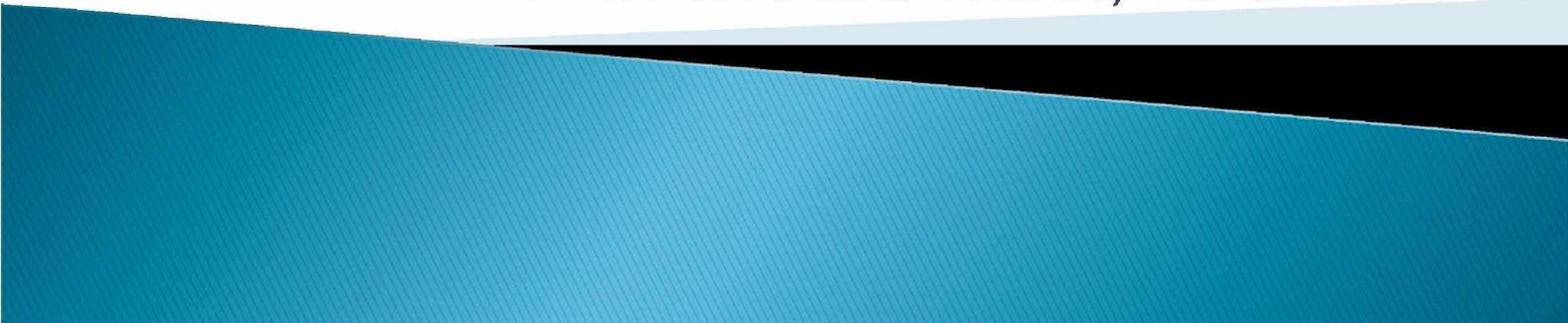


Infectious diseases control masterclass 2020

Prof. dr. 5.1.2e, VU & RIVM



In today's lecture you will learn about:

- ▶ The transmission chain
- ▶ Major crises/outbreaks
- ▶ Role of the WHO
- ▶ Global health issues (reflections)
 - COVID-19



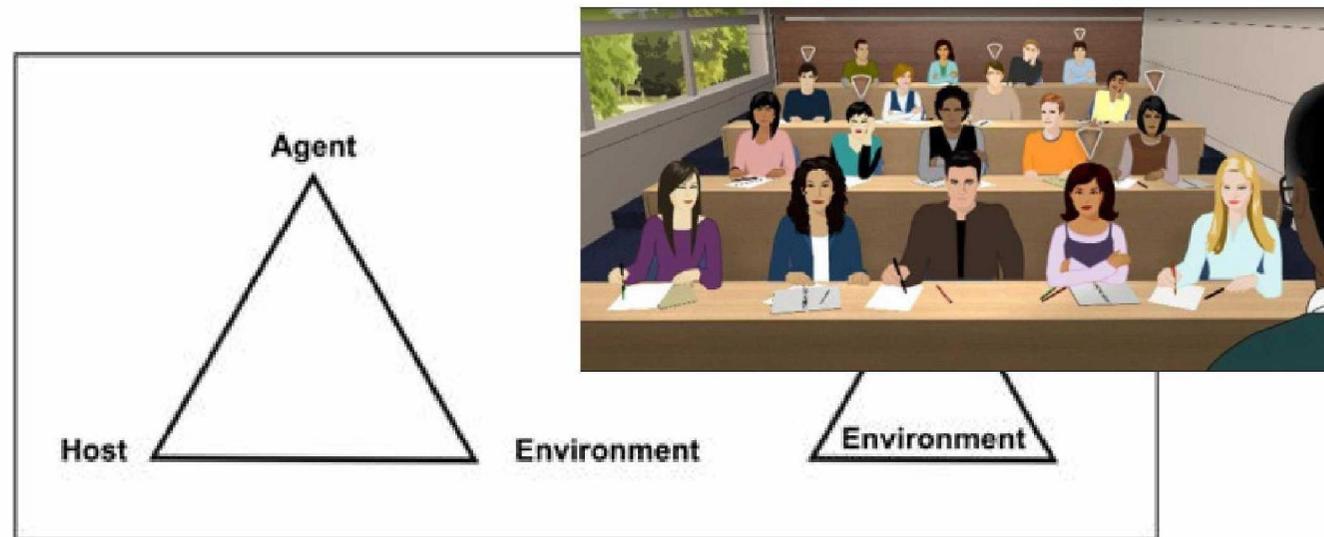
If this person has these symptoms,
what would happen to the other
students the room?



GO TO THE CHATBOX!

Epidemiologic triad (triangle)

model for infectious diseases

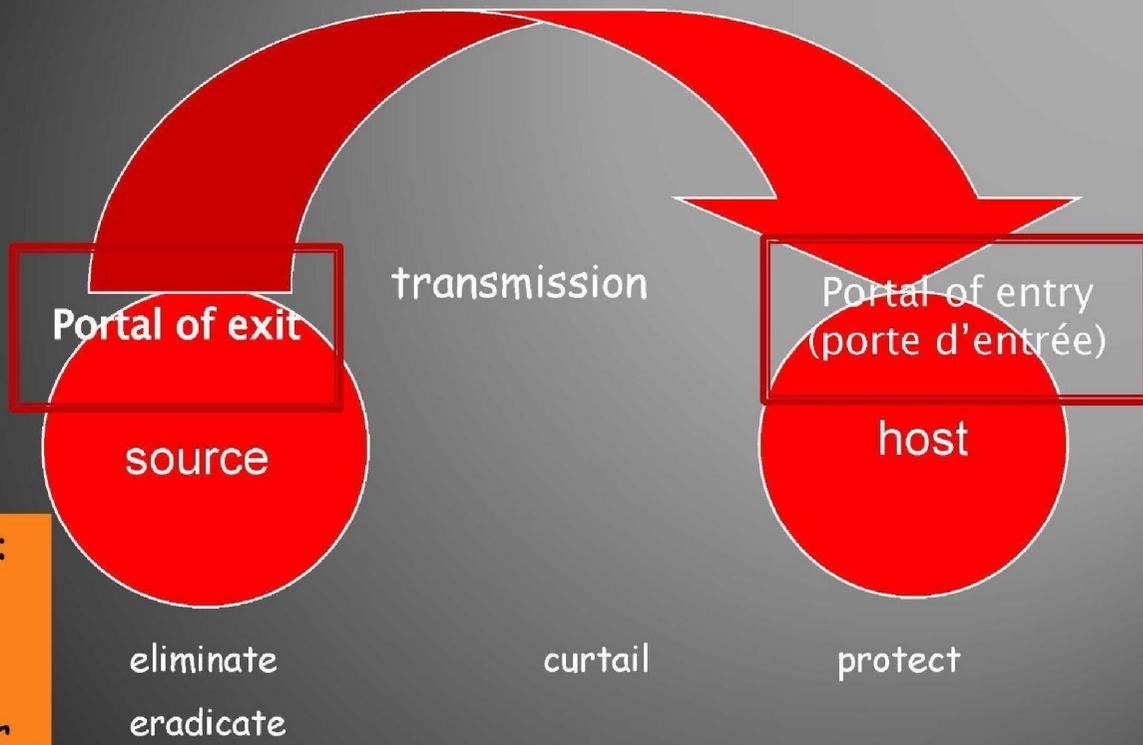


AGENT: microorganisms and their characteristics

HOST: the human who might get infected (risk factors for exposure, susceptibility –vaccination, natural immunity– and response)

ENVIRONMENT: environmental factors, crowding, sanitation, vectors, access to health services

The chain of infection



Reservoir:
Humans,
animals,
soil, water



Which diseases eradicated?
Why? Other candidates?

SUGGESTIONS? Go to the chatbox!



5/8/1980

Smallpox Declared Eradicated

The World Health Assembly accepted the WHO Global Commission's recommendation and declared the world free from smallpox.

Obvious clinical manifestation

Lifelong immunity following natural infection and good vaccine

No animal reservoir



Scroll of the Declaration of Smallpox Eradication.

