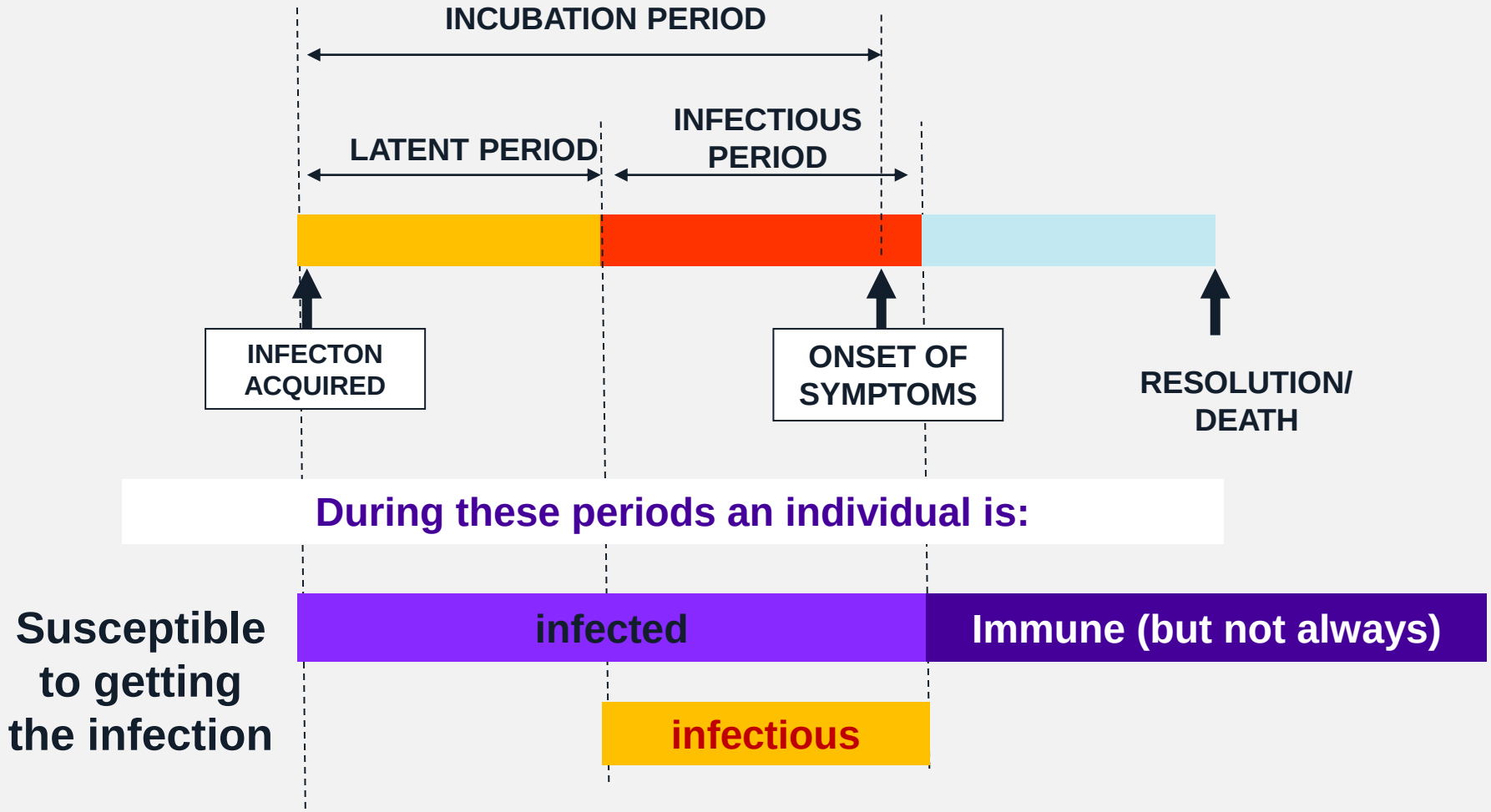
Natural history of an infectious disease

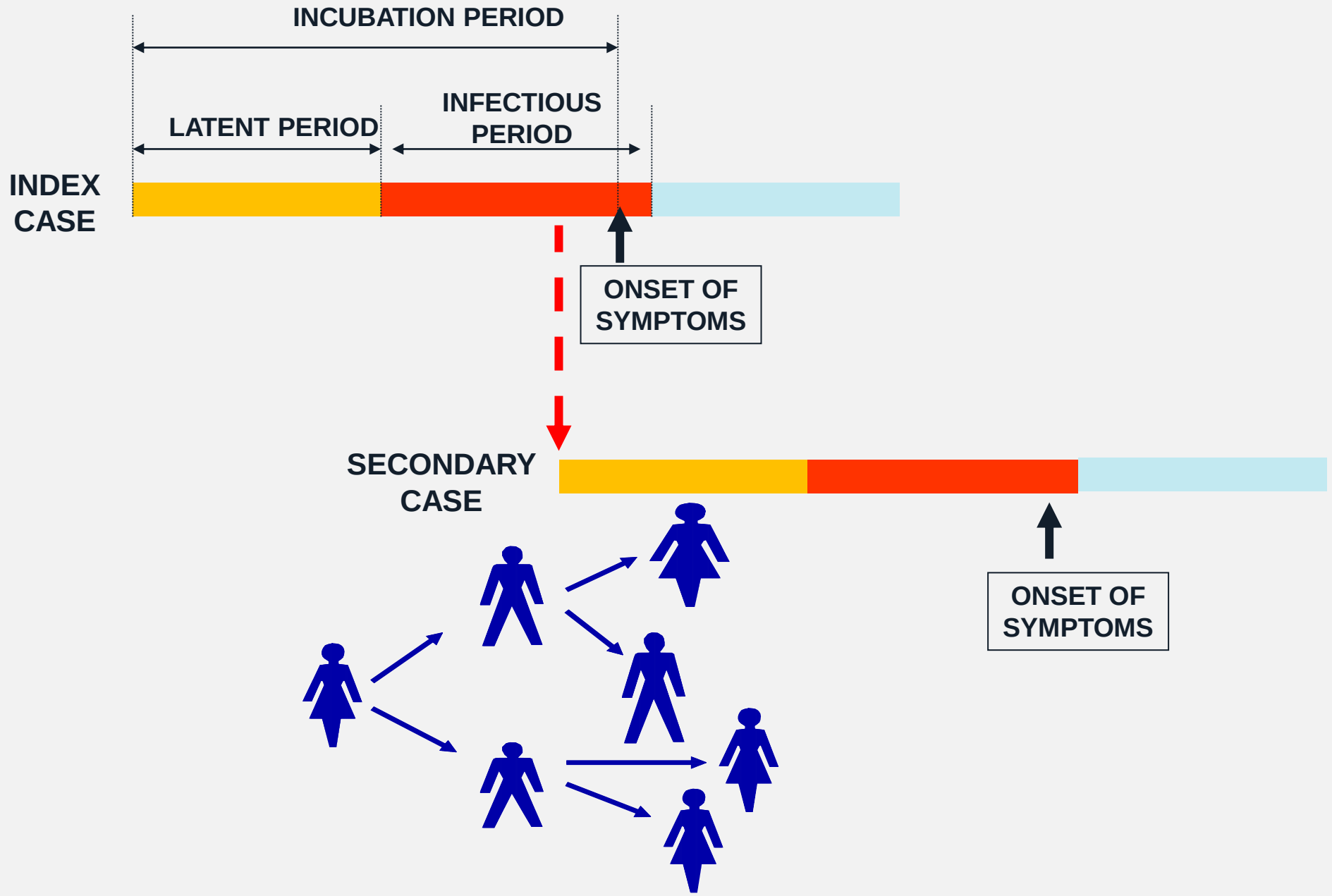


Natural history of an infectious disease



Natural history of an infectious disease




INCUBATION PERIOD
LATENT PERIOD
INFECTIOUS PERIOD
INDEX CASE
ONSET OF SYMPTOMS
SECONDARY CASE
ONSET OF SYMPTOMS

Terminology & concepts

Infectious dose

– The quantity of micro-organisms needed to produce infection in the host

Infectivity (a.k.a. ***Attack rate***)

– The proportion of exposed persons who become infected

Pathogenicity

– The proportion of infected persons who develop disease

Virulence

– The proportion of persons who develop disease who become severely ill or die

Disease incidence

Number of **NEW** cases occurring over a given time period in a defined population at risk (disease-free initially)

Cumulative incidence

E.g. 1,500 cases of cholera in a district (population 100,000) over a 1 month period:

Cumulative Incidence = 1.5% (1,500 / 100,000)

Incidence rate

E.g. 200 people followed up for varying periods of time up to 1 year. Total time all have contributed = 100 person-years. 30 cases of influenza in this cohort.

Incidence rate = 30/100 person-years

Disease prevalence

Number of **EXISTING** cases at a given point in time in a defined population at risk

Point prevalence (i.e. point in time)

Period prevalence (i.e. over a period)

- E.g. survey of the number of HIV-positive women from antenatal screening.
- 100 women surveyed over one month, 20 cases detected.
- Therefore point prevalence = 20%

Strength of association – Odds Ratios

Calculated from case-control studies

Odds = number of event A occurring

number of event B occurring

E.g. 20 out of a 100 children in a school contracted a chicken pox infection,

- ***Risk*** (chance) of being infected is 20/100 = 20%
- ***Odds*** of being infected is 20/80 = 25%

The Odds Ratio approximates the relative risk.

For rare events, the odds of a rare event equal the risk of rare event

It gives you an idea of the strength of association. Not necessarily causal!

Scenario: Outbreak of diarrhoea in persons eating at a fast food restaurant. You hypothesize dodgy burgers are to blame. A case control study is carried out as follows:

Worked example	**Diarrhoea** *(outcome)* (CASES)	**No diarrhoea** *(without outcome)* (CONTROLS)
Had burger *(exposure)*	60 *a*	40 *b*
Did not have burger *(no exposure)*	20 *c*	80 *d*

Image source: Microsoft clipart

Scenario: The dodgy burger incident

- *(1)* Odds of having diarrhoea if they had the burger

  $$= \frac{\text{number with diarrhoea who ate burger}}{\text{number with diarrhoea who didn't eat burger}}$$ CASES

  $= 60/20 = 3$

- *(2)* Odds of not having diarrhoea (COPD) if they ate burger

  $$= \frac{\text{number without diarrhoea who ate burger}}{\text{number without diarrhoea who didn't eat burger}}$$ CONTROLS

  $= 40/80 = 0.5$

- **Odds ratio** = *(1)* / *(2)* = 3 / 0.5 = 6

SIR Paradigm

For infections that lead to permanent immunity; individuals are in one of 3 states:

- **S**usceptible to infection
- **I**nfected and infectious
- **R**ecovered and immune

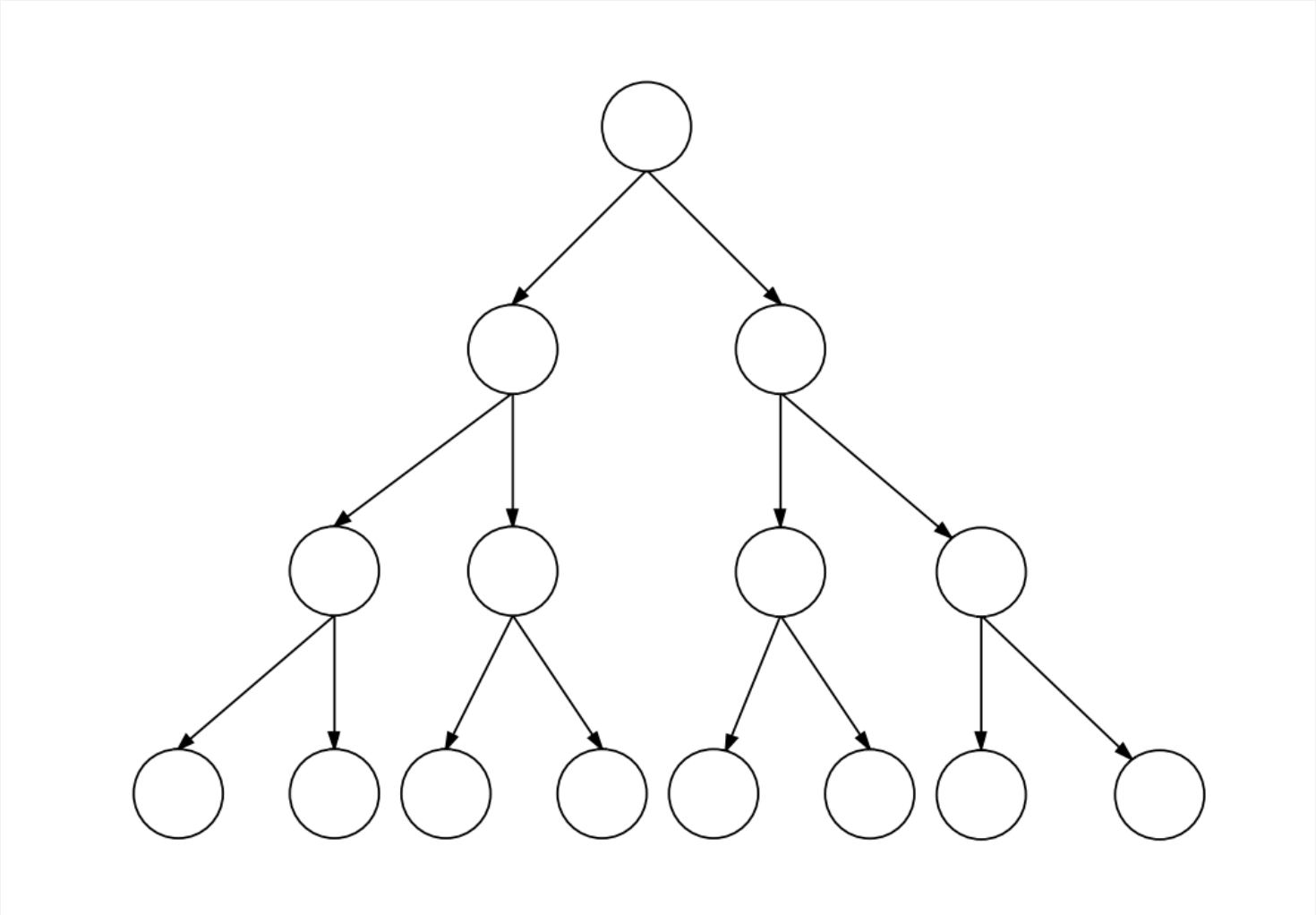
Reproduction ratio, R_0

Definition:

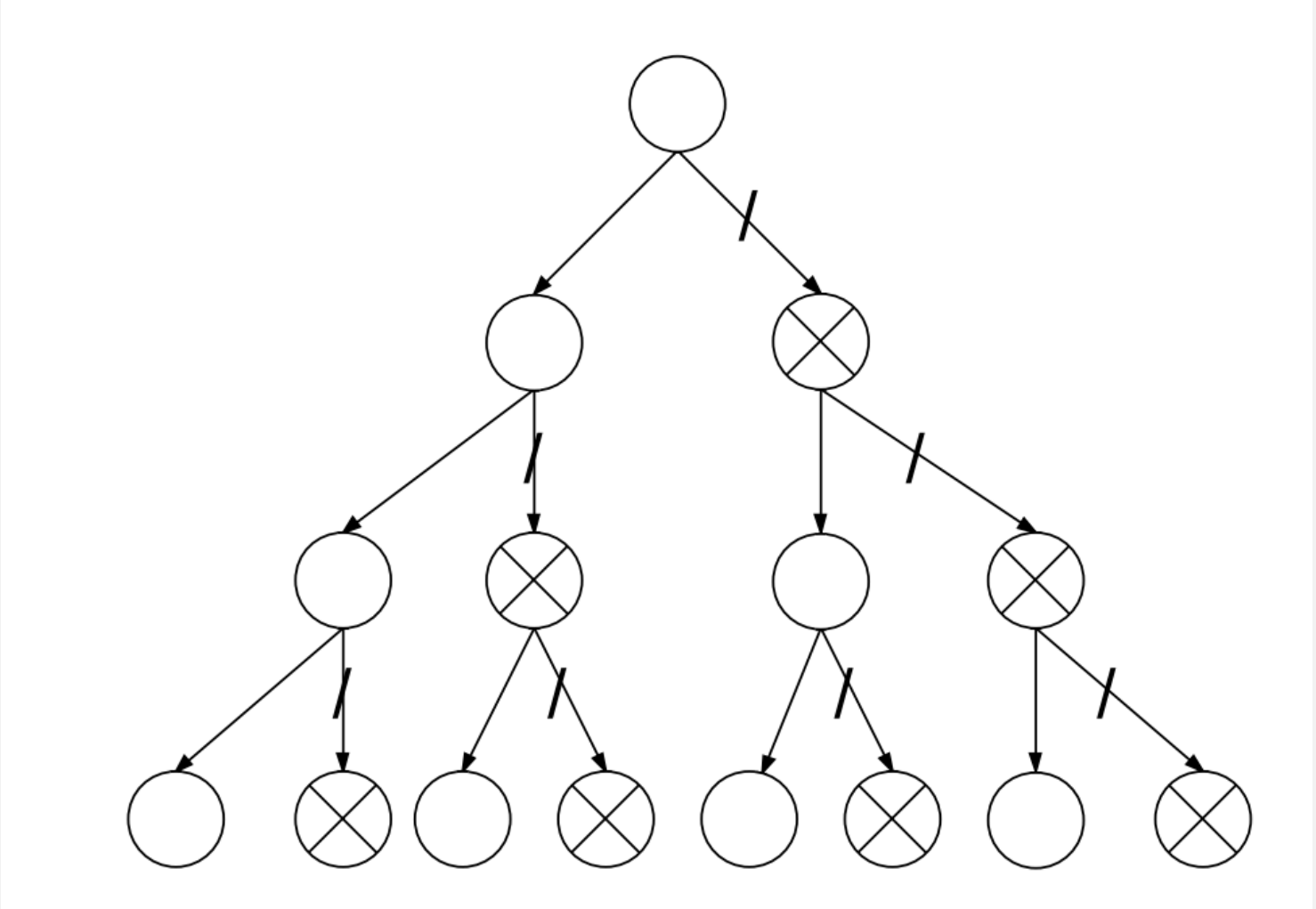
- The average number of secondary infections caused by a single typical infectious individual over their lifetime when introduced into a completely susceptible population.