6-9-2020

7

2011

Rinderpest eradication

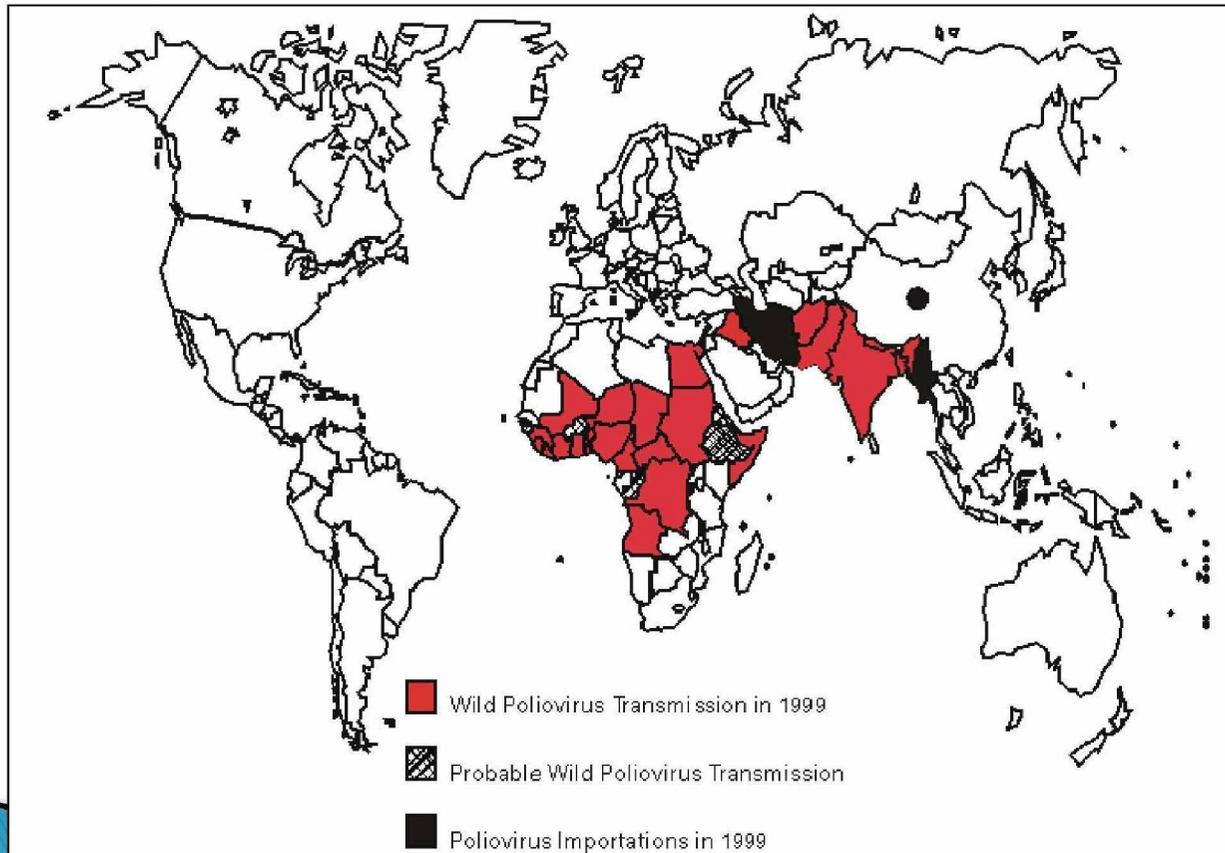


- ▶ 2011 – Global freedom from rinderpest
- ▶ The world was officially declared free from rinderpest in 2011 in the course of the 79th OIE General Session.
- ▶ Rinderpest, once the scourge of societies across Asia, Europe and Africa, is only the second infectious disease, after smallpox for humans, to have been eradicated globally thanks to decades of internationally concerted effort.

Declaration of world-freedom from rinderpest at the 79th OIE General Session (2011)

World Health Assembly (WHA) 1988:
Polio eradication by 2000!

FIGURE 1. Countries with known or probable wild poliovirus transmission — World Health Organization, 1999*



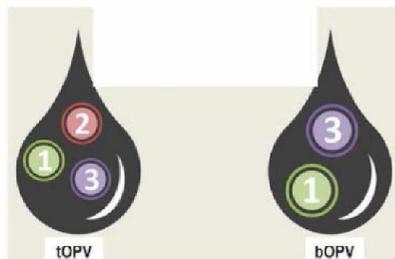
*As of March 13, 2000.

<https://www.cdc.gov/mmwr/preview/mmwrhtml/mm4916a4.htm>

2016

PV2 Eradicated
OPV – Sabin 2 strains can evolve to VDPV

The switch from tOPV to bOPV



Organized in all 155 tOPV-using countries in April 2016



Now: GAPIII phase 2- all PV2 must be contained

WPV3 eradicated 2019

Two out of three wild poliovirus strains eradicated

Global eradication of wild poliovirus type 3 declared on World Polio Day

24 October 2019

In an historic announcement on World Polio Day, an independent commission of experts concluded that wild poliovirus type 3 (WPV3) has been eradicated worldwide. Following the eradication of smallpox and wild poliovirus type 2, this news represents a historic achievement



WHO: Africa is free from wild polio virus

August 2020



Africa has been declared free from wild polio by the independent body, the Africa Regional Certification Commission.

Polio usually affects children under five, sometimes leading to irreversible paralysis. Death can occur when breathing muscles are affected.

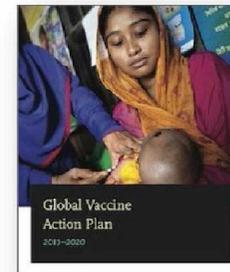
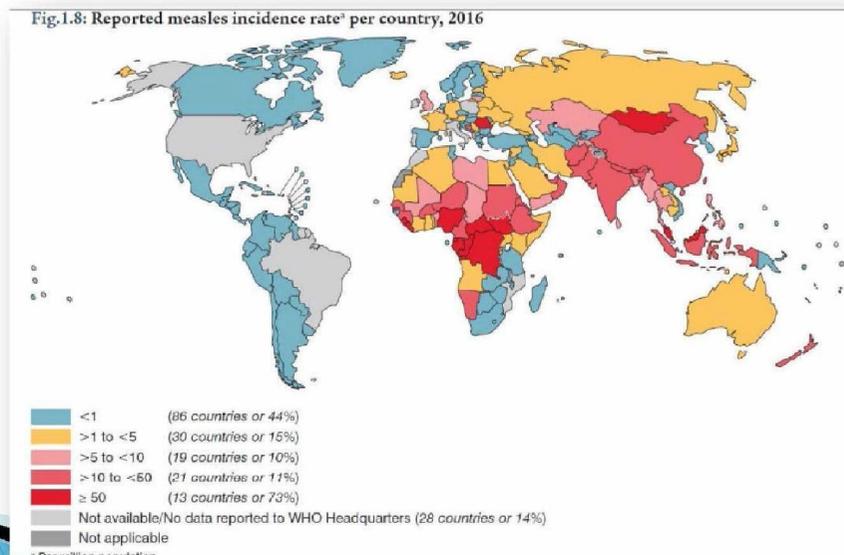
Twenty-five years ago thousands of children in Africa were paralysed by the virus.

The disease is now only found in Afghanistan and Pakistan.

Source: <https://www.bbc.com/news/world-africa-53887947>

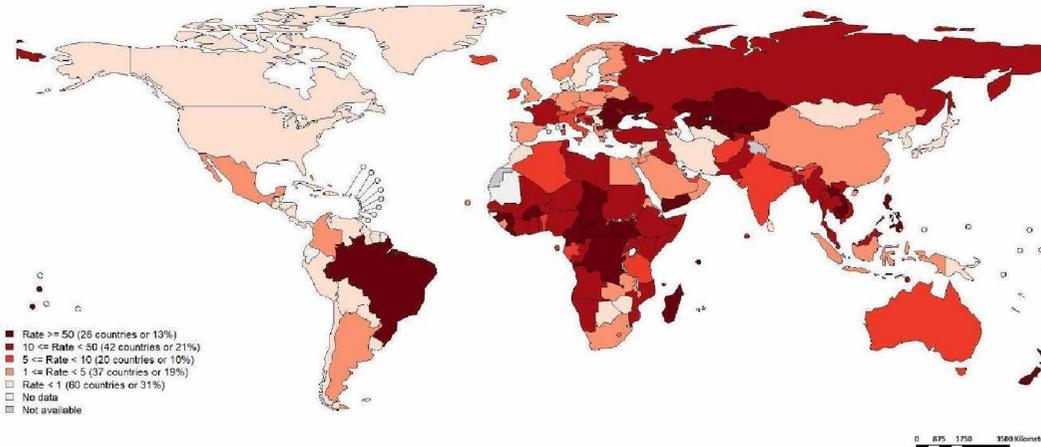
2012 WHA endorses the Global Vaccine Action Plan

- Eliminate measles in four World Health Organization (WHO) regions by 2015 and in five regions by 2020.
- Measles elimination: absence of endemic measles virus transmission in a region or other defined geographic area for ≥ 12 months, in the presence of a high quality surveillance system