Depends on properties of both the bug and the population

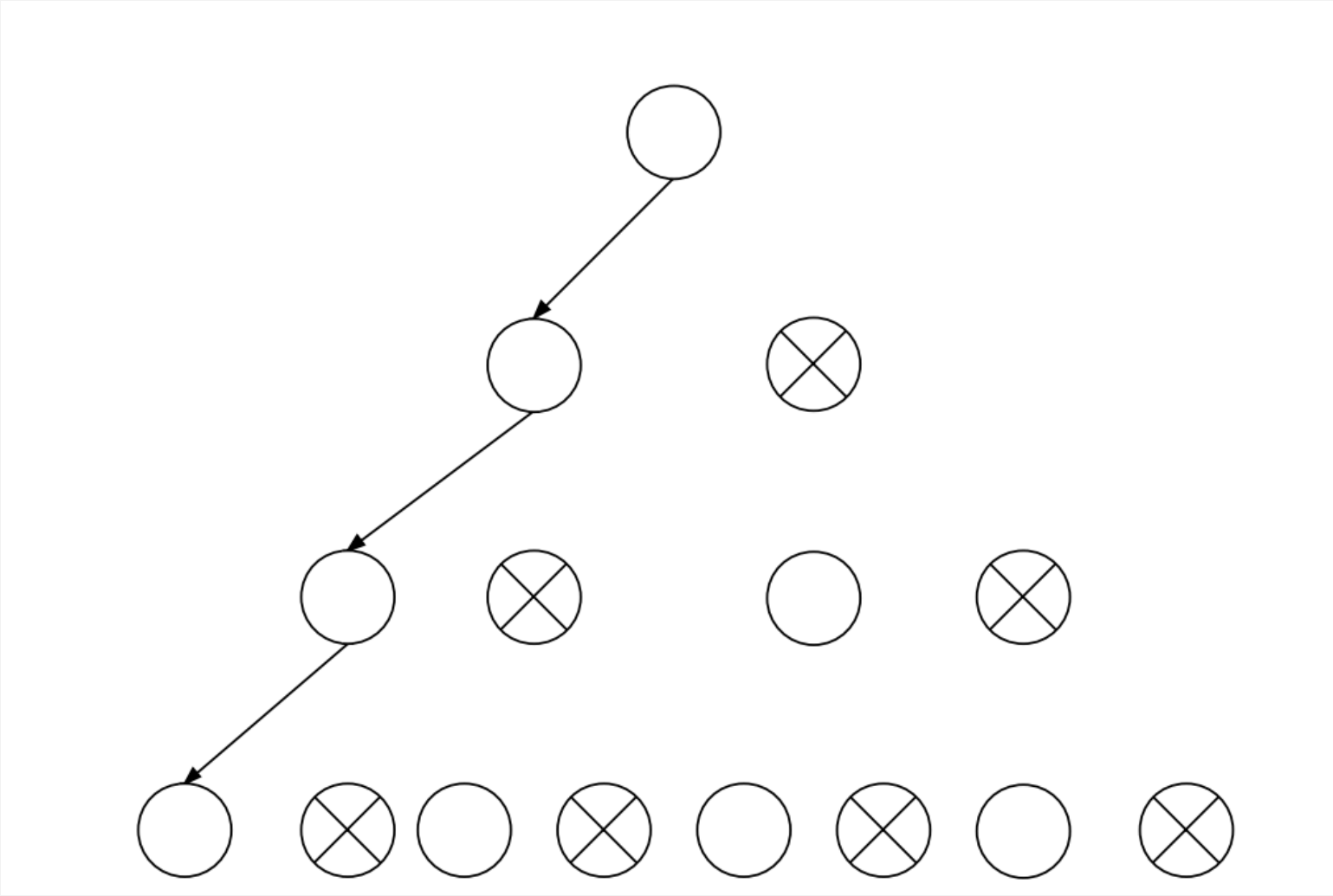
What happens



Effect of immunity…



Effect of immunity…



Herd immunity

Herd immunity is the fact that a population is protected when not everyone is immune.

Effective reproduction number, R

The effective (or net) reproduction number takes into account the current state of the population:

- not everyone in the population is susceptible
- changes in contact rate etc.

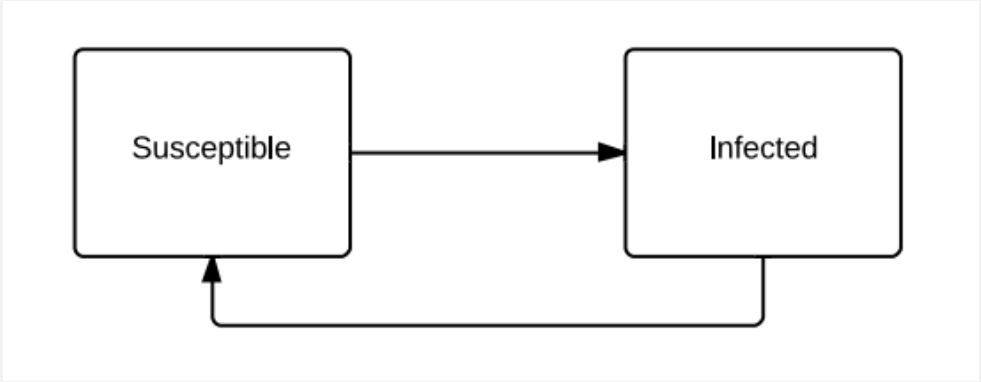
Also written as Re or Rt .

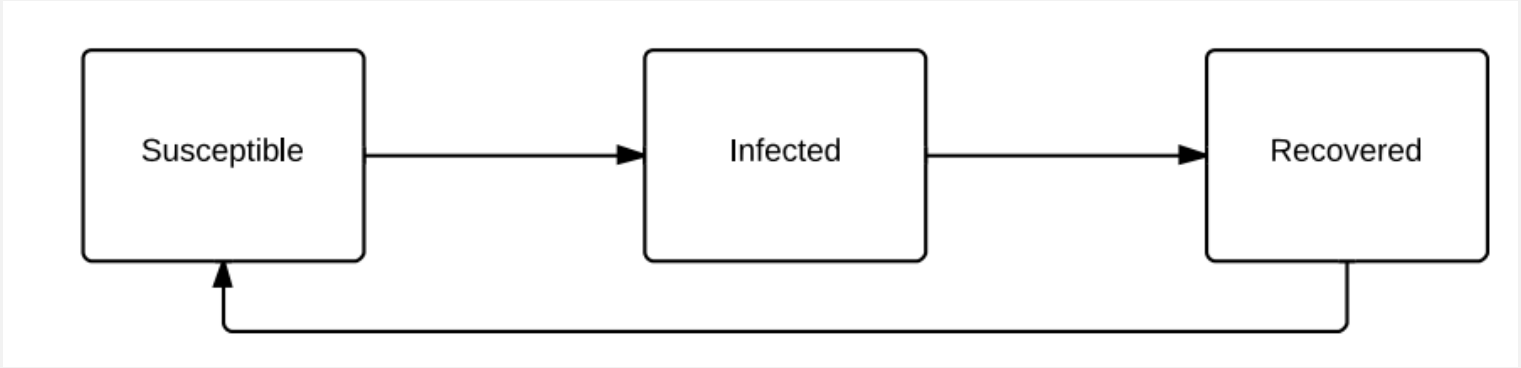
When R falls below 1, the infection will not propagate.

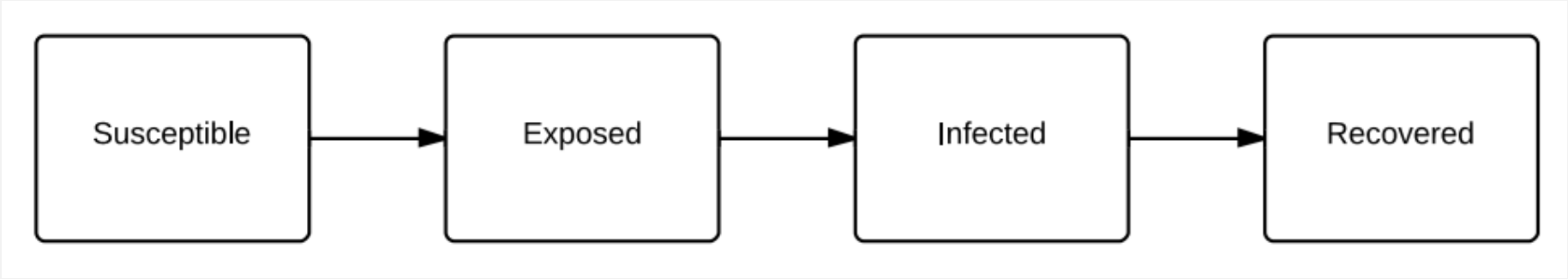
Recall the previous figures…

- We had R0 = 2
- R = R0 × fraction susceptible = 2 × 1/2 = 1
- Immunizing more than half of the population will reduce R below 1