Measles Incidence Rate per Million (12M period)

Top 10**		
Country	Cases	Rate
Brazil	29135	137.18
DR Congo	25538	294.46
Philippines	9016	83.4
Nigeria	8294	41.27
India****	7009	5.12
Kazakhstan	6514	350.35
Bangladesh	6473	38.51
Uzbekistan	5201	158.53
Central African Republic	4914	1018.3
Madagascar	3465	128.48



Other countries with high incidence rates***		
Country	Cases	Rate
New Zealand	1910	398.55
Tonga	34	308.98
Seychelles	28	292.57
Samoa	47	236.29
Liberia	793	159.31
Chad	2505	158.4



Map production: World Health Organization, WHO, 2020. All rights reserved.
Data source: IVB Database

Disclaimer: The boundaries and names shown and the designations used on this map 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 borders or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

Measles cases from countries with known discrepancies between case-based and aggregate surveillance, as reported by country				
Country	Year	Cases in Case-based	Cases in Aggregate	Data Source for aggregate #s
DR Congo	2019	18,447	311,408	SitRep RDC No. 47
	2020	15,378	68,626	
Somalia	2019	290	4442	Somali EPI/POL Weekly Update Week 31
	2020	56	1436	

Top 10 based on data reported in 2019-20 and 2020-21. *Other countries with high incidence rates based on data reported in 2019-20 and 2020-21. ****India based on data reported in 2019-20. *****Other countries with high incidence rates based on data reported in 2019-20 and 2020-21. **World population projections, 2019 revision. ** Countries with the highest number of cases for the period - ** Countries with the highest incidence rates (including those already listed in the table above) - ** WHO ID classified suspected measles cases reported in the WHO Weekly Epidemiol. and Health Status Rep. for the week ending 12/12/2020. ** Countries with the highest incidence rates (including those already listed in the table above) - ** WHO ID classified suspected measles cases reported in the WHO Weekly Epidemiol. and Health Status Rep. for the week ending 12/12/2020. ** Countries with the highest number of cases for the period - ** Countries with the highest incidence rates (including those already listed in the table above) - ** WHO ID classified suspected measles cases reported in the WHO Weekly Epidemiol. and Health Status Rep. for the week ending 12/12/2020.

Outbreaks in a historical and global health perspective



In the ancient world

Cholera: already known to Hippocrates (400 BC)

Typhoid fever or plague?: important role during the Peloponnesian war

Leprosy (Hansen's disease): already documented in 1550 BC in Egyptian writings

Smallpox: lesions found in Egyptian mummies

Rabies: known in Babylon

Malaria: described in 5.1.2a ("The Canon of Medicine"), 2700 B.C.E (source CDC)

Pneumonia: described by Hippocrates

Tuberculosis: documented in skeletons 9.000 old found in Israel

Plague: probably circulating in the Bronze age and Iron age

Hence, the need for containment measures...

- ▶ To interrupt further spread of the disease (**control**) by reducing the number of new cases, the number of cases currently infected, and decrease morbidity and mortality associated with the disease
- ▶ To **eliminate** the disease from the population (elimination); reduction of the disease incidence to 0 in a geographical area
- ▶ To achieve the complete and permanent worldwide reduction to zero new cases of the disease through deliberate efforts (**eradication**)



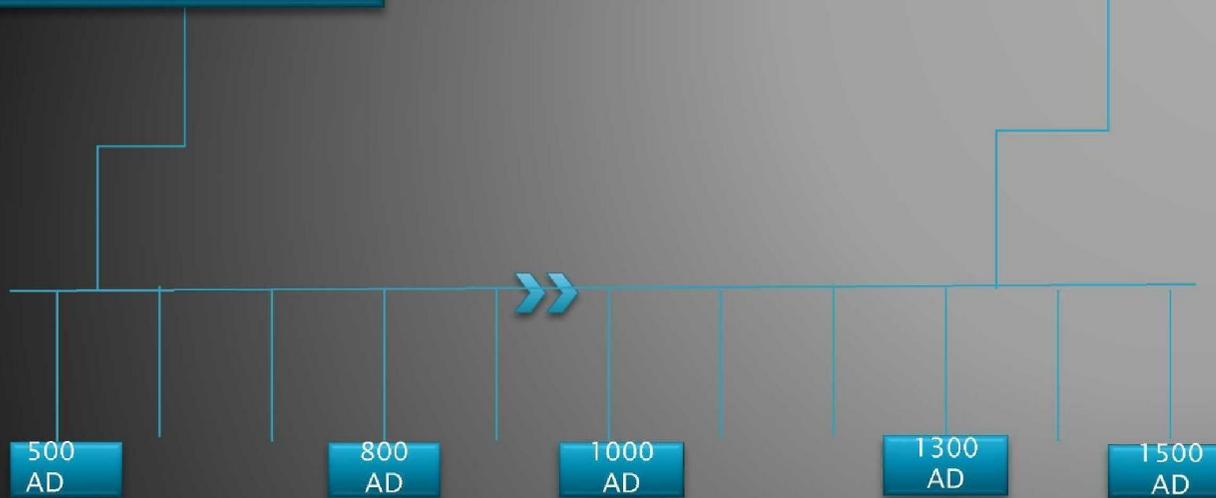
Lessons from plague



Plague of Justinian (531–558)

(China, North Africa,
Middle East, Europe)

Black Death (1346–1553)



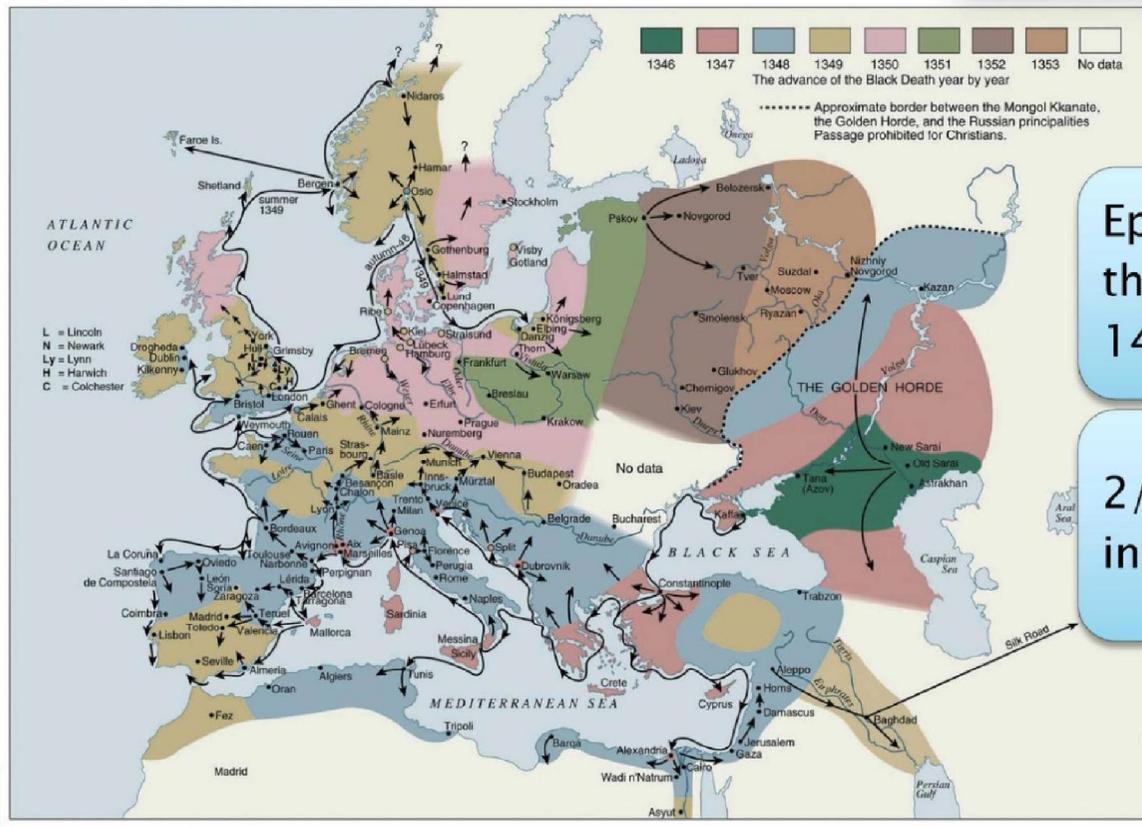
‘The plague depopulated towns, turned the country into desert, and made the habitations of men to become the haunts of wild beasts.’

Warnefried, on the Justinian plague epidemic, about 542–594 A.D.

high impact on mankind: black death

PHIL/ CDC/ Ken Gage

cdc

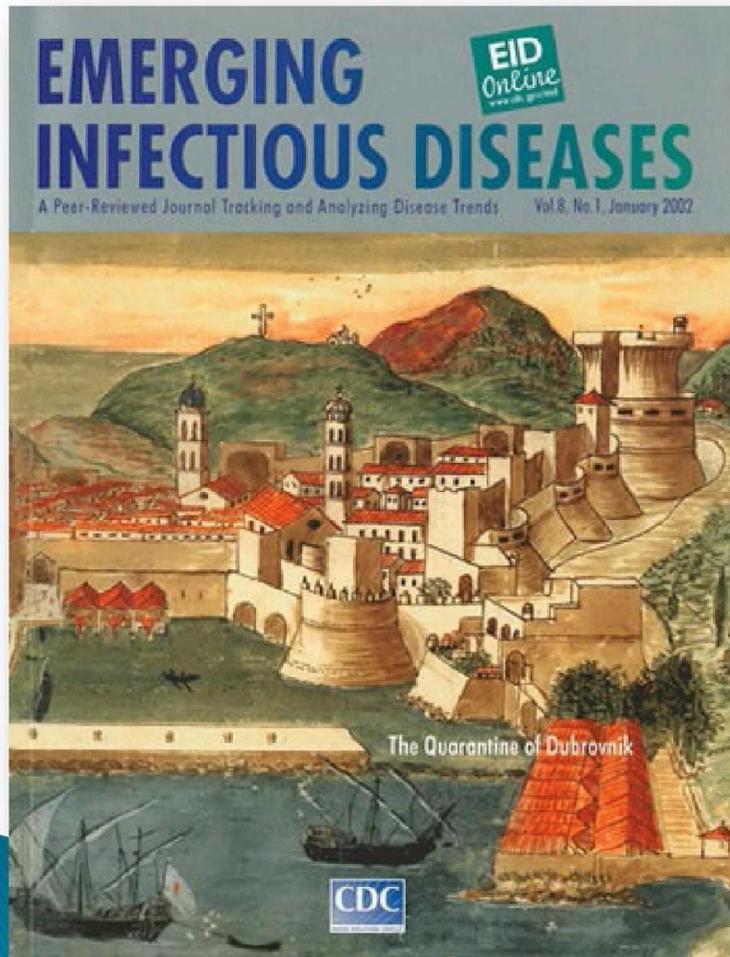


Epidemics of plague in the 6th-8th century and 14th-17th century

2/3 of the population in Europe

Source: Cesana et al, Anthropological Science, 2016

Quarantine



The Old Port of Dubrovnik (watercolor, 18th century). Anonymous. Provided courtesy of Dr. Andreja Tambic-Andrana (CK)

Great plague in London

Isolation, personal protection equipment, social distancing



Wrap-up!



Isolation of the ill

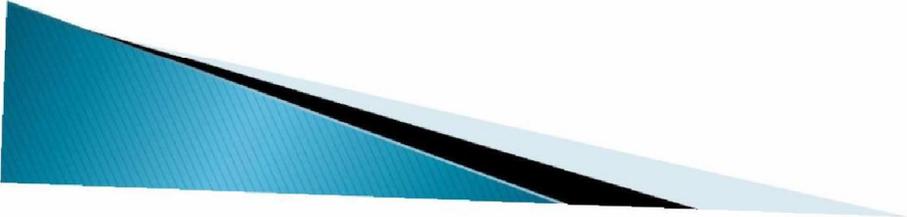
Personal protection equipment

Social distancing

Quarantine of the contacts

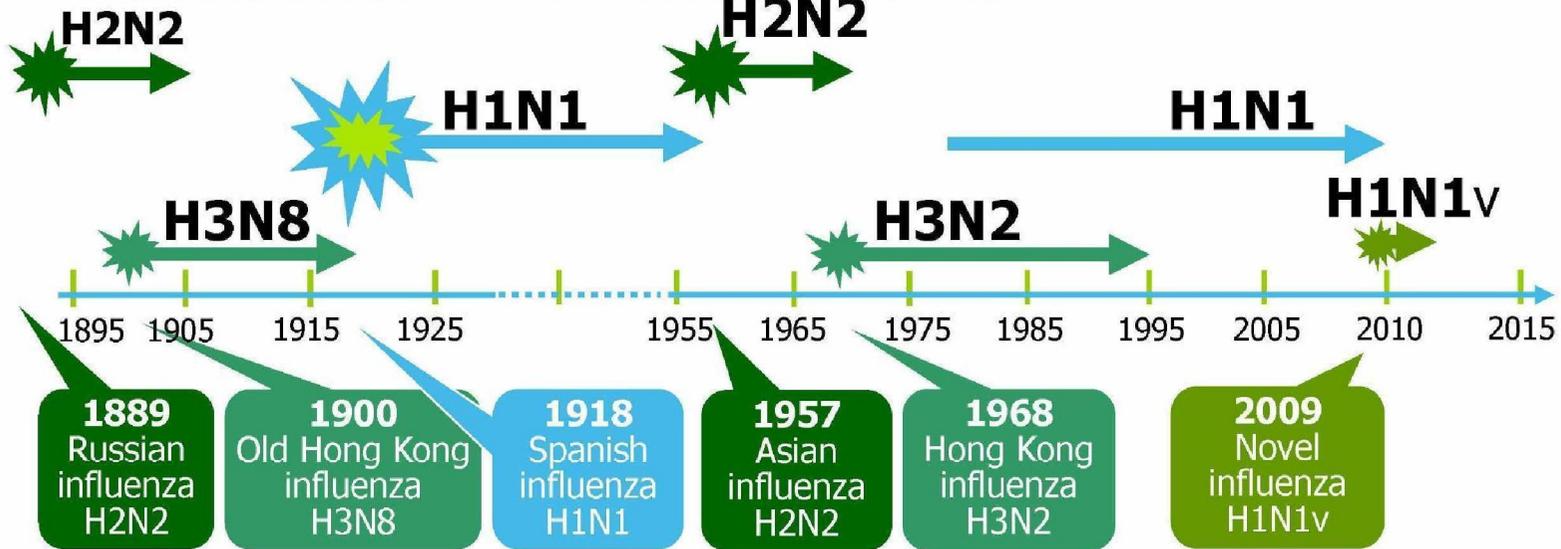
The role of the city administrators

Lessons from the flu pandemic

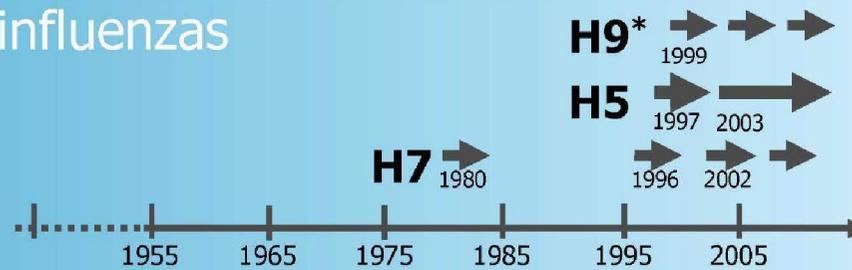




Pandemics of influenza



Recorded new avian influenzas



Reproduced and adapted (2009) with permission from Masato Tashiro, Director, Center for Influenza Virus Research, National Institute of Infectious Diseases (NIID).