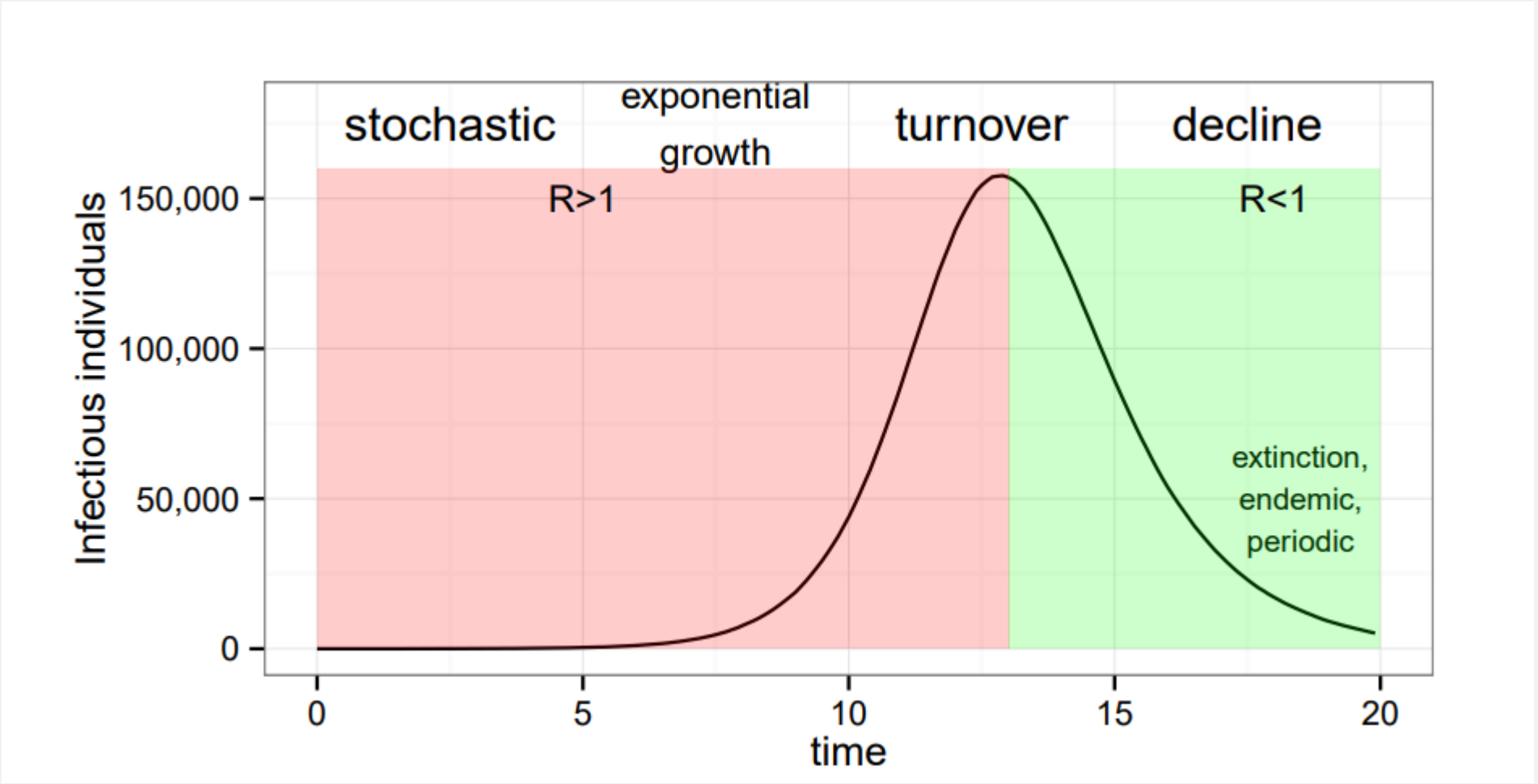
Reality is a bit more complicated…







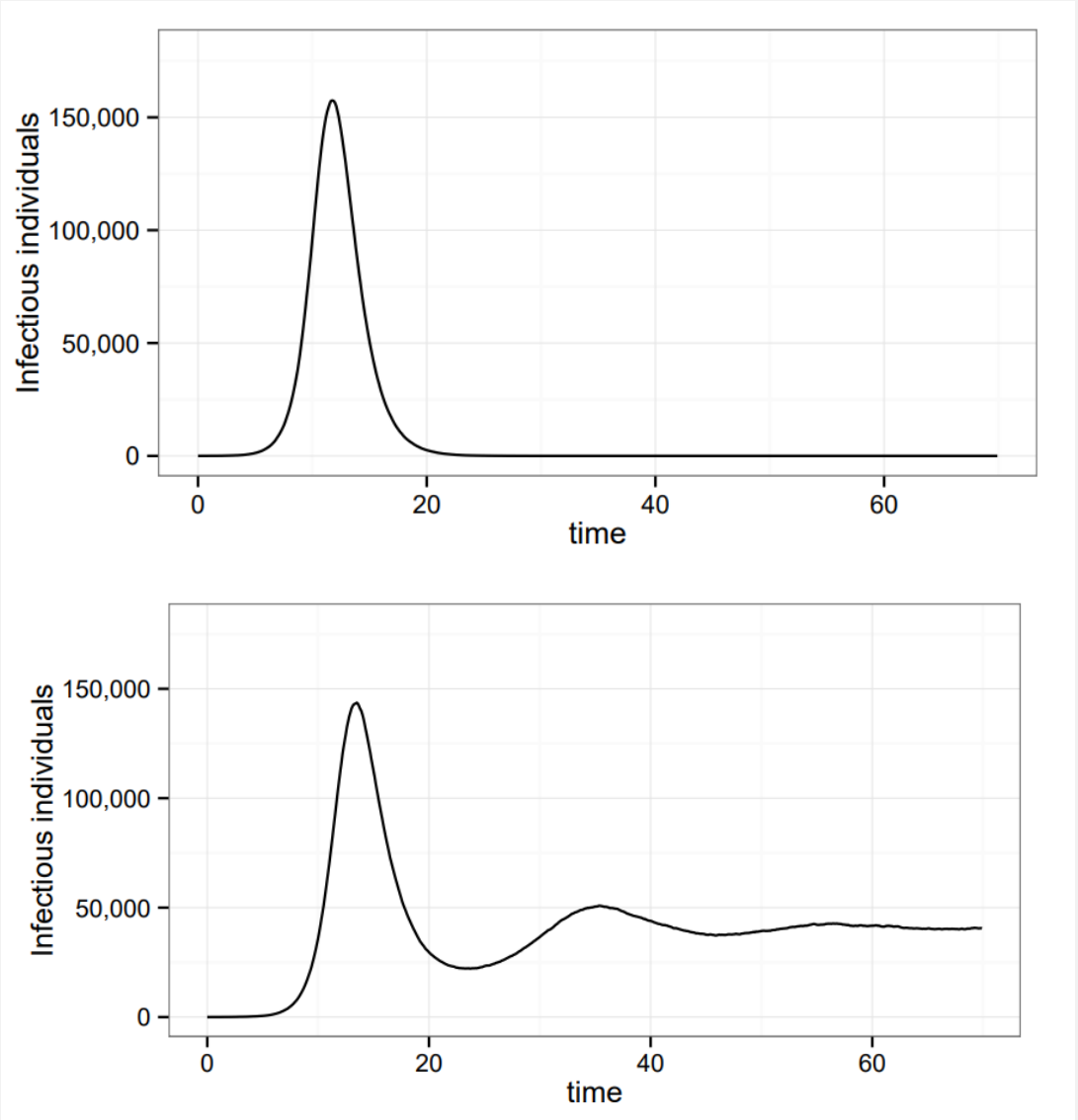
SIR epidemic curve



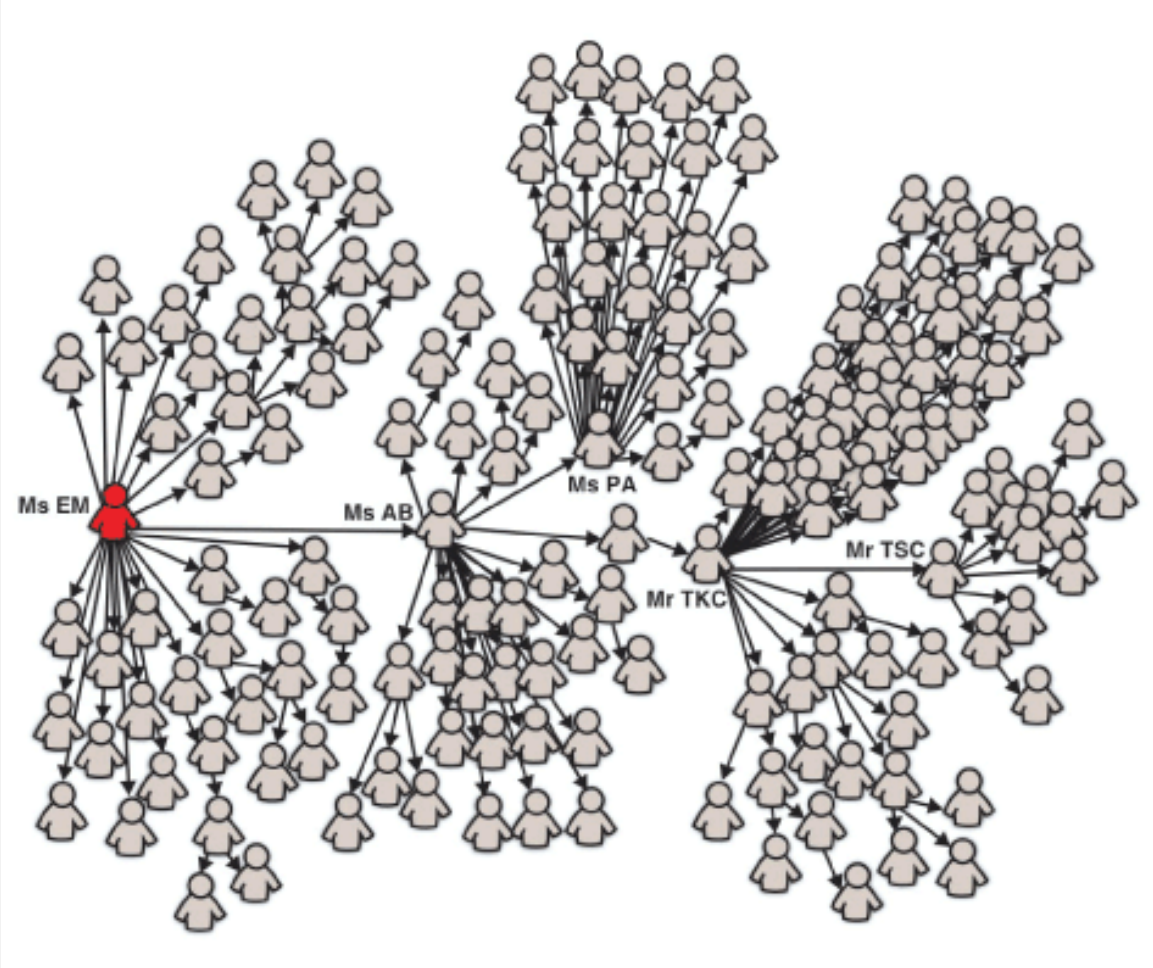
What happens in the end…

- ***EXTINCTION***

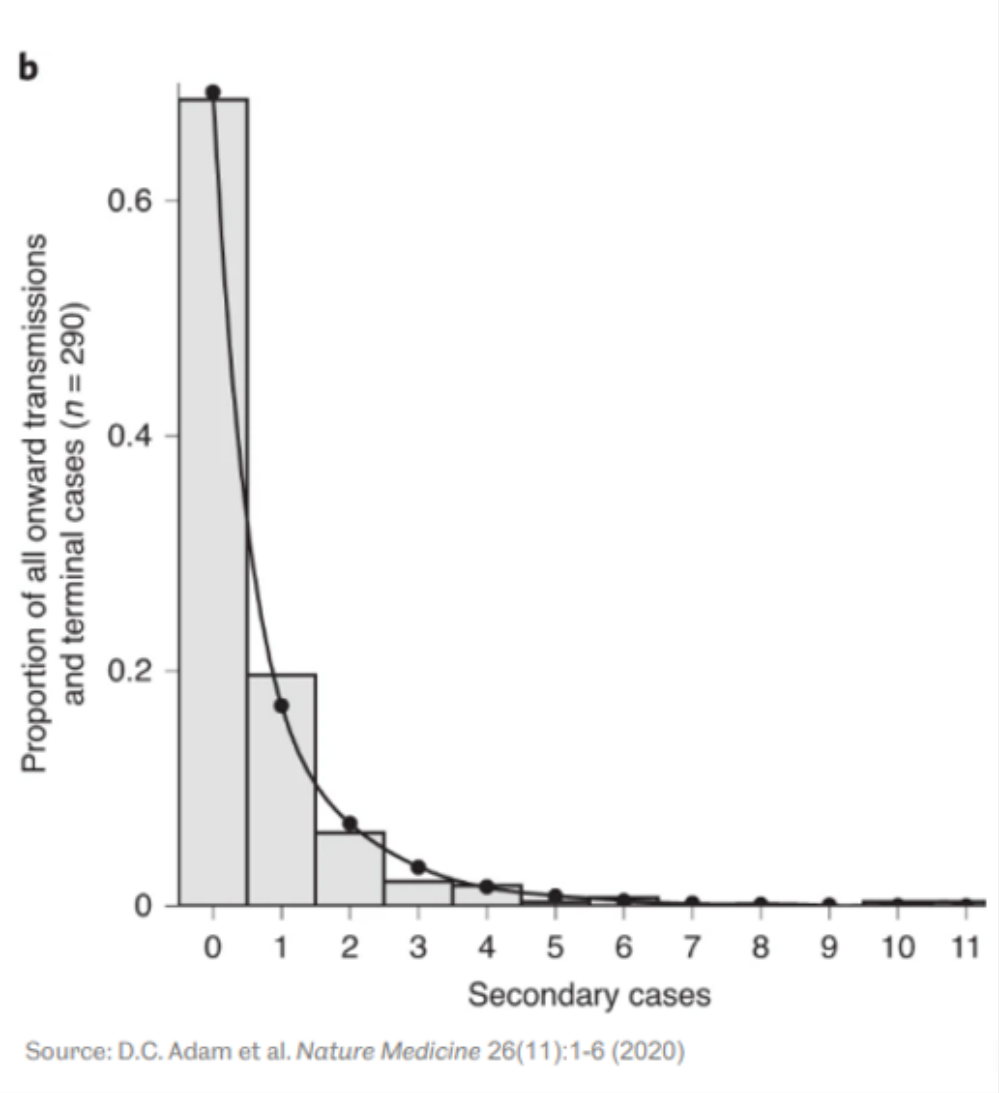
- ***ENDEMICITY***



Superspreading …. Not all infected individuals are equal!



Source: World Health Organization Regional Office for the Western Pacific 2005



Surveillance

Image source: A Lee 2009

What is surveillance?
And why do it?

What is surveillance?

*"The **systematic and continuous collection, analysis, and interpretation of data**, closely integrated with the timely and coherent **dissemination** of the results and assessment to those who have the right to know so decision-makers can **take action**.*

It is an essential feature of epidemiological and public health practice.

The final phase in the surveillance chain is the application of information for health promotion and disease prevention and control.

A surveillance system includes a functional capacity for data collection, analysis, and dissemination linked to public health programs."

The Dictionary of Epidemiology (6th Edition)

What is surveillance?

Systematic ongoing (regular) data collection

- Usually makes use of already available data
- Cost efficient as no new data collection involved

Uses basic analysis of time, person and place

To ***detect change***

Gather ***timely feedback for action***

Surveillance processes

1) planning and system design

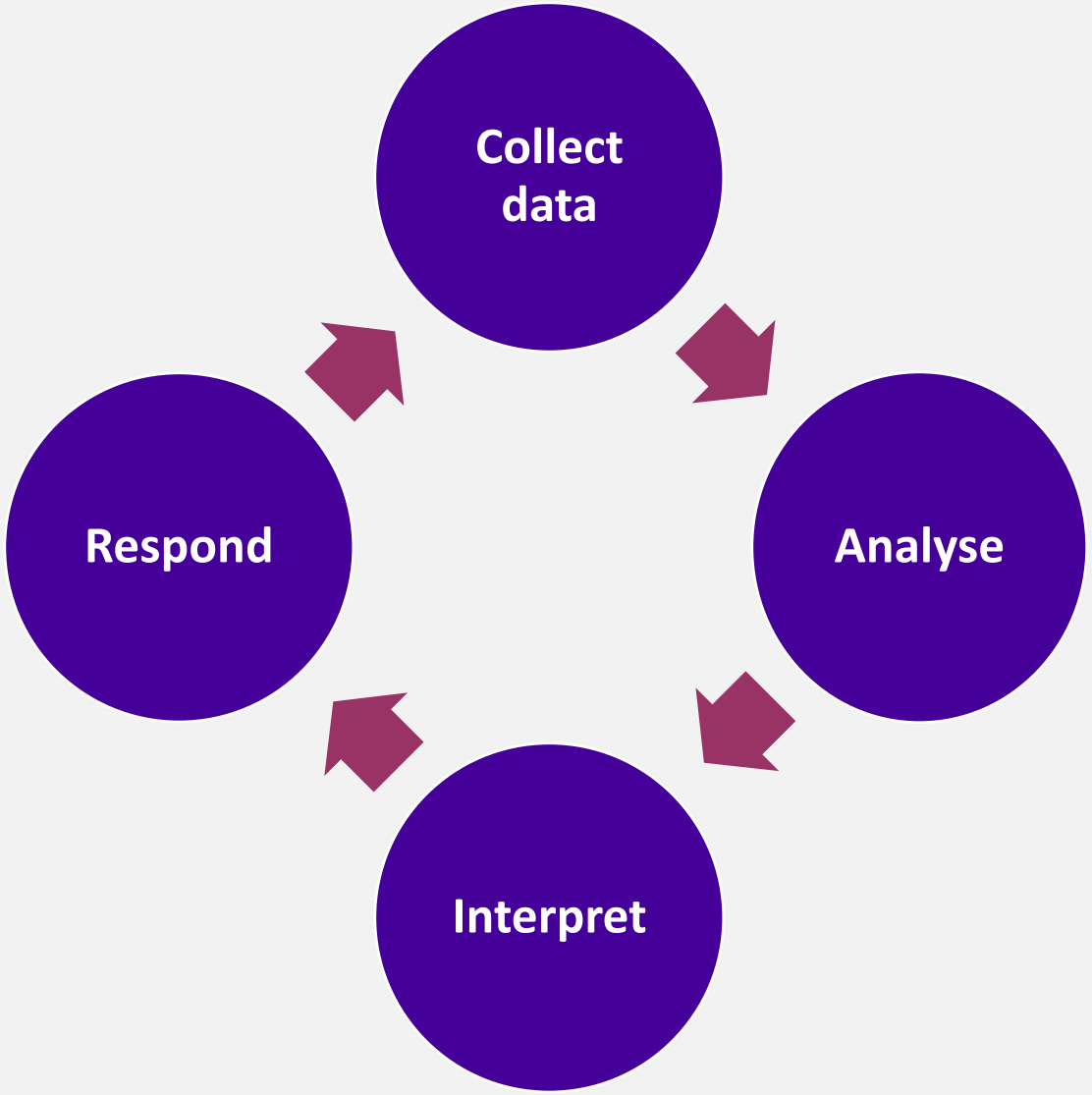
2) data collection

3) data analysis

4) interpretation of results of analysis (i.e., generation of information)

5) dissemination and communication of information, and

6) application of information to public health programs and practice



What are the possible sources of surveillance data?

Surveillance process

Data collection

- Need case definitions, clinical/microbiological criteria

Data sources

- Reports from clinicians e.g. Statutory notifications, KC60
- Lab reports
- Screening e.g. Antenatal, Port Health, Occupational
- Primary care reporting e.g. Sentinel GPs
- Death certification
- Surveillance units e.g. British Paediatric Surveillance Unit (congenital CMV, HIV/AIDS)
- Enhanced surveillance e.g. TB, influenza, meningitis
- International surveillance e.g. GOARN

Surveillance process

Data recording

- Forms and specialized computer databases

Analyse data

- By time, person, place. Look for clusters

Interpretation

- Look for trends and risk factors

Response

- Preventive and control measures
- Feedback to your data providers!
- Evaluate your intervention

Why do surveillance?

Detection of any changes in a disease

- Outbreak detection, Early warning, Forecasting

Track changes in disease

- Extent and severity of disease, identify risk factors
- Allows development of interventions targeted at vulnerable groups

Detection of new diseases

- Provides aetiological clues/hypothesis generation

Monitoring and evaluation of preventive and control measures

Aid prioritisation decisions

Why might surveillance figures be wrong?

Explaining surveillance data

Reflects a true change in disease incidence

- Is it an outbreak?
- Is it seasonal variation?

Spurious/artefactual e.g. clinics fail to notify, incorrect recording

Change in diagnostic method

Change in attention of observer

Change in observer

Random variation

Important caveats

Surveillance rarely measures disease incidence

Often measures a ***proxy*** measure of disease incidence

If surveillance covers a large area or population, small changes in actual disease incidence may be hidden.

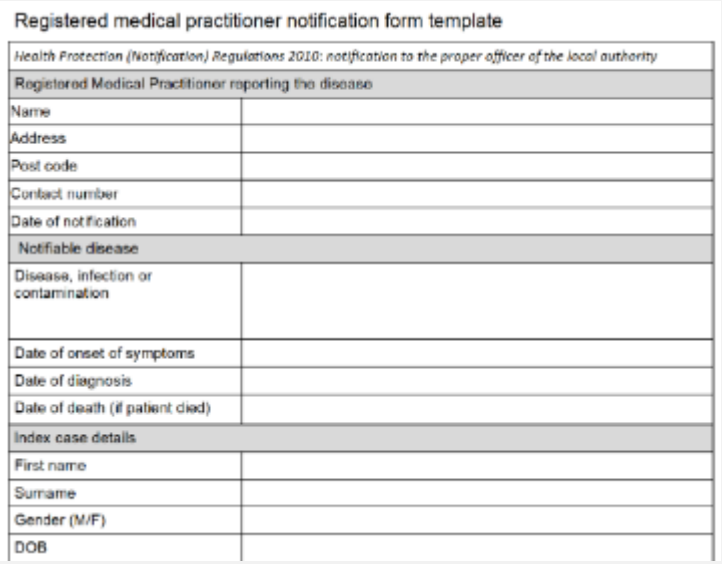
Challenges with case definitions & period of observation

Challenges with comparability of populations and contexts
(are we comparing like with like?)

Types of surveillance

Passive surveillance

- Most surveillance systems are of this type
- E.g. routine laboratory or clinician notifications of disease to surveillance centre
  - ➢ https://www.gov.uk/government/collections/notifications-of-infectious-diseases-noids
- Degree of incompleteness



Registered medical practitioner notification form template

Health Protection (Notification) Regulations 2010: notification to the proper officer of the local authority	
Registered Medical Practitioner reporting the disease	
Name	
Address	
Post code	
Contact number	
Date of notification	
Notifiable disease	
Disease, infection or contamination	
Date of onset of symptoms	
Date of diagnosis	
Date of death (if patient died)	
Index case details	
First name	
Surname	
Gender (M/F)	
DOB	

Sentinel surveillance

- Type of ‘sample surveillance’, e.g. sentinel general practices in the UK
- Works best for common diseases e.g. Viral gastroenteritis, influenza-like illnesses
- More likely to miss rarer conditions

Types of surveillance

Active surveillance

- Used in situations when completeness of reporting required
- Requires *negative reporting*
- Examples
  - for rare conditions, e.g. Reye syndrome
  - serious or highly contagious diseases, e.g. Ebola, SARS
  - monitoring of vaccine failure, e.g. Haemophilus influenza
  - Where goal is eradication of disease, e.g. Polio, small pox
  - where public health intervention required, e.g. Meningococcal disease

Enhanced surveillance

- Form of active surveillance
- Usually limited to a specific area, time period and disease type
- E.g. Pre-introduction of meningococcal C vaccine, TB, HIV

Types of surveillance

Surveillance of disease

Surveillance of determinants of disease

Surveillance of animal and bird reservoirs

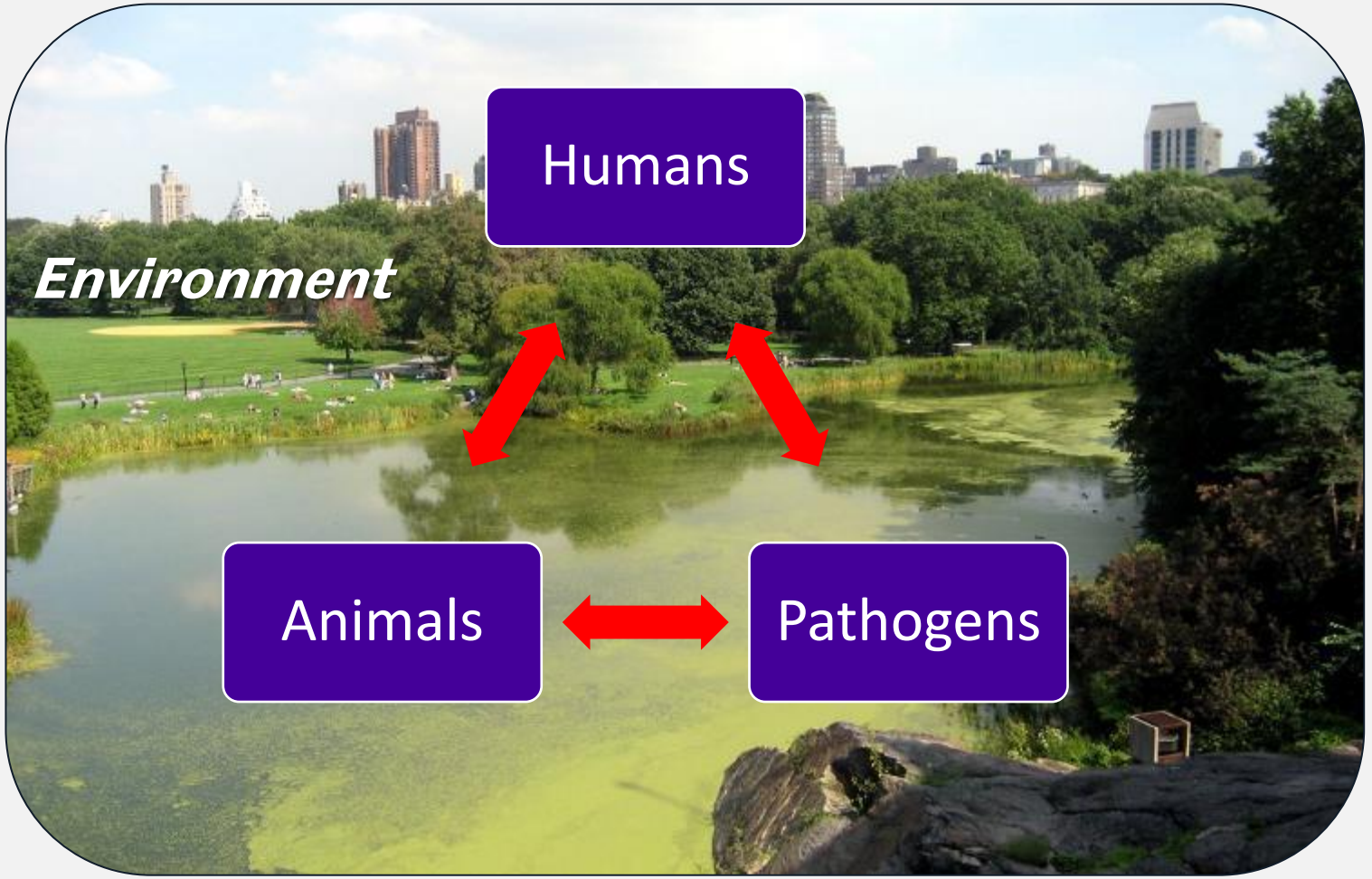
Reality is complex!