Source: ECDC

Influenza pandemics 20–21 century

Communicable Disease Surveillance and Response, WHO



Credit: US National Museum of Health and Medicine

H1N1

H2N2

H3N2

1918: "Spanish flu"

1957: "Asian Flu"

1968: "Hong Kong flu"

20–40 mil. deaths

1–4 mil. deaths

1–4 mil. deaths

H1N1

2009: swine flu (Mexican flu)

200,000–300,000 deaths

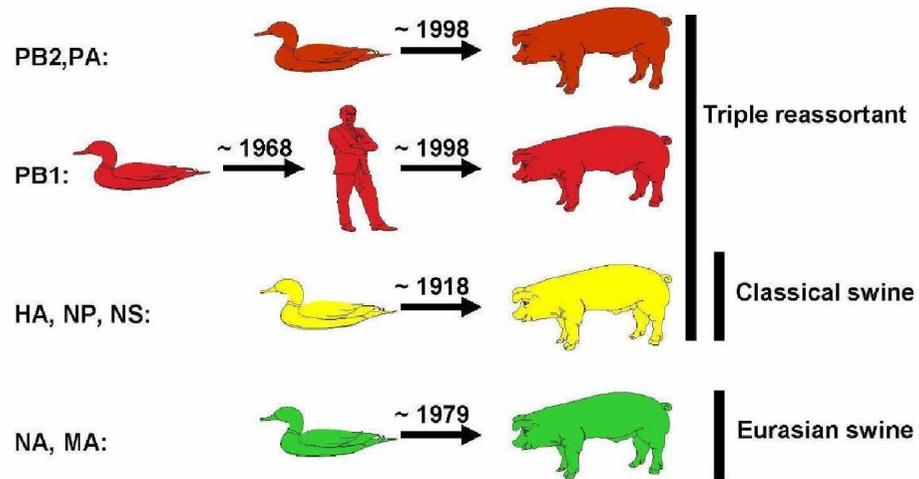


The flu pandemic 2009

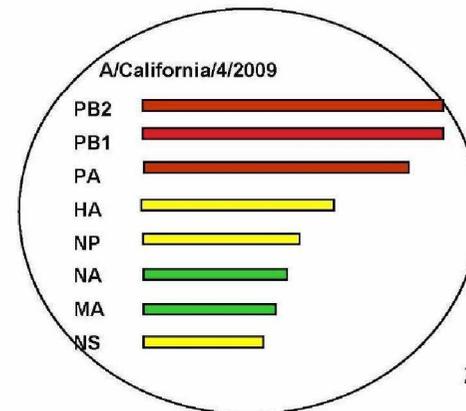
Source: NOS
Journaal



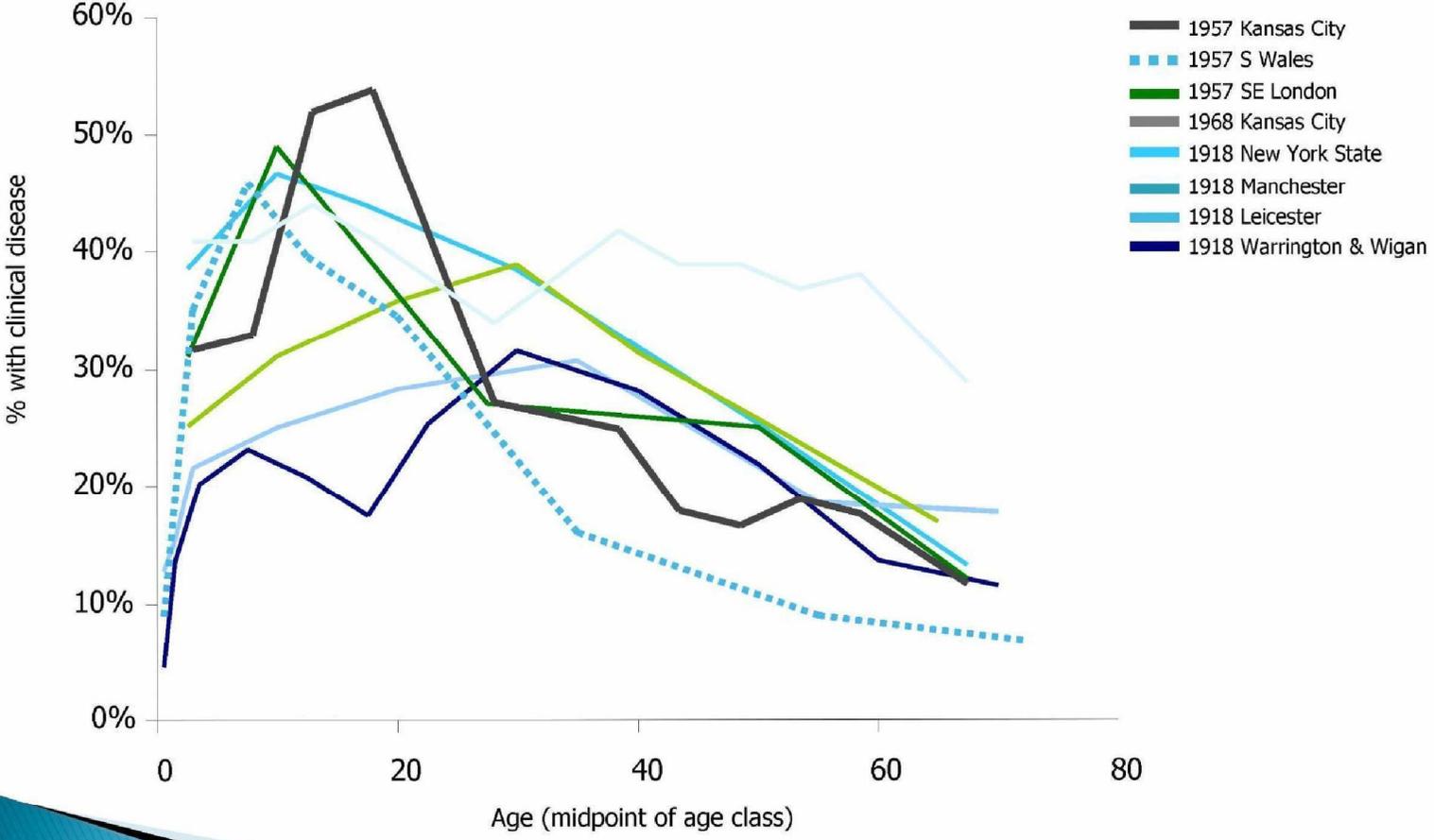
New virus: combination of genes from 4 viruses



Novel Swine-Origin Influenza A (H1N1) Virus Investigation Team*, New England Journal of Medicine, 2009

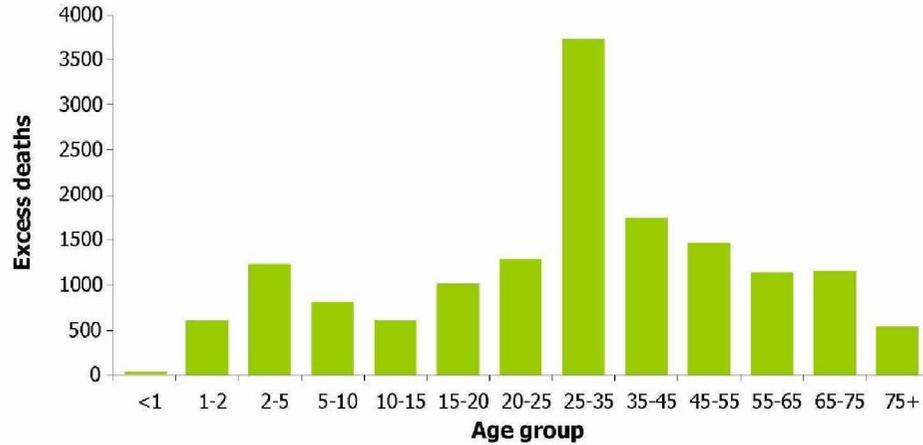


Age-specific clinical attack rate in previous pandemics

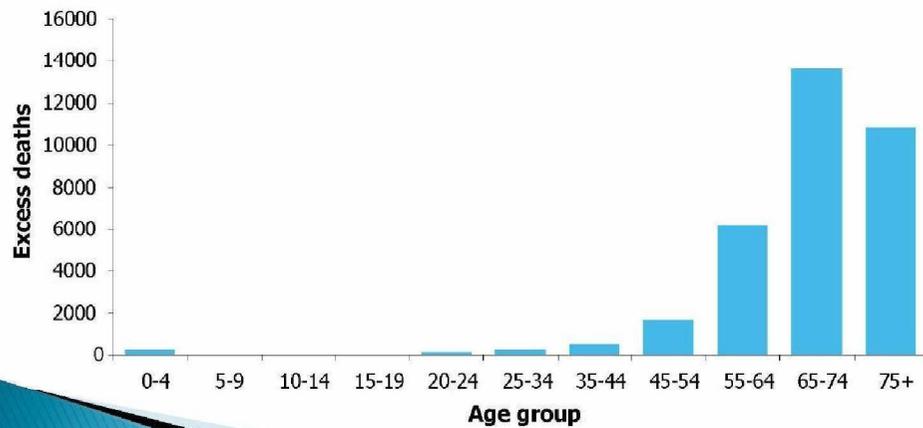


With thanks to Peter Grove, Department of Health, London, UK

Different age-specific excess deaths in pandemics



Excess deaths, second wave, 1918 epidemic

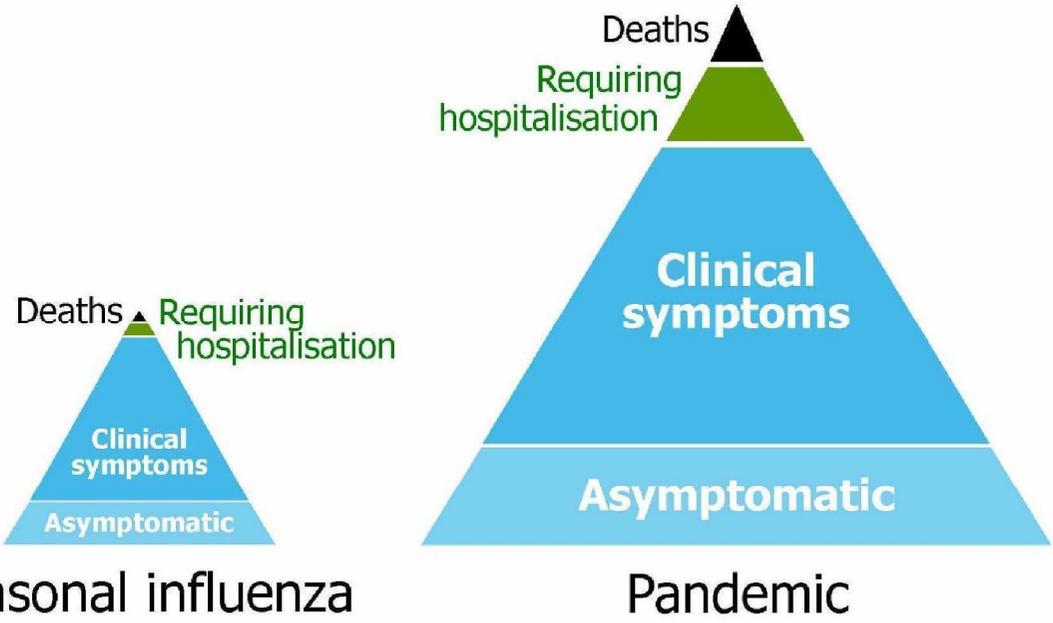


Excess deaths second wave 1969 pandemic, England and Wales

Source: Department of Health, UK

ECDC

Seasonal influenza compared to pandemic — proportions of types of cases



Country, territory and area ▲	New cases since previous update	Cumulative total
5.1.2a	0	
	0	
	0	
	20	
	0	
	0	
	0	
	0	
	0	
{Grand Total}	38	

IMT
 IMT
 IMT
 IMT+1
 IMT
 GMT
 GMT
 GMT

Cumulative	
0	0
38	38

Chinese Taipei has cases of 0 deaths. Cases are included in the table

Trinidad: 3 three confirmed cases of a cruise



[Click here for latest Influenza A\(H1N1\) updates from WHO.](#)

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Country, territory and area ▲	New cases since previous update	Cumulative total
5.1.2a	66	
	0	
	0	
	1163	
	2	
	0	
	0	
	0	
	0	
	0	
{Grand Total}	2112	

- GMT

Cumulative	
4	99
112	15510

Chinese Taipei has cases of 0 deaths. Cases are included in the table.

Jragao: 3 three confirmed cases of a cruise



[Click here for latest Influenza A\(H1N1\) updates from WHO.](#)

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Country, territory and area ▲	New cases since previous update	Cumulative total
5.1.2a	156	
	0	
	0	
	0	
	0	
	0	
	1	
	1	
	0	
	0	
{Grand Total}	1037	

- reports
- GMT

Cumulative	
3	144
37	28774

Chinese Taipei has cases of 0 deaths. Cases are included in the table

Uruguay: 3 three confirmed cases of a cruise



[Click here for latest Influenza A\(H1N1\) updates from WHO.](#)

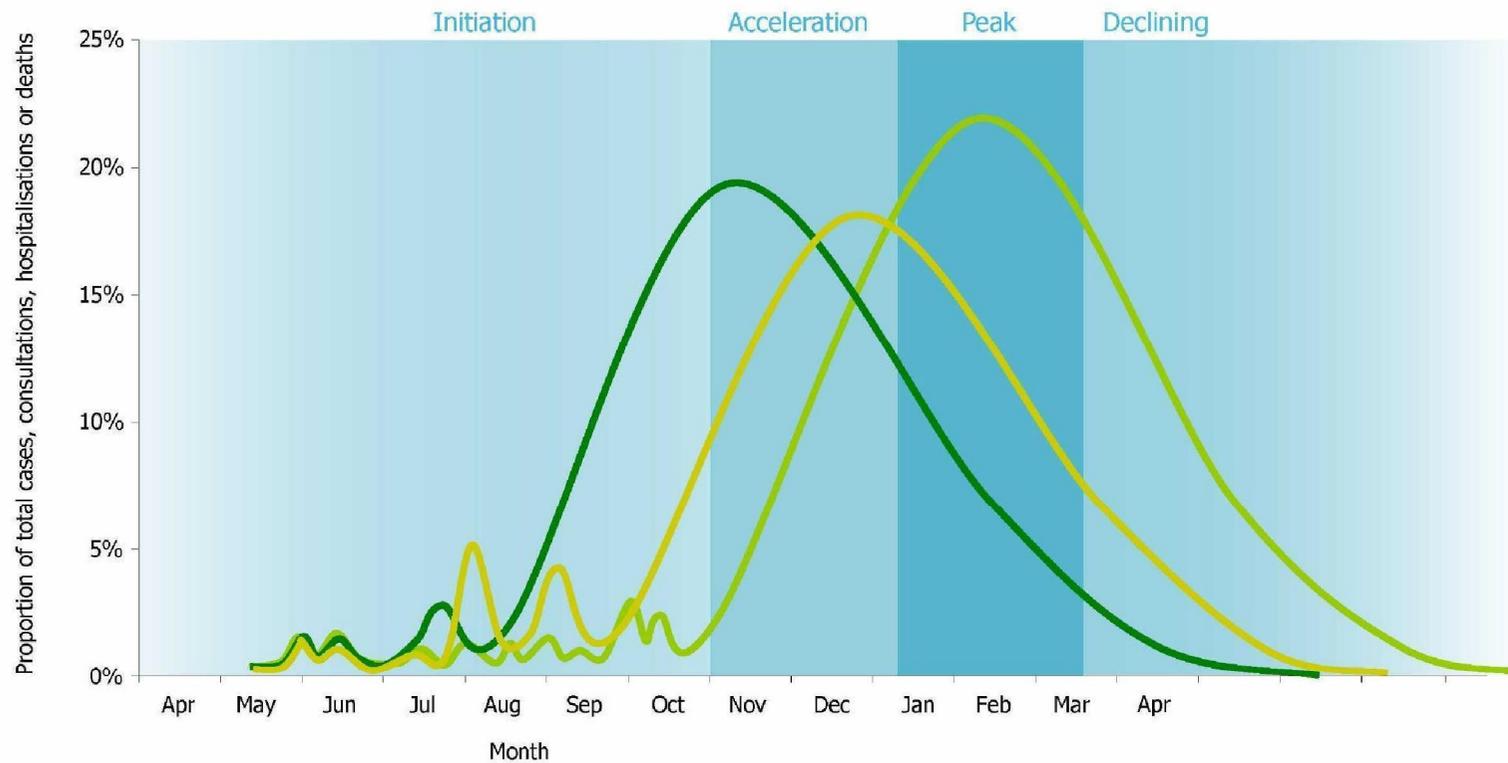
June 11, 2009

- ▶ WHO announces fase 6:
- ▶ World now at the start of 2009
- ▶ influenza pandemic
- ▶ Dr 5.1.2e
Director-General of the World Health Organization