Complex Adaptive Systems

- 3 core characteristics:

  - ***heterogeneous agents*** (e.g., people, organizations, animals, pathogens, etc.)
  - agents ***interact with each other and evolve*** their behavior over time.
  - interactions can lead to a pattern called ***emergence***, where the network of actors behaves in difficult-to-understand ways.
    - Emergence disguises cause and effect in both positive and negative ways
    - Can’t understand the system just by looking at individual agents or actors.

Wider determinants



Integrated Disease Surveillance & Response (IDSR)

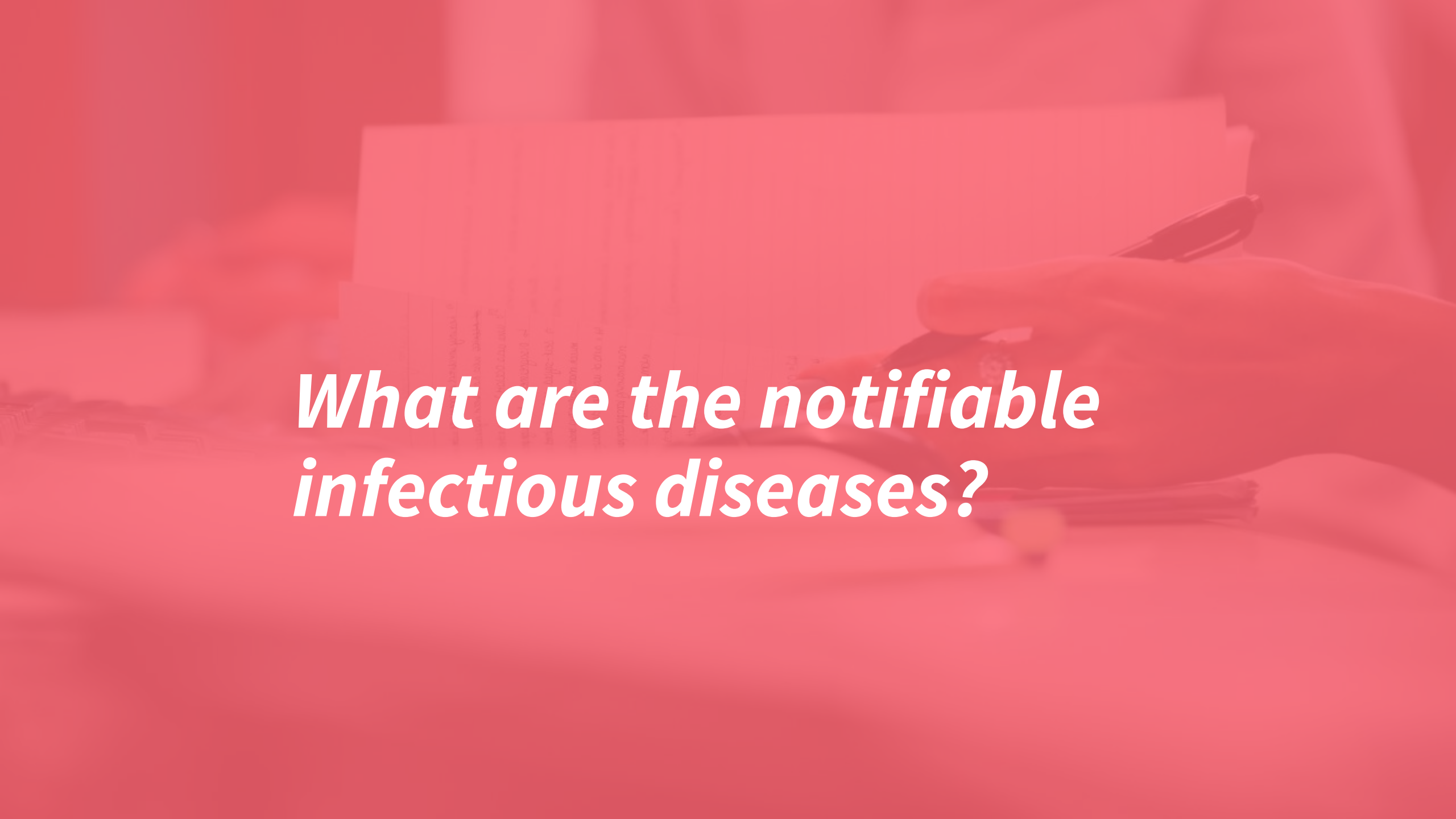
"The goal of [integrated disease surveillance and response] is to efficiently integrate multiple 'categorical' surveillance and response systems and linking surveillance, laboratory, and other data with public health action."

– Ibrahima Socé Fall, et al.

One example is IDSR technical guidelines developed by WHO/AFRO, based on 2 frameworks:

- Event-based and indicator-based surveillance framework
- Disease priority framework
- Plus a focus on integration as part of a One Health approach to handle zoonotic/ vector-borne disease. Requires interdisciplinary approach beyond human healthcare.

What might you want to carry out surveillance on?



What are the notifiable infectious diseases?

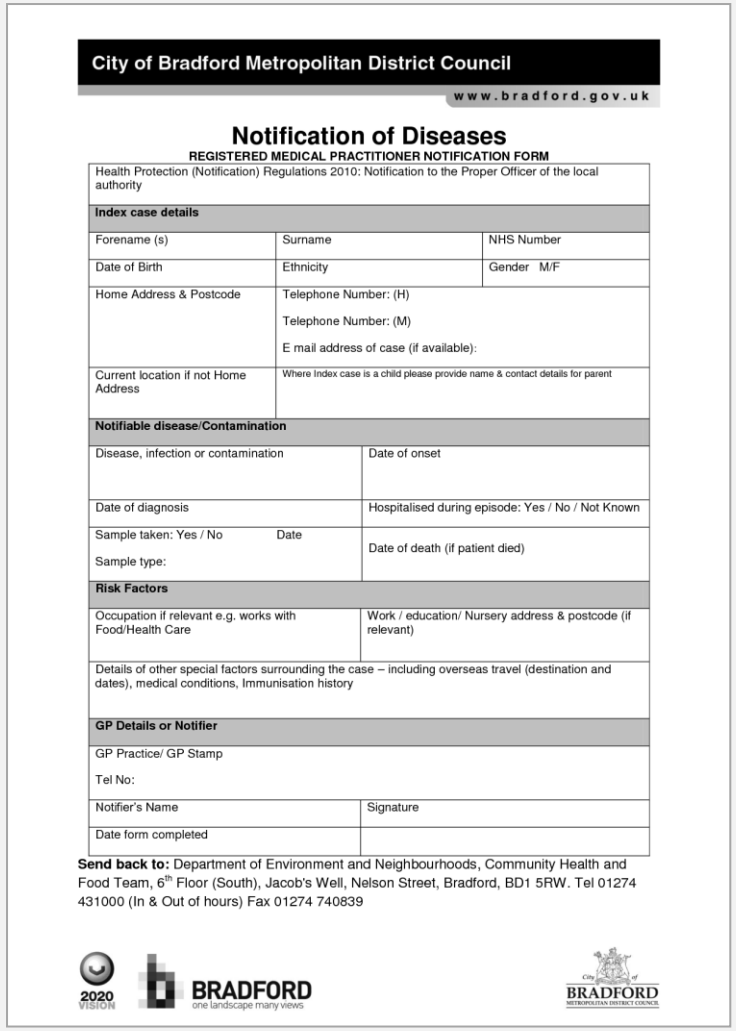
Why notify?

Need to prevent further cases!

The notifiable diseases are diseases, infections and conditions that are specifically listed as notifiable under the Public Health (Infectious Diseases) Regulations 1988

For notifiable diseases, duty on any doctor that suspects a case to inform the Proper Officer of the Local Authority

This is a LEGAL OBLIGATION



City of Bradford Metropolitan District Council

www.bradford.gov.uk

Notification of Diseases

REGISTERED MEDICAL PRACTITIONER NOTIFICATION FORM

Health Protection (Notification) Regulations 2010: Notification to the Proper Officer of the local authority

Index case details

Forename (s)	Surname	NHS Number
Date of Birth	Ethnicity	Gender M/F
Home Address & Postcode	Telephone Number: (H) Telephone Number: (M) E mail address of case (if available):	
Current location if not Home Address	Where Index case is a child please provide name & contact details for parent	

Notifiable disease/Contamination

Disease, infection or contamination	Date of onset
Date of diagnosis	Hospitalised during episode: Yes / No / Not Known
Sample taken: Yes / No Date Sample type:	Date of death (if patient died)

Risk Factors

Occupation if relevant e.g. works with Food/Health Care	Work / education/ Nursery address & postcode (if relevant)
Details of other special factors surrounding the case – including overseas travel (destination and dates), medical conditions, Immunisation history	

GP Details or Notifier

GP Practice/ GP Stamp Tel No:	
Notifier's Name	Signature
Date form completed	

Send back to: Department of Environment and Neighbourhoods, Community Health and Food Team, 6th Floor (South), Jacob's Well, Nelson Street, Bradford, BD1 5RW. Tel 01274 431000 (In & Out of hours) Fax 01274 740839

2020 VISION BRADFORD one landscape many views City of BRADFORD METROPOLITAN DISTRICT COUNCIL

What are the notifiable diseases?

Includes a long list of nasty infectious diseases:

- *Acute encephalitis,*
- *Anthrax,*
- *Cholera,*
- *Leprosy,*
- *Leptospirosis,*
- *Malaria,*
- *Ophthalmia neonatorum,*
- *Paratyphoid fever,*
- *Plague,*
- *Rabies,*
- *Relapsing fever,*
- *Scarlet fever,*
- *Smallpox,*
- *Typhoid fever,*
- *Typhus fever,*
- *Viral haemorrhagic fever,*
- *Yellow fever,*
- *Viral hepatitis*

What are the notifiable diseases?

Also notifiable are the vaccine preventable infectious diseases:

- *Acute poliomyelitis*
- *Diphtheria*
- *Measles*
- *Meningitis and Meningococcal septicaemia*
- *Mumps*
- *Rubella*
- *Tetanus*
- *Whooping cough*

What are the notifiable diseases?

... as well as the controllable/containable infectious diseases:

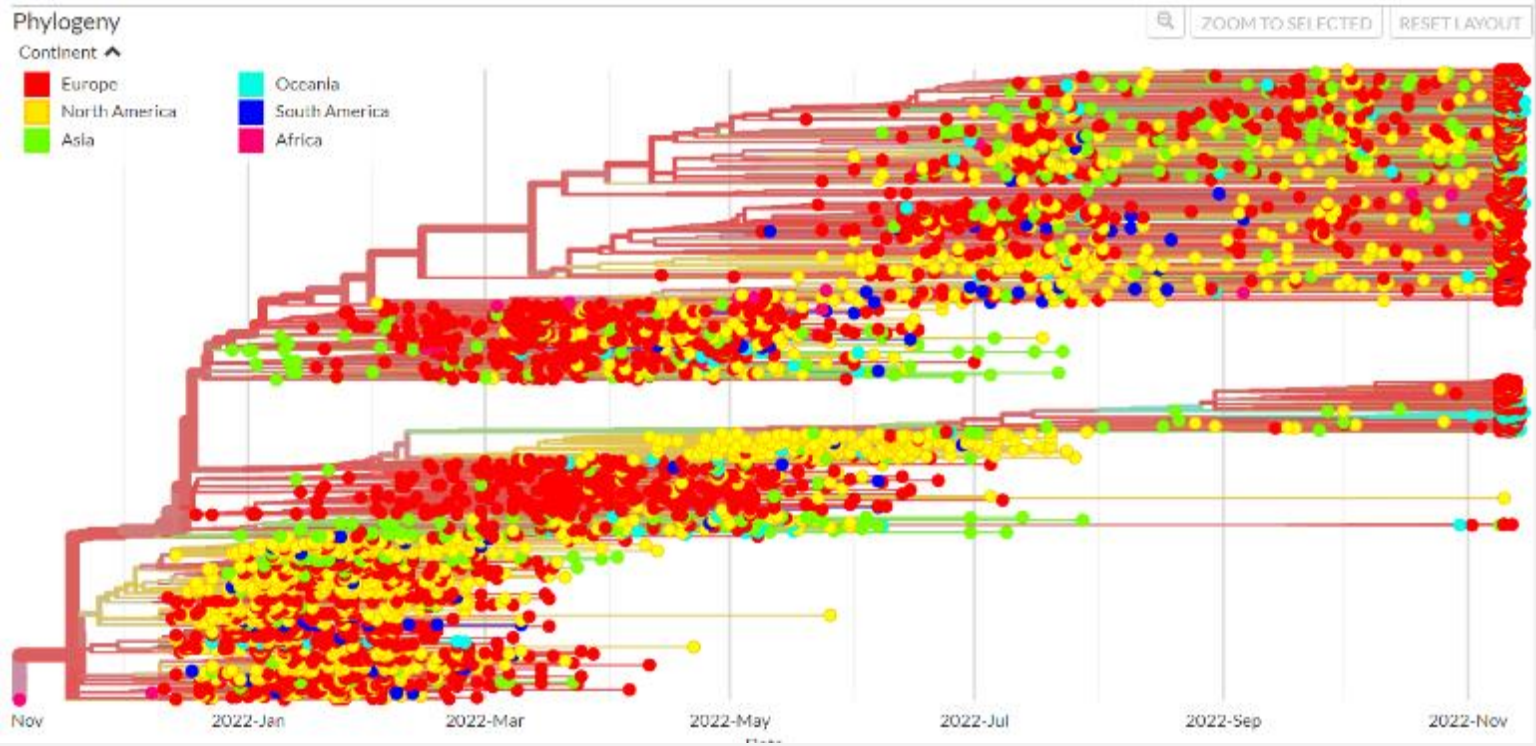
- *Food poisoning/dysentery*
- *Tuberculosis*
- *Viral hepatitis (HAV, HBV, HCV)*

Latest developments: COVID19 pandemic response

Phylodynamics of pandemic coronavirus variant VOC Omicron GRA (B.1.1.529+BA.*) first detected in Botswana/Hong Kong/South Africa

Showing 4,000 of 4,000 genomes collected between Nov 2021 and Nov 2022, last updated 2022-11-21

Source: GISAID



Local, national and global surveillance

Epidemiological surveillance

Wastewater surveillance

Genomic surveillance

Research

- Reinfections
- Durability of immunity
- Long Covid
- Population behaviour

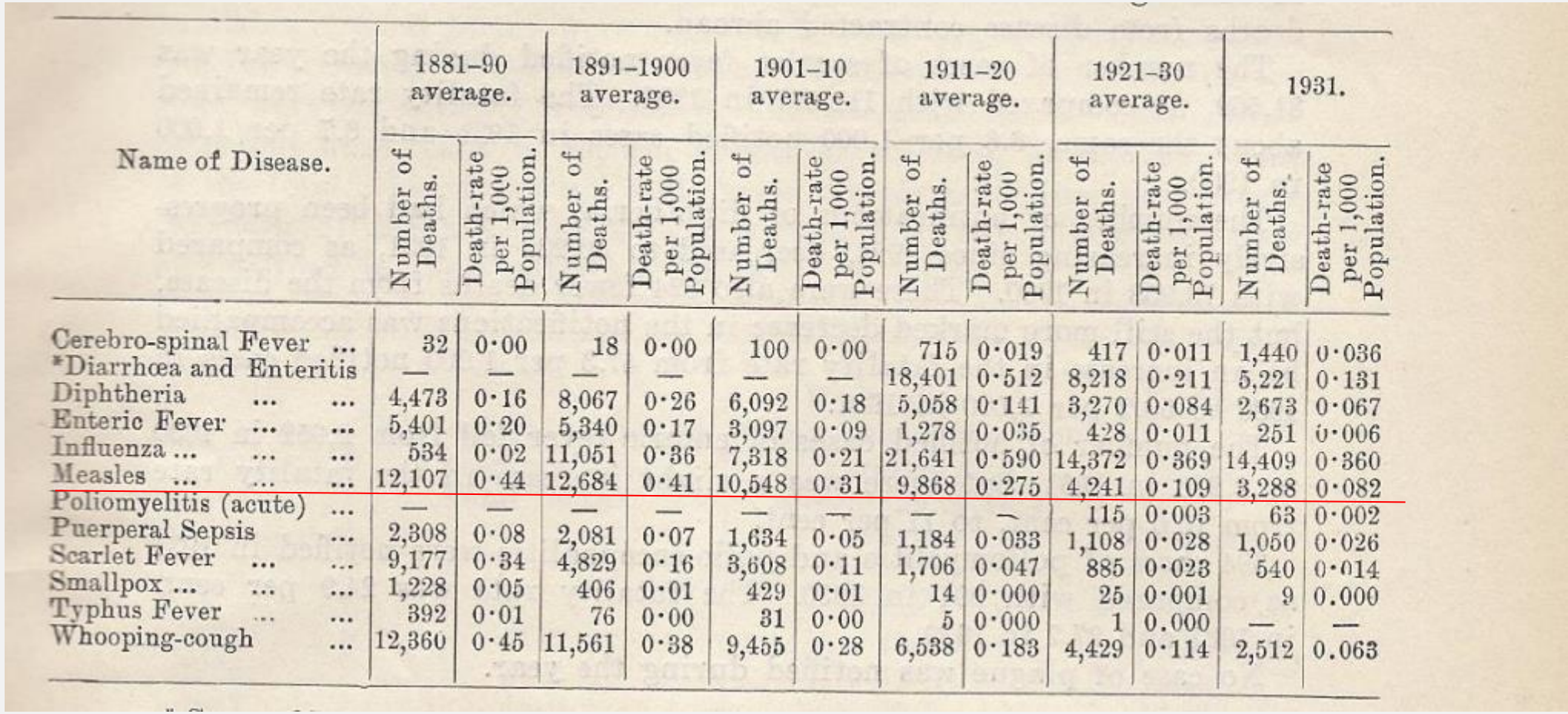
Rapid evidence reviews

Vaccine efficacy studies

Examples of surveillance in action

Case study 1: Measles in England

Before the introduction of vaccine, hundreds of thousands of Measles cases in each epidemic year