▶



One possible European scenario — summer 2009

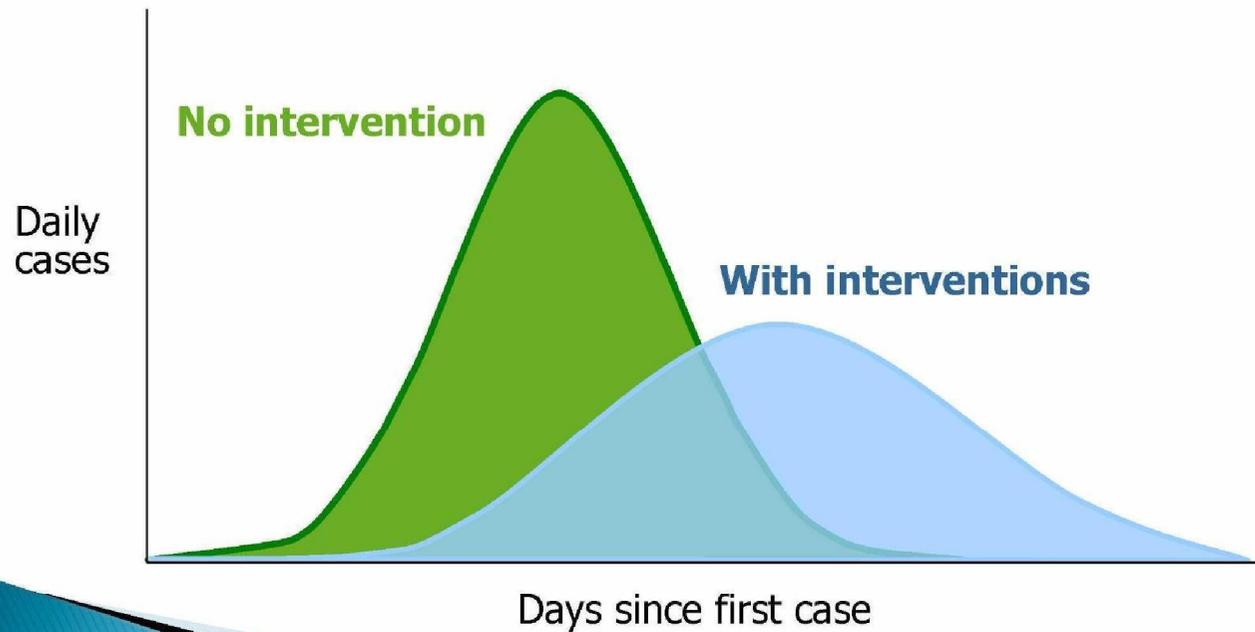


In reality, the initiation phase can be prolonged, especially in the summer months. What cannot be determined is when acceleration takes place.

Bron: ECDC www.ecdc.europa.eu

Aims of community reduction (containment) of influenza transmission — mitigation

- ▶ Delay and flatten epidemic peak
- ▶ Reduce peak burden on healthcare system and threat
- ▶ Somewhat reduce total number of cases
- ▶ Buy a little time



Based on an original graph developed by the US CDC, Atlanta

Source: ECDC, www.ecdc.europa.eu

Which interventions for containment or mitigation?

Social distancing,
cough hygiene

Antivirals

Vaccination with
pandemic vaccine
(adjuvated)

Antivirals: neuraminidase inhibitors

Containment: PHS

- April 28–June 29: treatment of patients and prophylaxis in household contacts (in NL: 126 patients)
- June 30–August 15: treatment of patients (in NL: > 1000 patients)

Mitigation: GP's, hospitals

- August 15 – February 2010: treatment of patients from risk groups or with severe disease

Vaccines in the NL

34 million doses of vaccines were ordered: sufficient for 2 doses for every one

Scepticism whether pandemic vaccination needed ('mild pandemic')

Anxiety about new vaccines not tested thoroughly for safety or effectiveness

Confusion about 2 versus 1 doses, in particular after WHO statements

Discussions about role of pharmaceutical lobby in scientific advisory committees



Outbreaks in schools or public health events?

School outbreaks

- Hygienic measures
- No school closure advised

Public events

- Hygienic measures;
 - → involve the PHS
- No cancellation of public event advised

Pandemic vaccine coverage

Medical risk groups (GP): 76% (93%, 2 doses)

Health care workers: 50% (87%, 2 doses)

Healthy children: 74% (81%, 2 doses)

Care providers infants: 64% (80%, 2 doses)

Estimated >5 million people vaccinated (30% population)

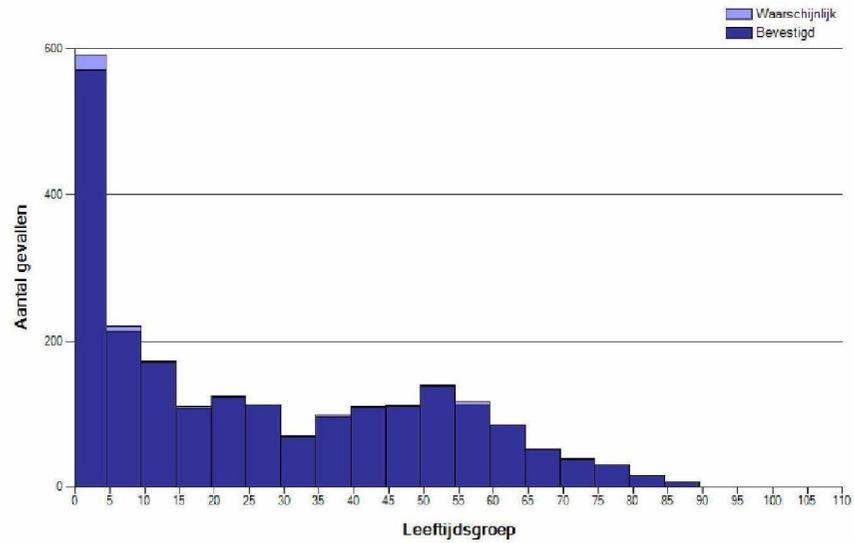


Influenza A (H1N1) 2009 pandemic in the Netherlands

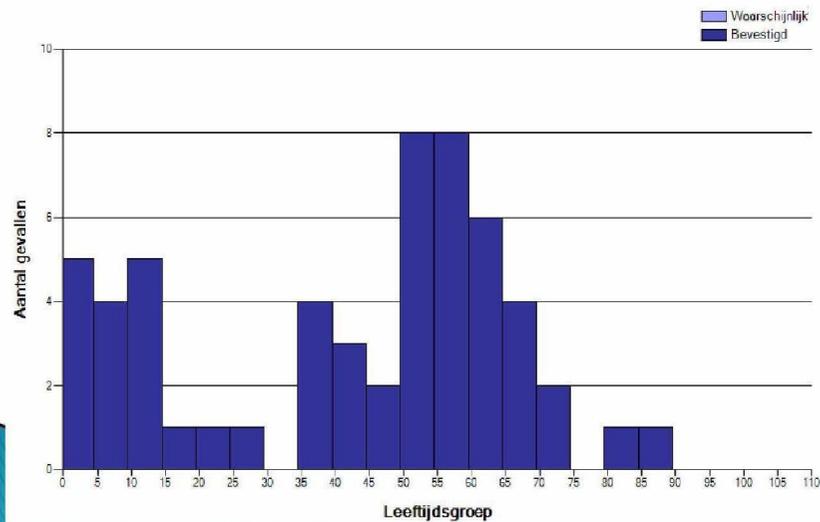
2193 patients
admitted to
hospital (50% with
co-morbidity)

63 notified deaths
(90% with co-
morbidity)

Source:
RIVM



Age distribution of the patients admitted in hospitals during the H1N1 pandemic in the Netherlands



Age distribution of patients who died of A/H1N1, in the Netherlands

Source: RIVM,

Influenza A (H1N1) 2009 pandemic worldwide
by August 2010

18.500 laboratory-confirmed deaths
from pandemic influenza A (H1N1)

201 200, estimated number of deaths
due respiratory disease, associated with
the pandemic

83 300 due to cardiovascular disease.

Estimates of mortality **0.001-0.007%**
compared to **0.03%** of the world's
population during the 1968 pandemic
and to **1-3%** of the world's population
during the 1918 pandemic.

Sources:
WHO, update 112,
Dawood & Iuliano 2012, CDC

Wrap-up!



The role of contact tracing in early stages

The role of antivirals

Social distancing

The role of vaccines

The role of joint human/animal surveillance systems



HIV and AIDS

In USA 3064/+1292

In USA 7699/+3665
Europe 766

Worldwide 20303

5 cases of PCP in NY in gay men

Cases of Kaposi sarcoma in gay

Cases of PCP in IVDU

270 cases of severe immunodeficiency in gay men, 121 died

CDC introduces the term AIDS

originating in DRC

Blood test

HIV as official name

1920

1981, 1982

1983

1984

1985

1987

Needle & syringe programs

First anti-retroviral drug!

Transmission routes known 89-2000

“control measures: **ART**, health education, safe sex, safe blood/blood products, safe needles

HIV 2018, according to WHO

HIV/AIDS one of the world's most significant public health challenges, particularly in low- and middle-income countries.

antiretroviral therapy (ART) allows HIV-positive people to live longer and healthier.

ART prevents onward transmission of HIV.

21.7 million people received HIV treatment in 2017 (59% of the 36.9 million people with HIV).

In 2017, 8 out of 10 pregnant women with HIV (1.1 million women), received ART

Lessons from Ebola

“Everybody knows that pestilences have a way of recurring in the world; yet somehow we find it hard to believe in ones that crash down on our heads from a blue sky. There have been as many plagues as wars in history; yet always plagues and wars take people equally by surprise.”