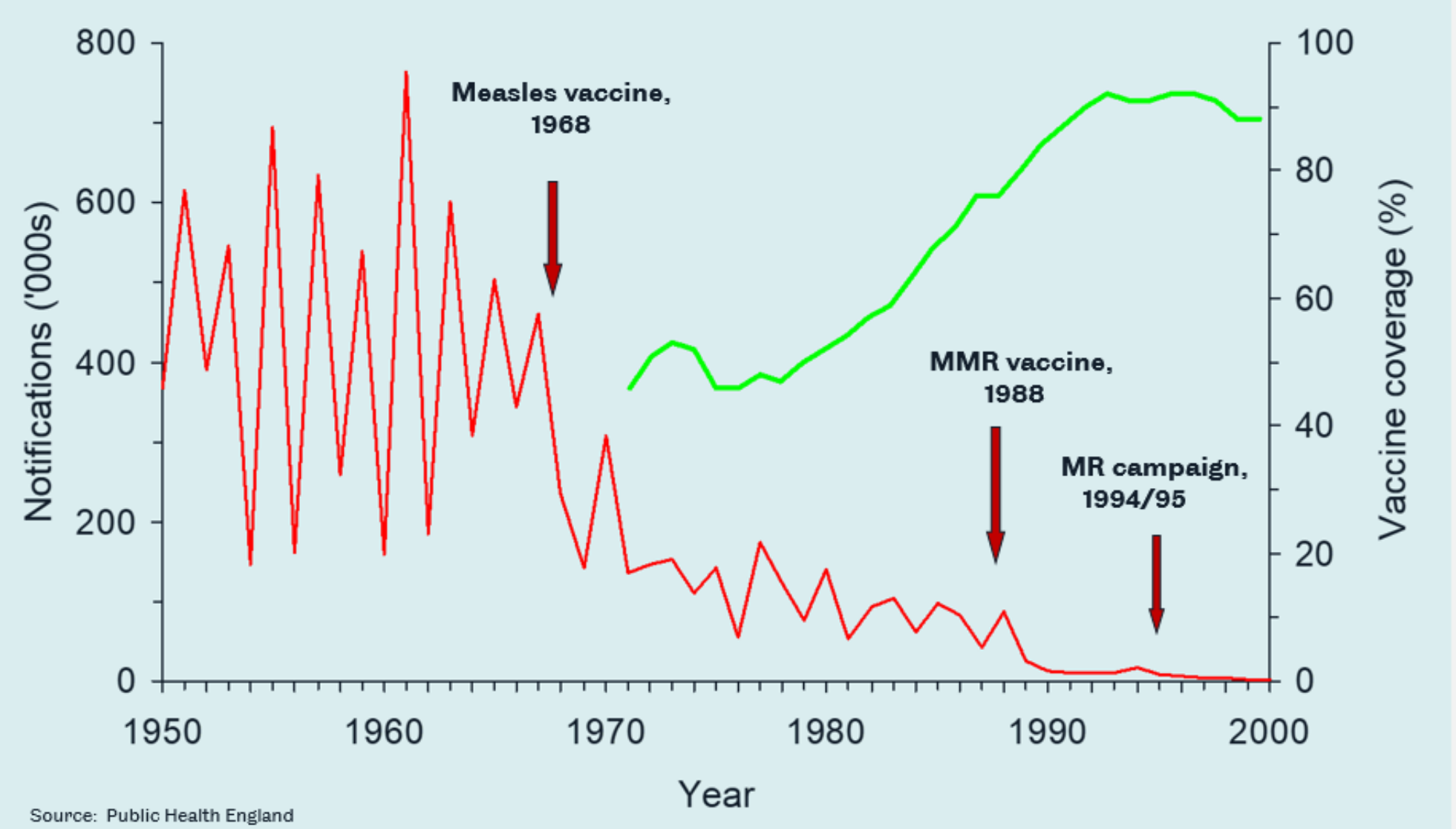


Name of Disease.	1881–90 average.		1891–1900 average.		1901–10 average.		1911–20 average.		1921–30 average.		1931.	
	Number of Deaths.	Death-rate per 1,000 Population.	Number of Deaths.	Death-rate per 1,000 Population.	Number of Deaths.	Death-rate per 1,000 Population.	Number of Deaths.	Death-rate per 1,000 Population.	Number of Deaths.	Death-rate per 1,000 Population.	Number of Deaths.	Death-rate per 1,000 Population.
Cerebro-spinal Fever ...	32	0·00	18	0·00	100	0·00	715	0·019	417	0·011	1,440	0·036
*Diarrhœa and Enteritis	—	—	—	—	—	—	18,401	0·512	8,218	0·211	5,221	0·131
Diphtheria	4,473	0·16	8,067	0·26	6,092	0·18	5,058	0·141	3,270	0·084	2,673	0·067
Enteric Fever	5,401	0·20	5,340	0·17	3,097	0·09	1,278	0·035	428	0·011	251	0·006
Influenza	534	0·02	11,051	0·36	7,318	0·21	21,641	0·590	14,372	0·369	14,409	0·360
Measles	12,107	0·44	12,684	0·41	10,548	0·31	9,868	0·275	4,241	0·109	3,288	0·082
Poliomyelitis (acute) ...	—	—	—	—	—	—	—	—	115	0·003	63	0·002
Puerperal Sepsis ...	2,308	0·08	2,081	0·07	1,634	0·05	1,184	0·033	1,108	0·028	1,050	0·026
Scarlet Fever	9,177	0·34	4,829	0·16	3,608	0·11	1,706	0·047	885	0·023	540	0·014
Smallpox	1,228	0·05	406	0·01	429	0·01	14	0·000	25	0·001	9	0.000
Typhus Fever	392	0·01	76	0·00	31	0·00	5	0·000	1	0.000	—	—
Whooping-cough ...	12,360	0·45	11,561	0·38	9,455	0·28	6,538	0·183	4,429	0·114	2,512	0.063

Thirteenth Annual Report of the Ministry of Health 1931-32, HMSO.
(With thanks to Dr Laura Stroud, University of Leeds for this document)

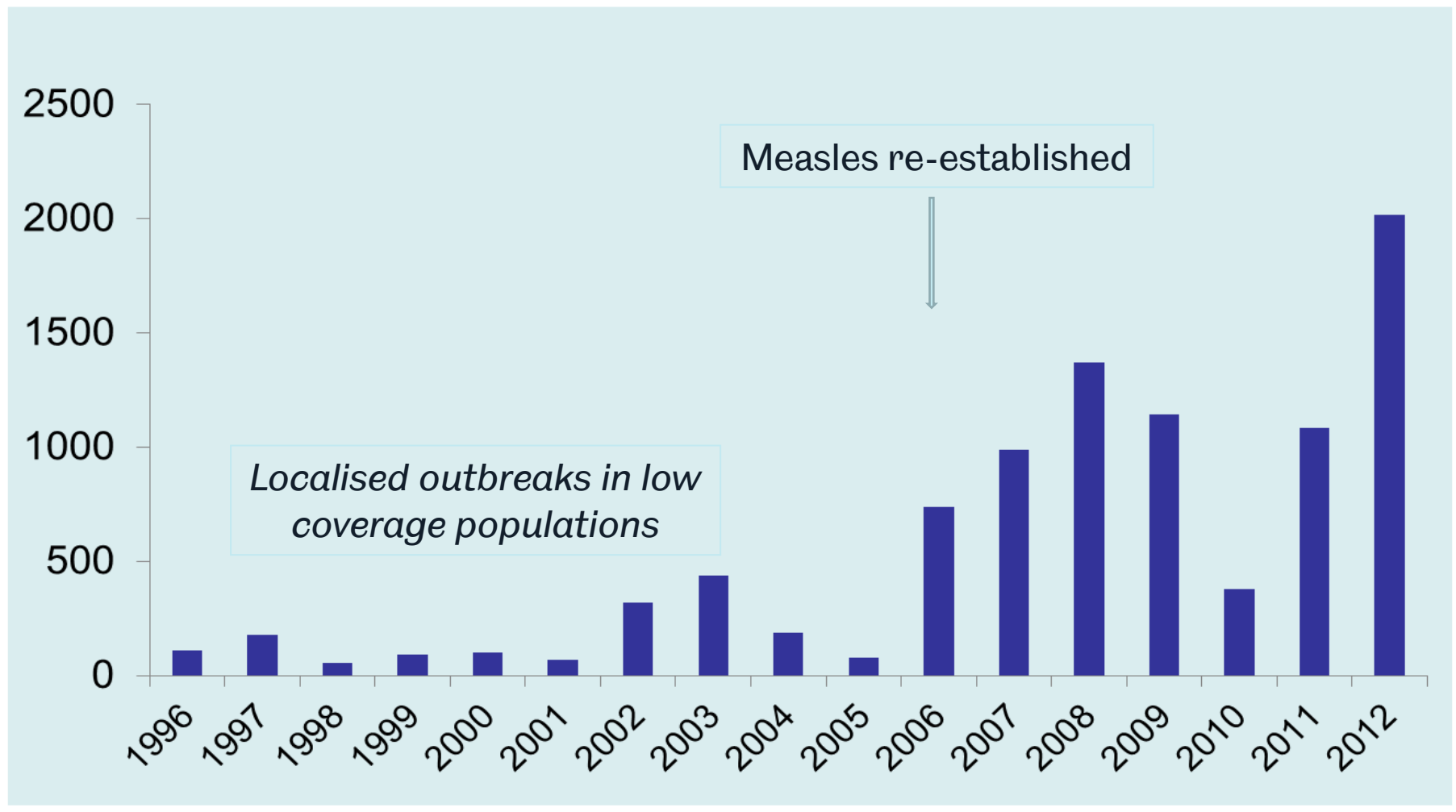
Measuring the effect of vaccination programmes

Annual measles notifications & vaccine coverage, England and Wales, 1950-2000

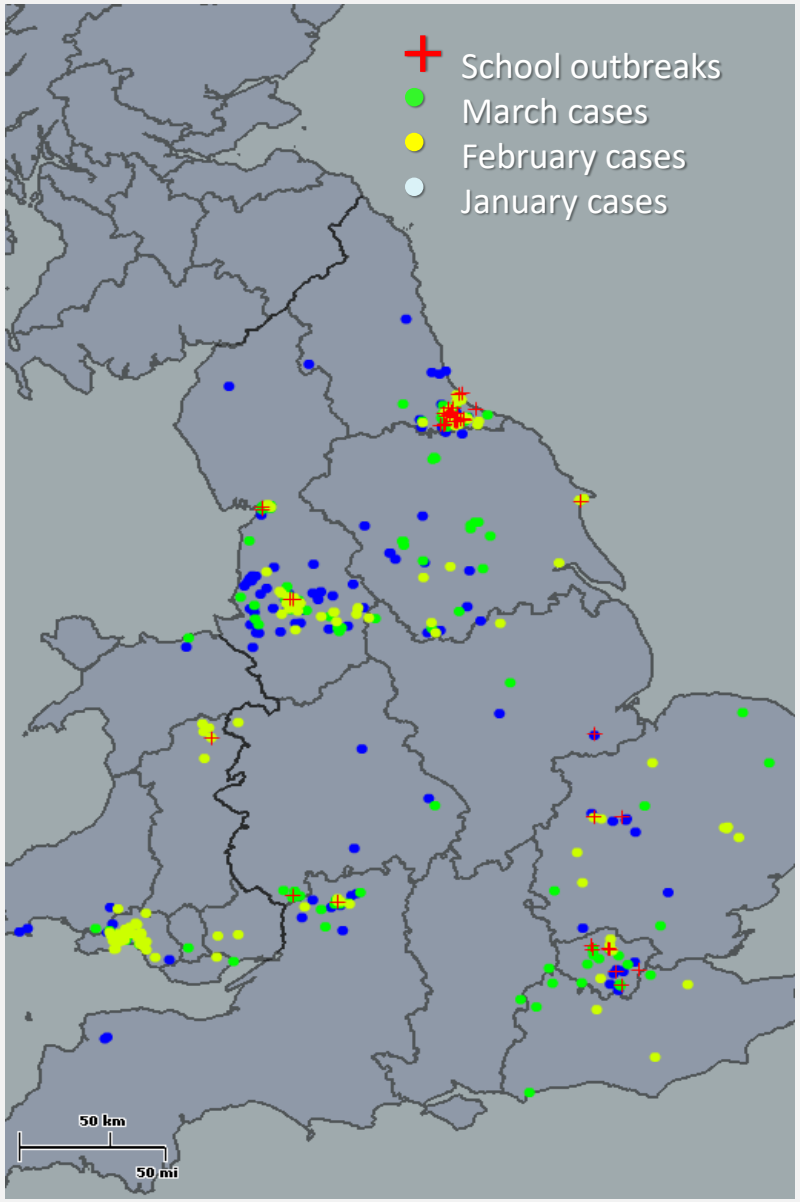


Monitoring for resurgence

Confirmed cases of measles, England & Wales, 1996 to 2012



Where are the cases?

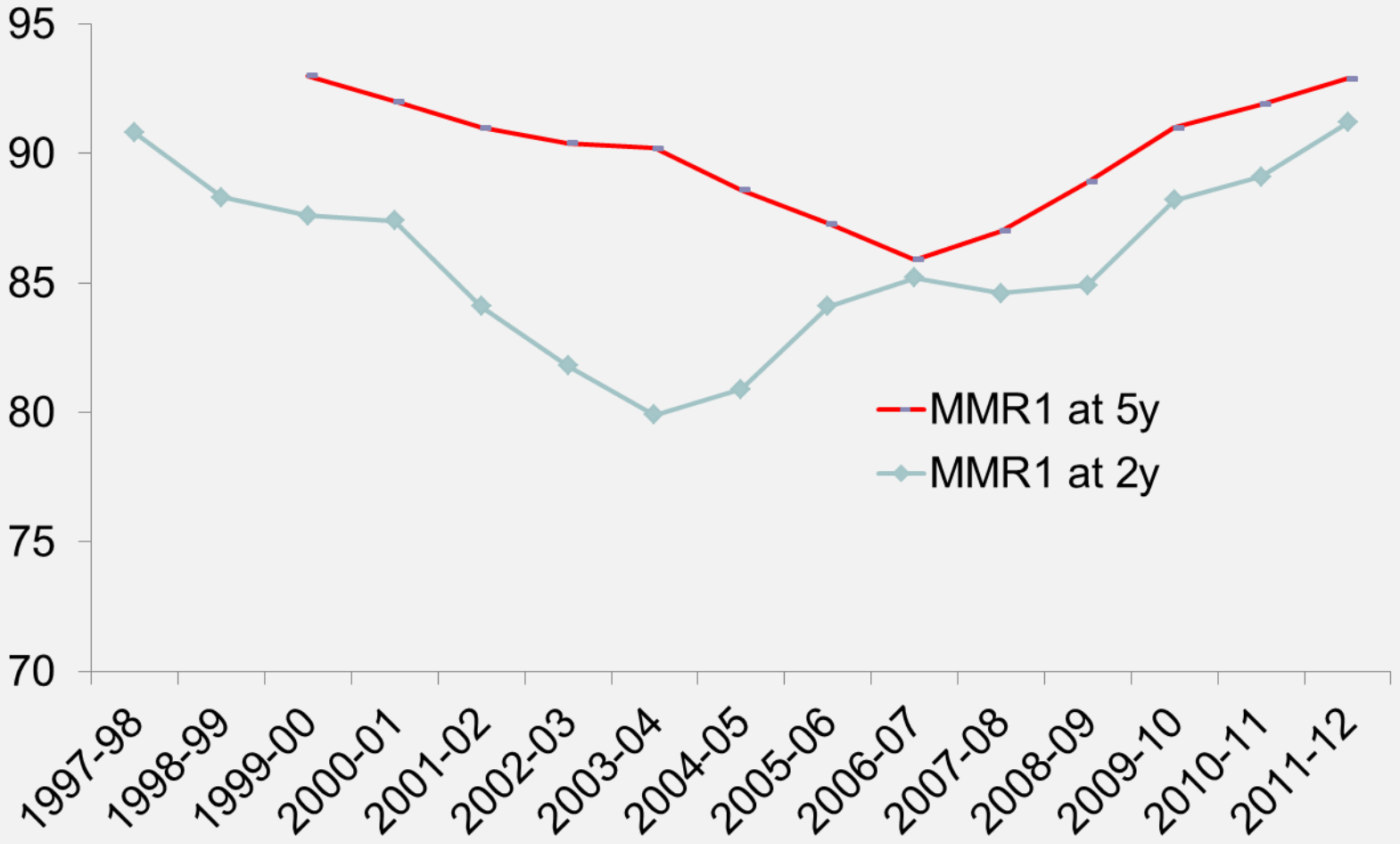


Confirmed measles cases in 2013, England and Wales

- 587 cases in England
- North-East and North-West most affected (in addition to Wales)
- Localised to specific hot-spots
- 119 (20%) cases associated with schools outbreaks

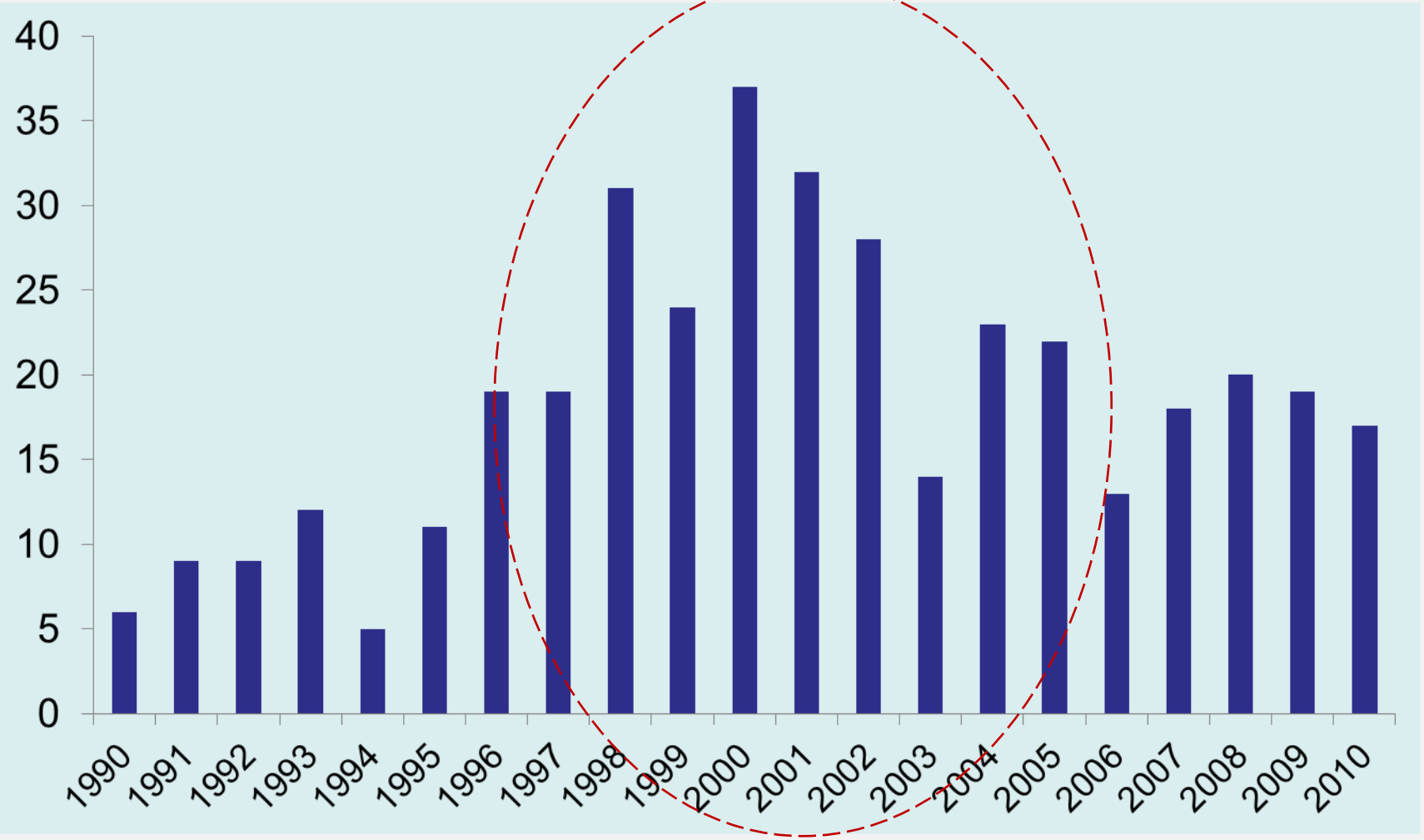
Who is not protected?

MMR coverage at 2 and 5 years of age, England 1997/8-2011/12



Who is getting infected?

Distribution of confirmed measles cases in England by year of birth, 2013



Public health response: MMR Catch-up Programme

- In England: 1,920 confirmed cases in 2012, **587** confirmed cases in first quarter of 2013
- April 2013, MMR catch up programme in England announced
- Aim to increase MMR coverage in older children aged 10-16 years to reach levels achieved in younger children (95%) by 30.9.13

Image source:
CDC Public Health Image Library

Local response

Identifying unvaccinated children

- Child health information systems
- GP registers
- Letters and flyers through the school system

Providing accessible services

- Routine / additional clinics in general practice
- School-based clinics
- Community-based clinics

Longer term sustainability

- Systems in place to check MMR status at all opportunities
- Plans to tackle under-served communities with low coverage

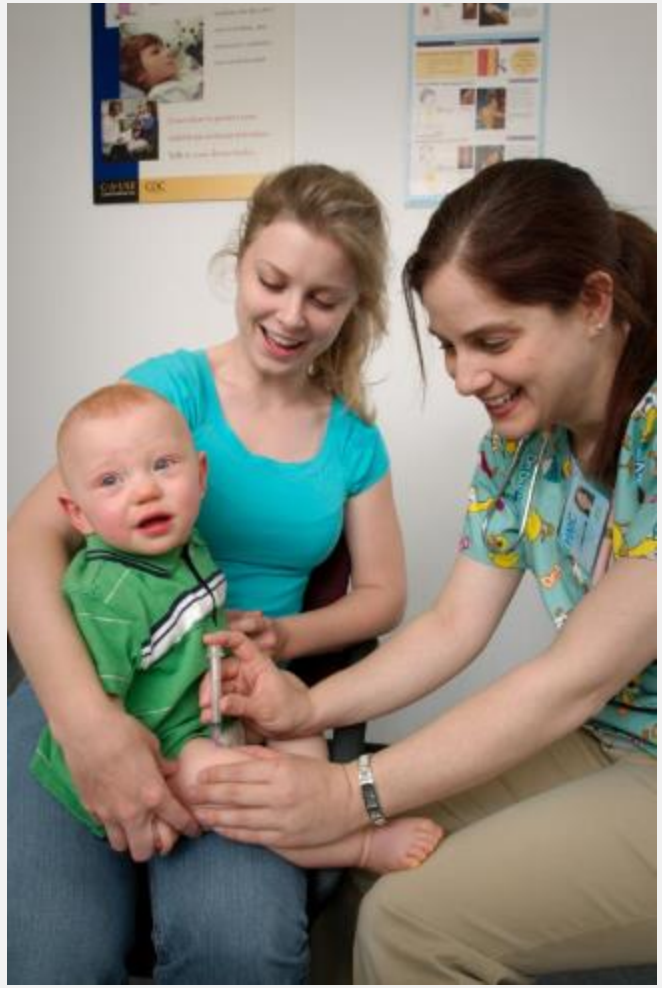


Image source:
CDC Public Health
Image Library

Monitoring the programme

PHE / NHS England tracking

- Confirmed cases of measles
- Vaccine ordering and supply information
- Vaccination status of children on GP registers
- Continue collection of data on routine MMR coverage

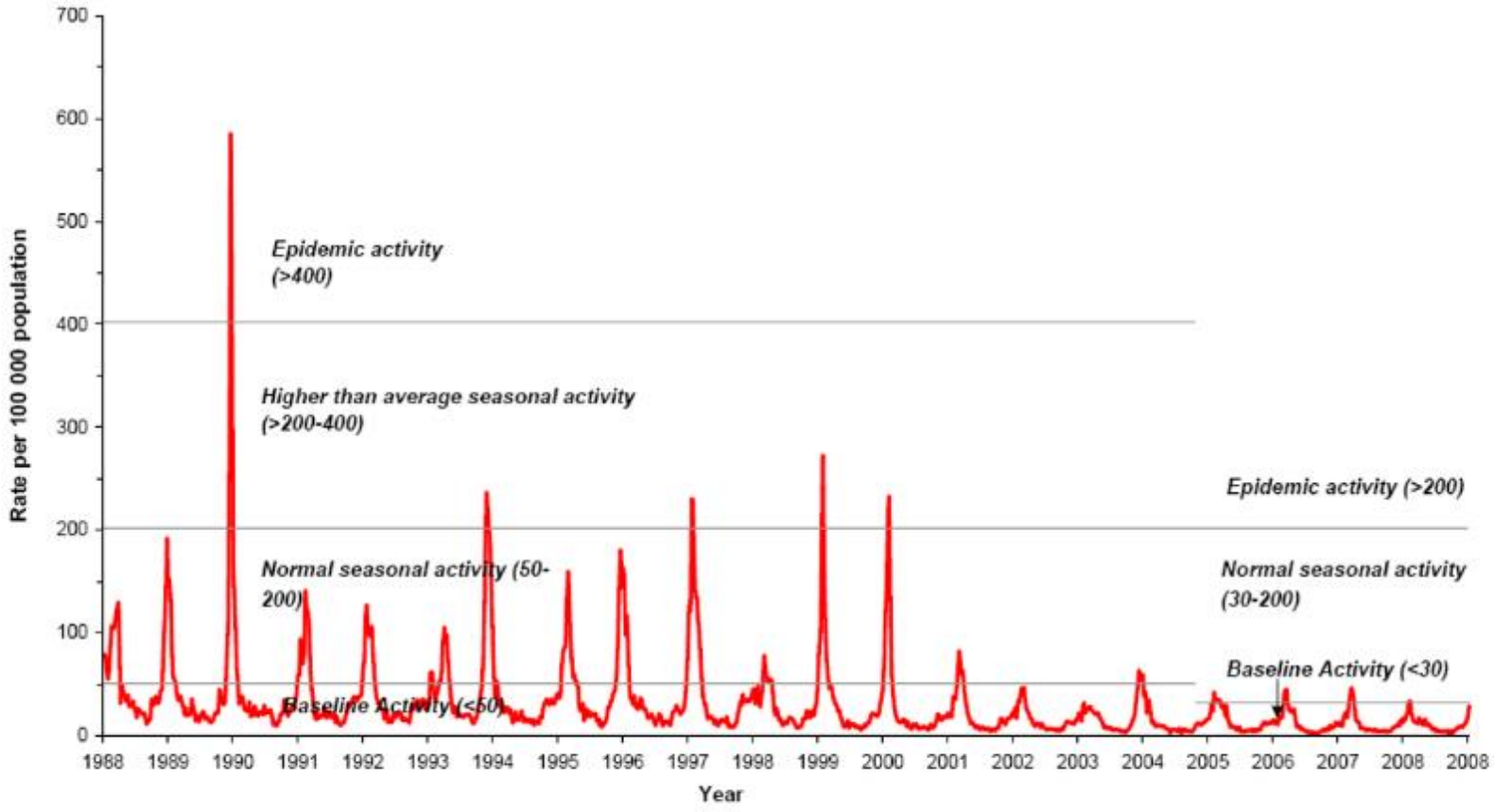
MMR uptake in 10 -16 year olds in West Yorkshire, 2013 (n = 150,000)

Month	No MMR (target <5%)	2 doses of MMR (target >95%)
May	7.4%	86.0%
June	5.9%	87.2%
July	4.8%	88.0%
August	4.5%	88.5%
Sept	4.4%	88.8%

Case study 2: Surveillance of seasonal influenza,

Annual trends, 1988 - 2008

RCGP weekly consultation rate for influenza-like illness (ILI), England, showing revised thresholds for describing levels of influenza activity*.



*Thresholds were revised for the 2004/05 season onwards. There has been a secular decline in GP consultation rates for ILI over recent years. *See CDPH 2003; 6(3): 238-45.*

Primary care consultation rates for influenza-like illness up to week 48, 2008

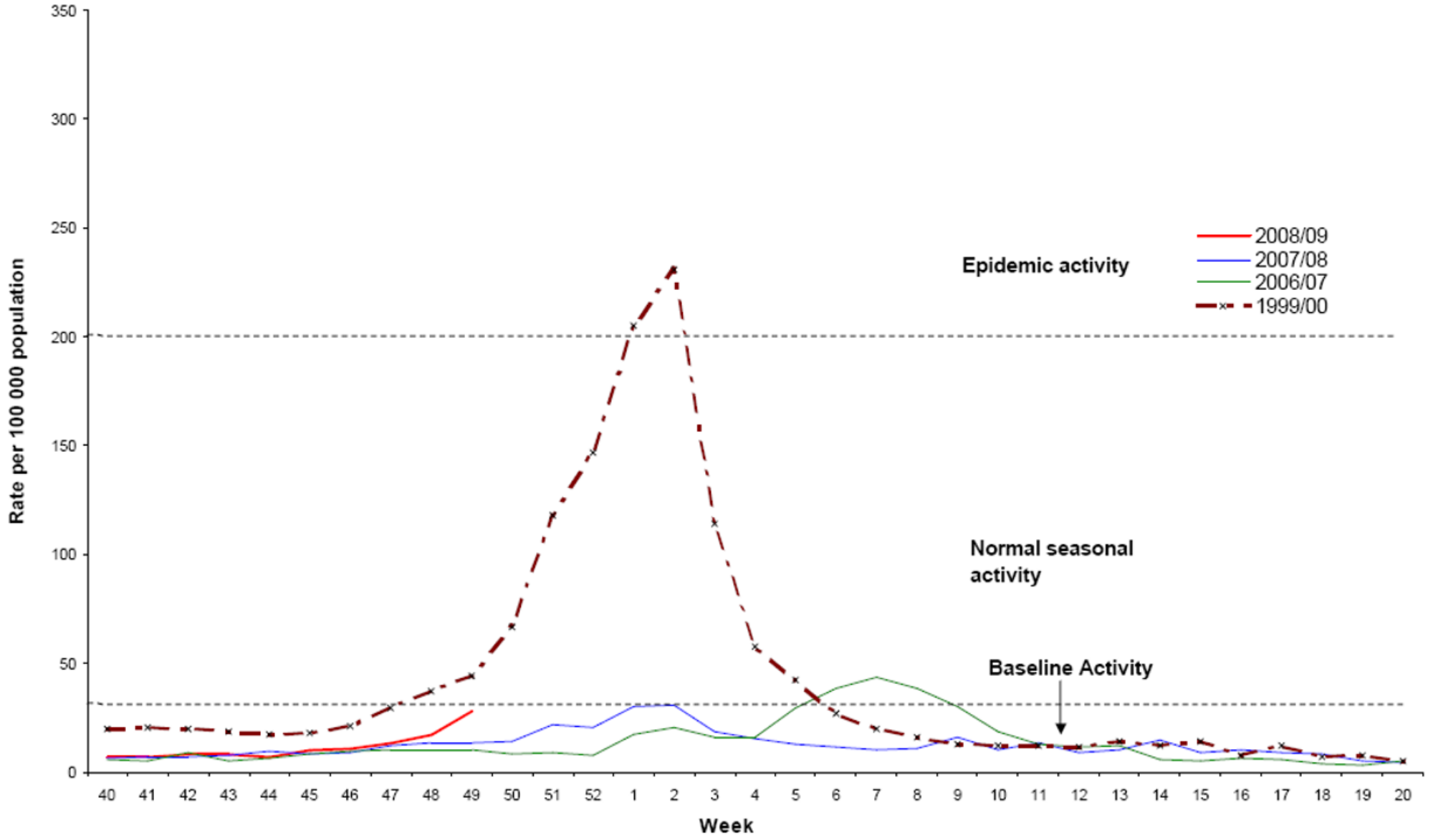
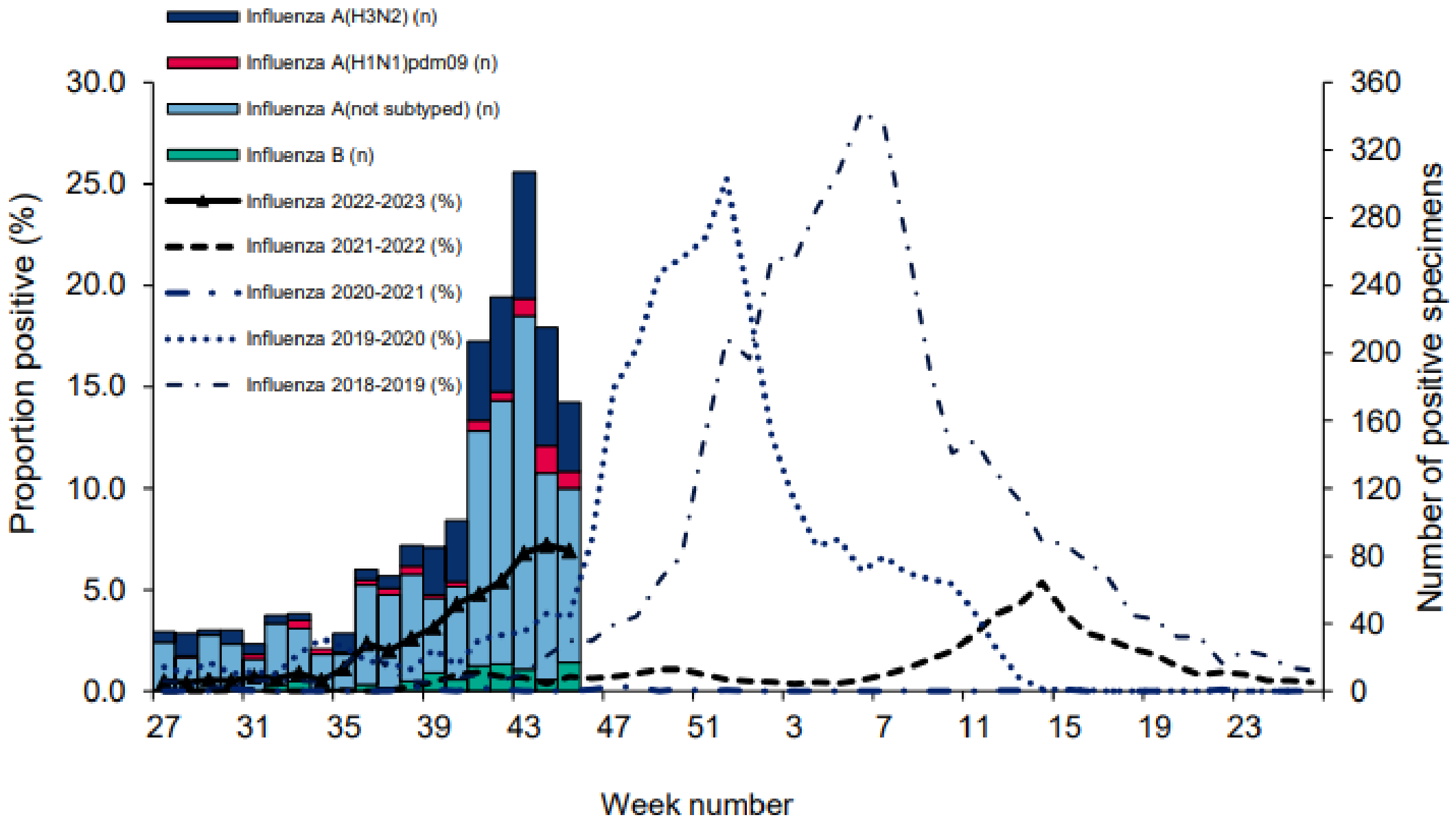


Figure 10: Respiratory DataMart samples positive for influenza and weekly positivity (%) for influenza, England



Department of Health & Social Care

NHS England

From the Chief Medical Officer and Chief Pharmaceutical Officer

CEM/CMO/2022/013

24 November 2022

Influenza season 2022/23: Use of antiviral medicines

UKHSA surveillance data indicates that influenza is circulating in the community.

Prescribers working in primary care may now prescribe, and community pharmacists may now supply antiviral medicines (oseltamivir and zanamivir) for the prophylaxis and treatment of influenza at NHS expense. This is in accordance with NICE guidance, and Schedule 2 to the National Health Service (General Medical Services Contracts (Prescription of drugs etc) Regulations 2004), commonly known as the Grey List or Selected List Scheme (SLS).

Case Study 3: Investigating Cryptosporidium

Intracellular parasite

Commonest non-viral cause of diarrhoea worldwide

Prevalence ~ 1% - 4.5% of population in North America/Europe. (3% - 20% in developing countries)

80% of the population has had cryptosporidiosis.

Peak age of incidence 1-5 years, marked reduction over 35 years.

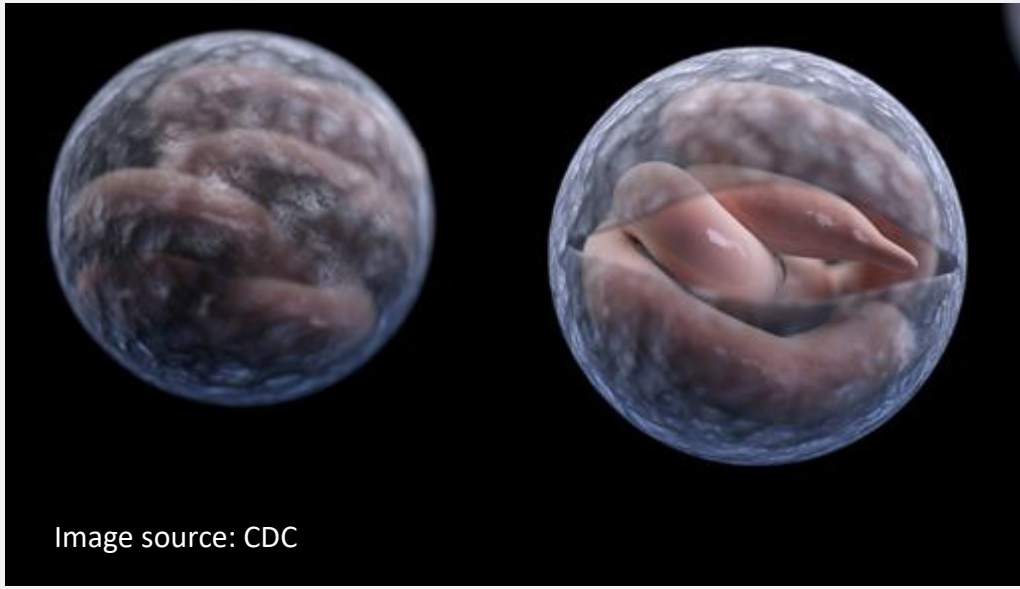


Image source: CDC

Transmission & Risk groups

Faeco-oral transmission

- Person-to-person spread
- Nurseries
- Food handlers
- Animal contact
- MSM

Occupational

- Vets
- Animal handlers
- Farm workers

Image source: Microsoft clipart

Transmission – *continued*

- Common pathogen in lamb and calf diarrhoea.
- Transmitted in surface run-off water contaminated by calf faeces.
- Incidence seasonal and related to rainfall.
- Reservoir for infection: Gastrointestinal tracts of humans and animals
- Manure fertilizers

Image source: Microsoft clipart

Transmission – *continued*

- Waterborne
  - Oocysts are resistant to standard chlorination or many disinfectants.
  - Unboiled tap water
  - Swimming pools

Image source: Microsoft clipart

Clinical manifestation

Self-limiting in most healthy individuals

Low infectious dose

Symptoms:

- watery diarrhoea lasting 2-4 days, abdominal cramps, fever, vomiting, anorexia.

Likelihood of recurrence in cases (auto-infection).

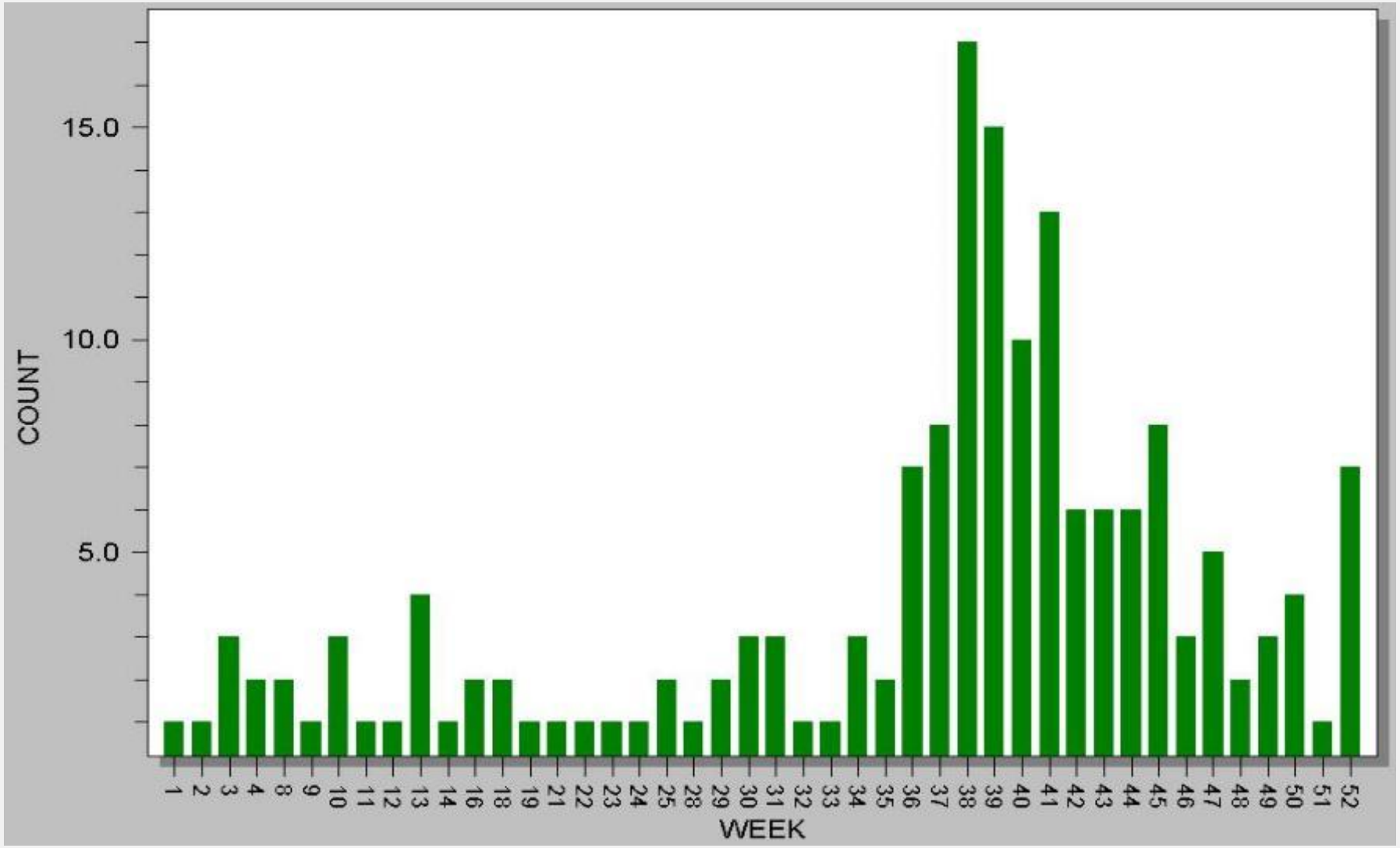
Difficult to treat.

Chronic cryptosporidiosis

- Immunodeficient individuals
- AIDS patients

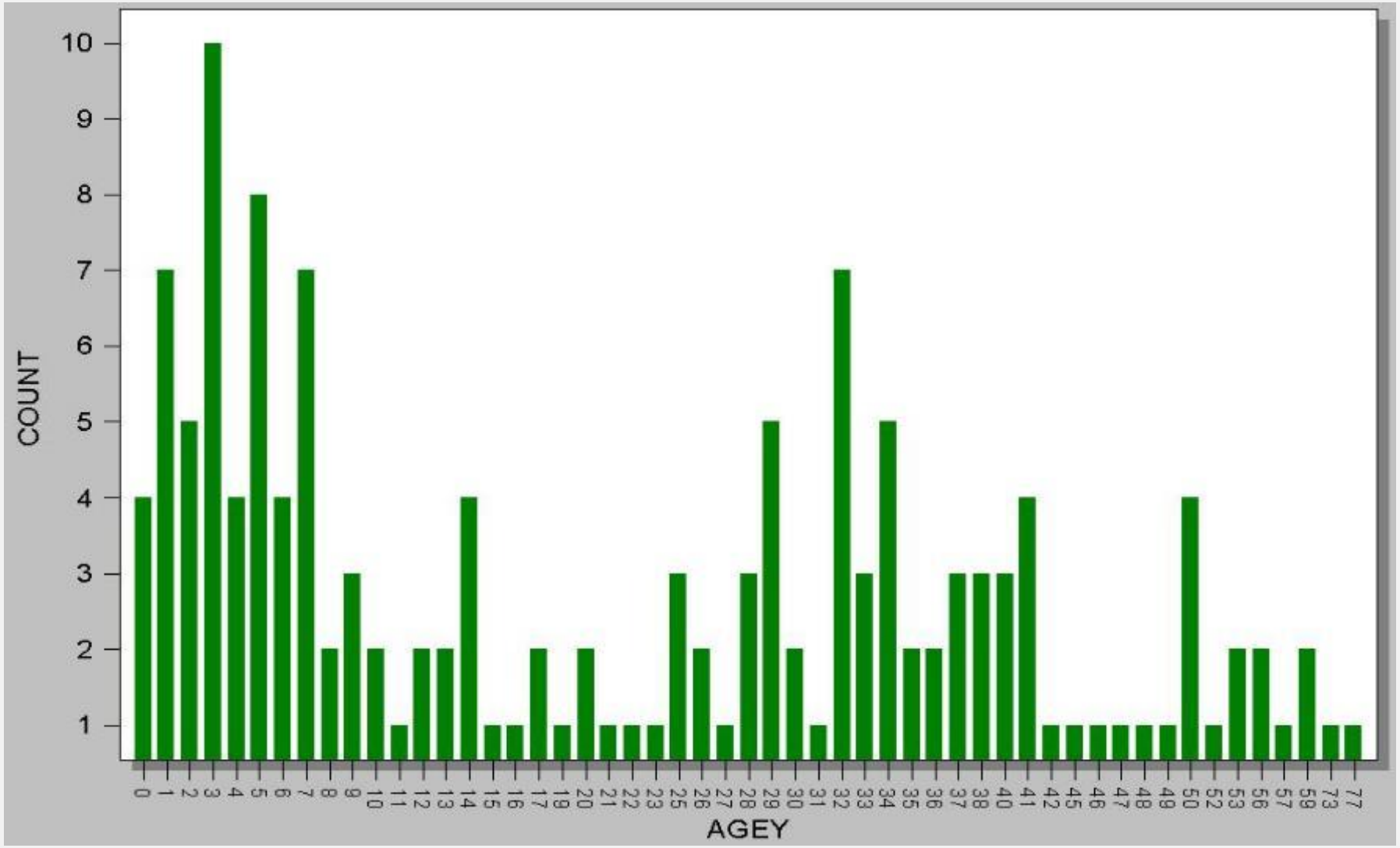
When does it occur?

Figure: Reported cases of cryptosporidium, 2003



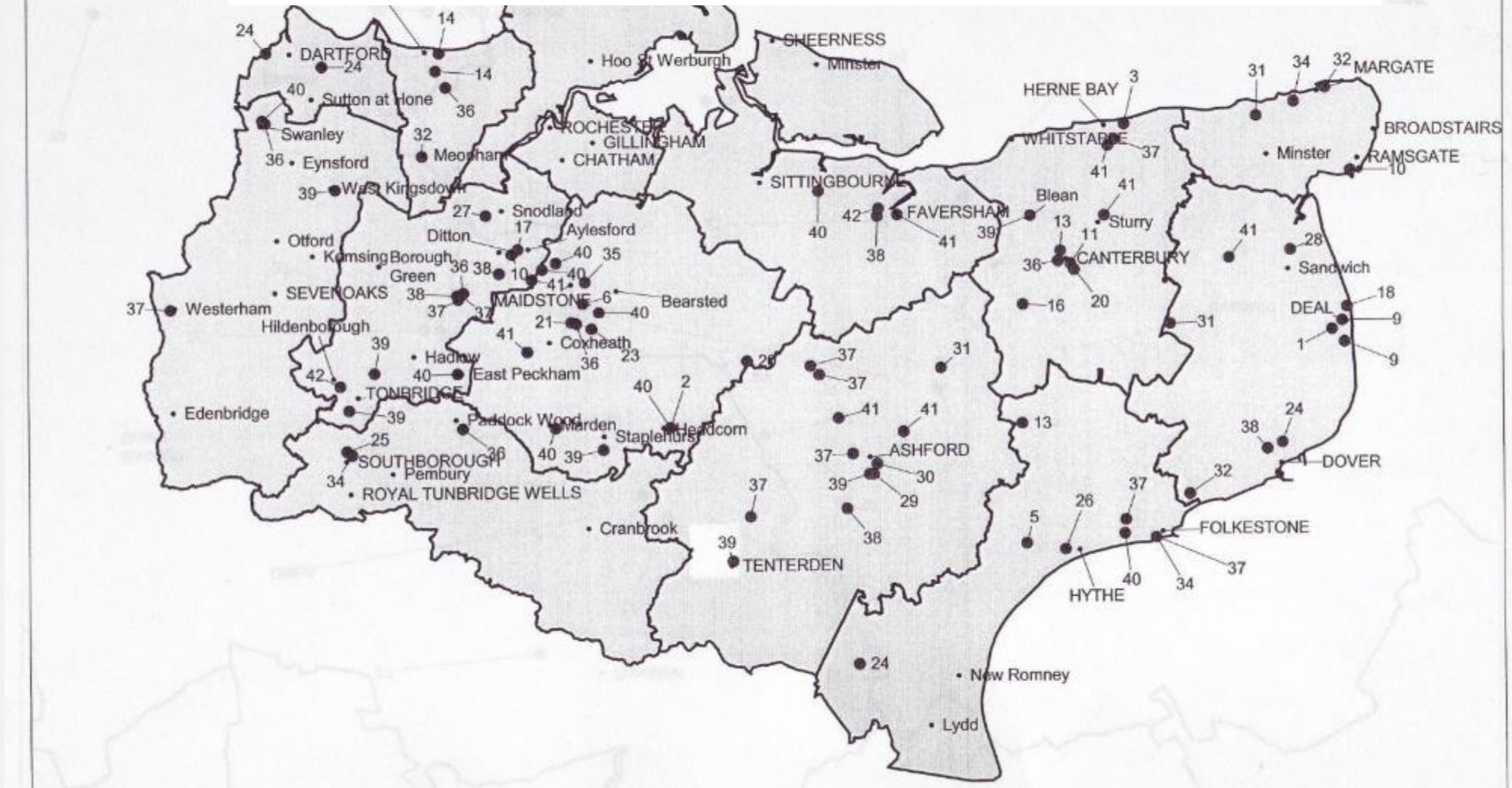
Who gets it?

Figure: Distribution of cases by age



Where does it occur?

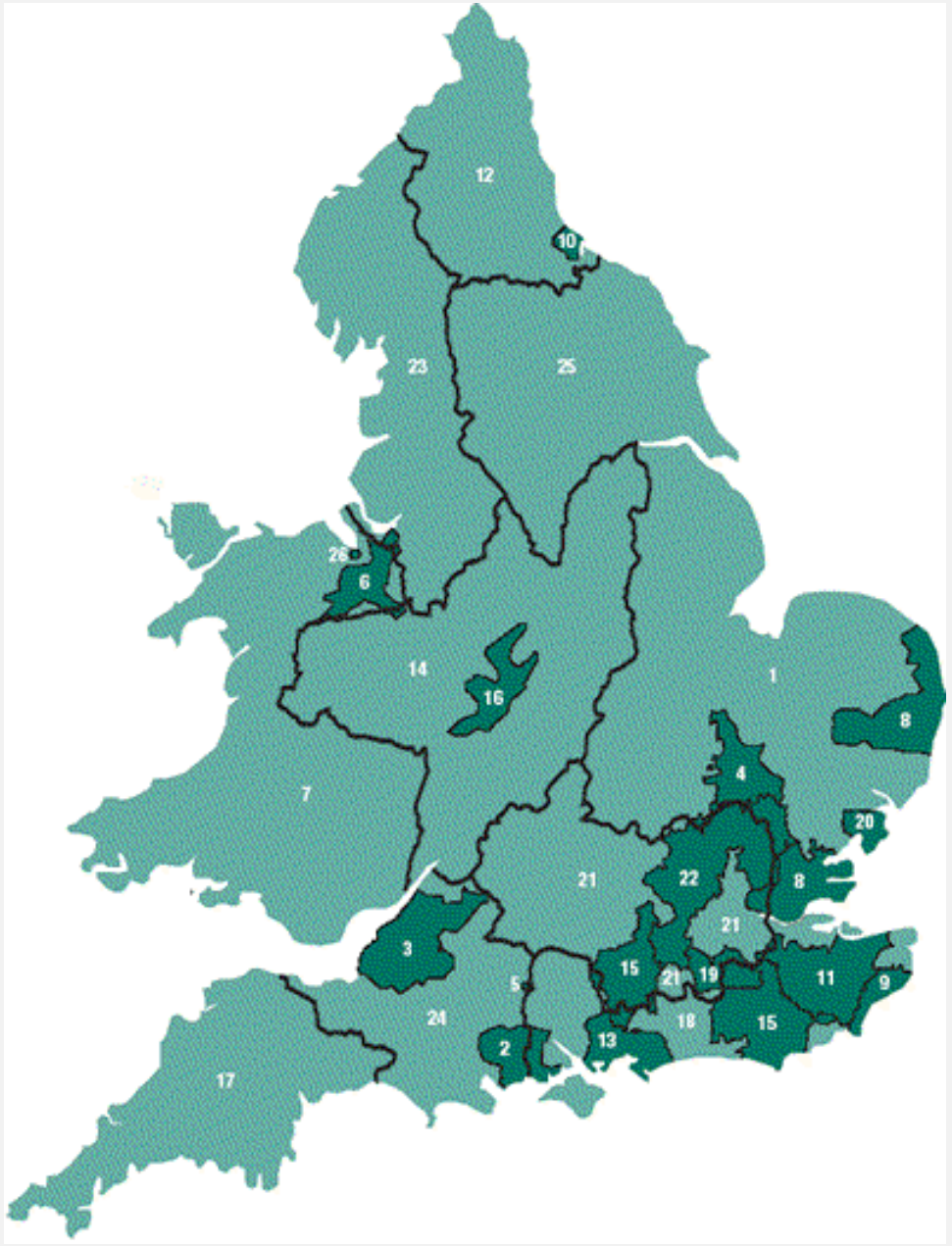
Figure: Distribution of cases of cryptosporidium notified to the Kent Health Protection Unit by week of notification, 2005.




N
Snodland
Burham
Aylesford
Larkfield
Leybourne
East Malling
Ditton
Royal British Legion Village
Sandling
Boxley
Detling
Thurnham
Addington
West Malling
Offham
King's Hill
Oaken Wood
MAIDSTONE
Bearsted
Mote Park
Otham
East Barming
Teston
Wateringbury
Mereworth
Nettlestead
West Farleigh
East Farleigh
Loose
Coxheath
Boughton Monchelsea
Langley
MAIDSTONE DISTRICT
Yalding
Hunton
Chart Sutton

Water supply regions in England and Wales

Image source: Microsoft clipart



International Surveillance

International Surveillance

Morbidity and Mortality Weekly Report, CDC

- *Eurosurveillance* journal

Global networks (e.g GOARN)

Various international collaborations

- European Influenza Surveillance Scheme (EISS)
- European Union Invasive Bacterial Infections Surveillance (EU-IBIS) Network
- Enter-net
- Programme for Monitoring Emerging Diseases (ProMED)

Disease Outbreak News (DONs)

Latest WHO Disease Outbreak News (DONs), providing information on confirmed acute public health events or potential events of concern.

Disease Outbreak News

9 February 2023 | Cholera - Malawi

Disease Outbreak News

8 February 2023 | Meningitis - Niger

Disease Outbreak News

8 February 2023 | Middle East Respiratory Syndrome - Oman

Related emergency content

Situation reports

International Health Regulations

International Health Regulations

First introduced in1969 to prevent spread of

- *cholera, plague, yellow fever, smallpox, relapsing fever & typhus*

WHO Member States are obliged to notify WHO

- Reported in WHO's *Weekly Epidemiological Record*.

Involves:

- Notification of cases
- Health-related rules for international trade and travel.
- Health organization: Measures for de-ratting, dis-infecting, and dis-insecting ships, aircraft, etc.
- Health documents required

Changes to IHR in 2005

1969	→	*2005*
Control of borders	versus	Containment at source
Few diseases	versus	All public health threats
Preset measures	versus	Adapted response
Reactive	versus	Proactive

IH Regulations updated 2005

Role to prevent, protect against, control and provide international response to a

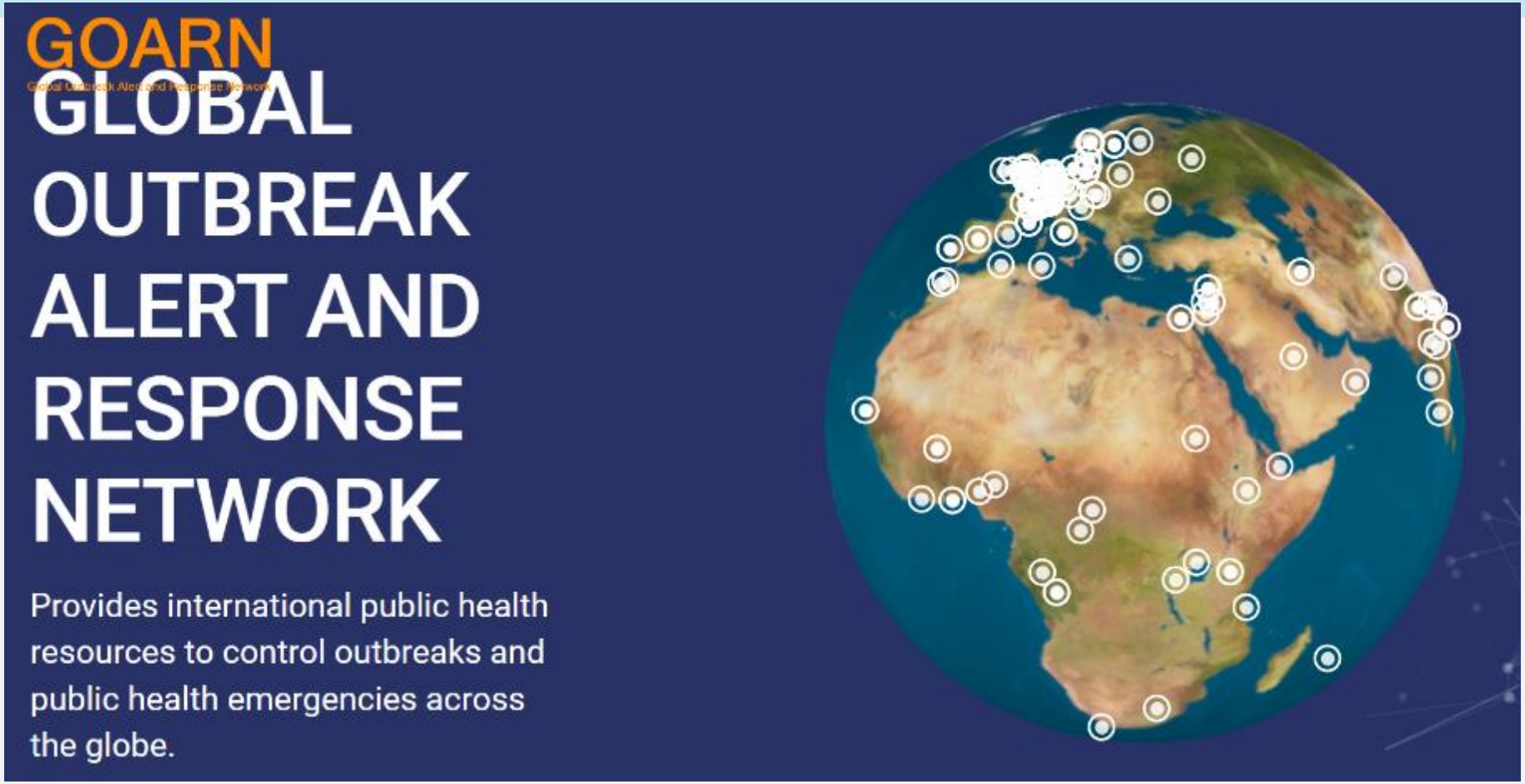
“public health emergency of international concern” (PHEIC)

This is defined as "an extraordinary event which is

- a public health risk to other States through the international spread of disease and
- potentially require a coordinated international response".

Following the pandemic, the IH regulations are being reviewed.

Global Outbreak Alert & Response Network (GOARN)



Technical collaboration

For ***rapid identification***, ***confirmation*** and ***response*** to outbreaks of international importance.

Ensure appropriate *technical assistance* reaches affected states rapidly

Contribute to long-term *epidemic preparedness* and *capacity-building*.

Example of international collaboration in action

World Health Organization

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- Global Outbreak Alert & Response Network
- International Health Regulations
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Epidemic and Pandemic Alert and Response (EPR)

Country activities | Outbreak news | Resources | Media centre

WHO > Programmes and projects > Epidemic and Pandemic Alert and Response (EPR) > Disease Outbreak News

printable version

Unknown disease in South Africa and Zambia

10 October 2008 -- On 12 September, an office employee at a safari tour company living and working in Zambia underwent medical evacuation to South Africa with an as-yet unknown disease. The patient died in a Johannesburg hospital on 14 September.

On 27 September, the paramedic who cared for the index case during her evacuation to South Africa was admitted to hospital in Johannesburg where he died on 2 October. In addition, a nurse who cared for the index case in South Africa died on 5 October in Johannesburg.

Laboratory analysis has been conducted in South Africa at the Special Pathogens Unit, National Institute for Communicable Diseases (NICD) of the National Health Laboratory Service. Samples have, so far, tested negative for a series of viral haemorrhagic fevers and other common infectious disease pathogens. Tests to identify the pathogen continue at the NICD in South Africa and further testing will be performed at the Special Pathogens and Infectious Disease Pathology branches of the Centers for Disease Control and Prevention (CDC), Atlanta, United States. CDC and NICD are technical partners in the Global Outbreak Alert and Response Network (GOARN).

Clinical features common to the three patients initially include fever, headache, diarrhoea and myalgia developing into rash and hepatic dysfunction, followed by rapid deterioration and death. Bleeding was not a marked clinical feature (NICD report (.pdf)).

There are no further known symptomatic cases, either in Zambia or in South Africa. 121 known contacts of the fatal cases are being traced in South Africa and 23 in Zambia.

WHO and its partners are actively supporting the investigation at provincial and national levels. Epidemiologists from the WHO African Regional Office have arrived to assist both countries, and personal protective equipment (PPE) and sampling equipment are en route to Lusaka. WHO is also providing support to the Ministries of Health of the two countries with epidemiological investigations, active case finding and follow-up of contacts.

While the investigations and follow-up of contacts continue, there have been no new cases since the last death on 5 October. There is no indication at this point of the need for any restriction of travel to or from Zambia or South Africa and no special measures are required for passengers arriving from these countries.

WHO African Regional Office is providing updated information to the WHO Country Offices in the neighbouring countries.

INTERNATIONAL HEALTH REGULATIONS STRENGTHENING PROJECT

#IHR_Strengthening

UKaid
Department of Health & Social Care
UK Health Security Agency

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Home

The International Health Regulations Strengthening Project is a UK Aid funded technical assistance project contributing to international efforts to improve global health security through increased compliance with the WHO International Health Regulations (2005).

This dedicated knowledge hub shares learning from the project on preventing, detecting and responding to public health emergencies through our triple mandate of:

1. Strengthening leadership | 2. Building technical capabilities | 3. Developing sustainable public health systems

Welcome

The International Health Regulations (IHR) Strengthening Project launched in 2016 with funding from UK Aid and the UK Department of Health and Social Care to provide expert technical assistance to selected countries and regions to improve their compliance with the ...

LEARN MORE

Tweets from @UKgovGHS

Global Health ...

Glo... · Feb 8

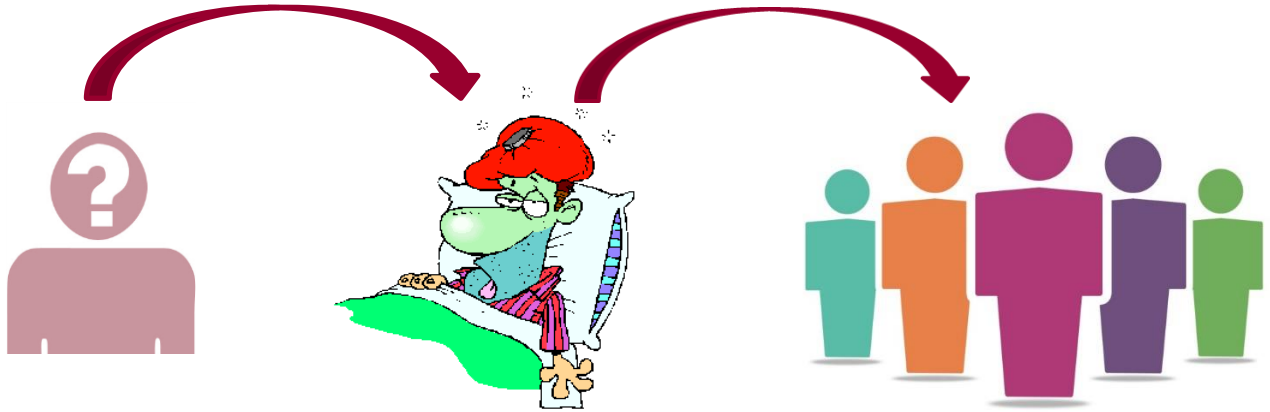
The sixth meeting of

So why is this all useful?

On the basis of available information, the key question that needs to be answered is:

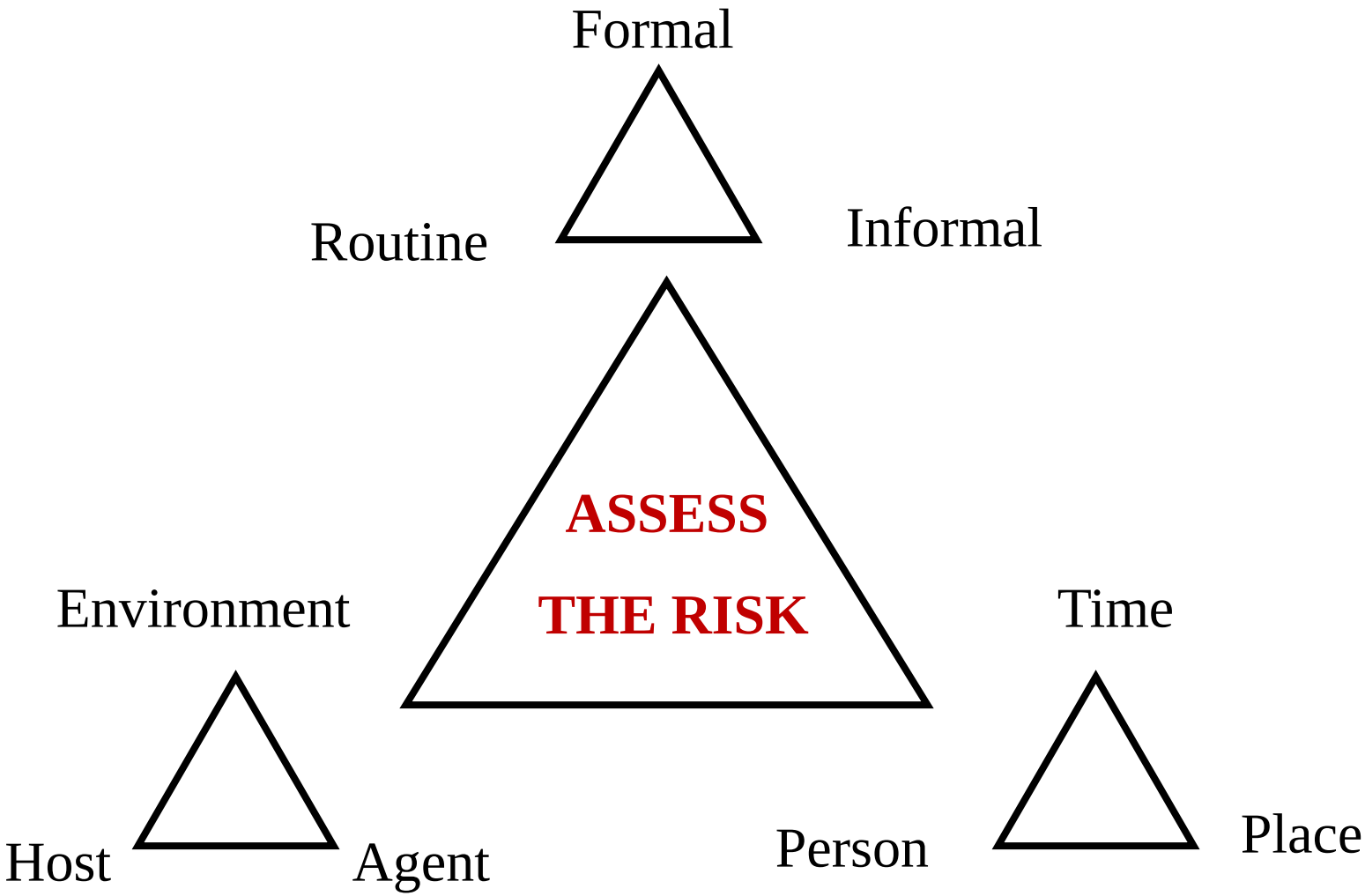
“Is an outbreak happening?”

Where has it come from?
Where is it going?



Source → Pathway → Receptor

IDENTIFY THE PROBLEM



PREVENT & CONTROL

CHARACTERISE THE OUTBREAK

Who's at risk?

Preventing & controlling outbreaks & epidemics

Image source: Lancashire Fire and Rescue Service
https://www.lancsfirerescue.org.uk/moorland-fire-safety/

Summary: How it all fits