A. Camus. The Plague

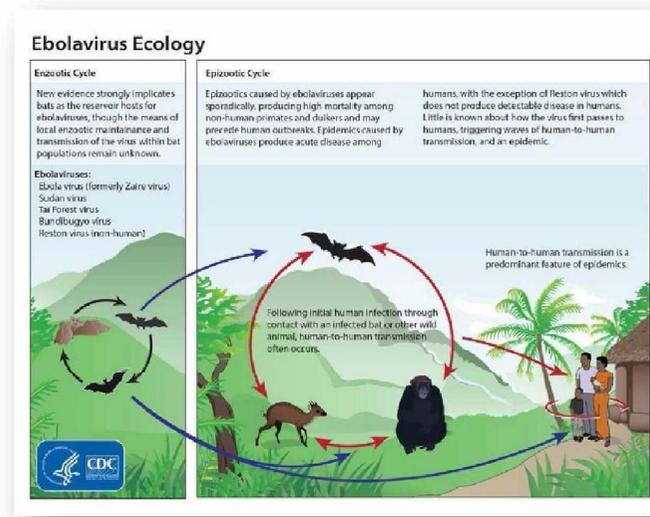


Ebola

▶ Symptoms: 2–21 post-exposure (8–10)

- Fever
- Headache
- Myalgia
- Malaise
- Fatigue
- Diarrhoea
- Vomiting
- Abdominal pain
- Bleeding

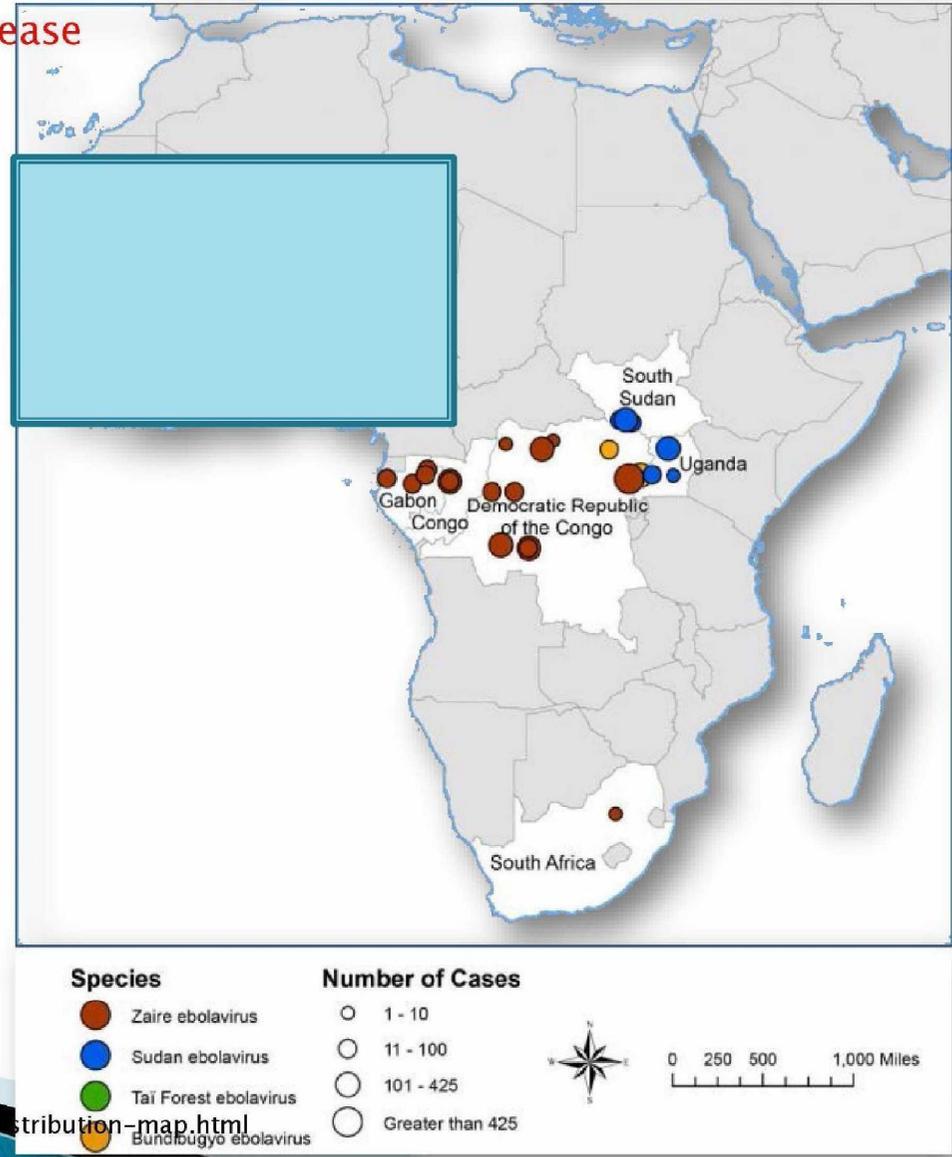
- 20–30% bleeding
- 50% shock, multiple organ failure



bron: CDC (www.cdc.gov)

- direct contact (damaged skin or mucosa) with blood or bodily fluids
- Contaminated needles
- Consumption of bushmeat
- $R_0 = 1,5$

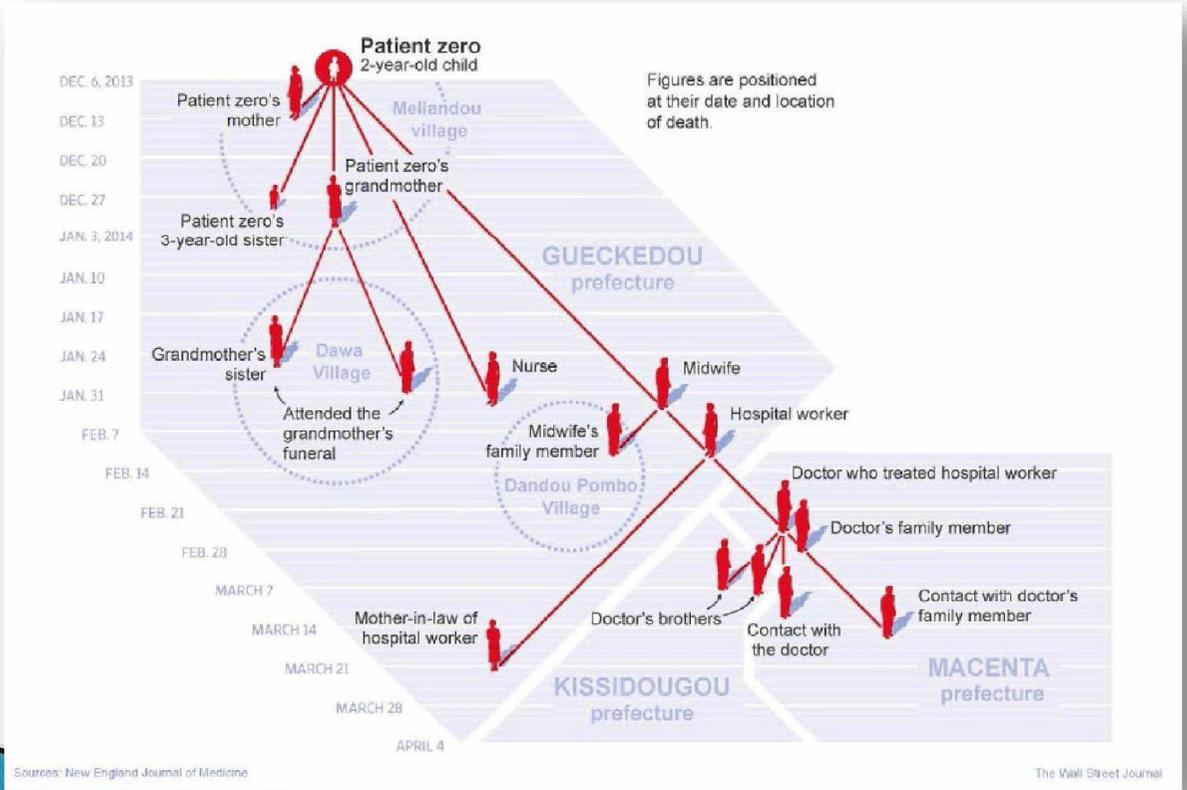
Cases of Ebola Virus Disease in Africa Since 1976



Source: CDC

<https://www.cdc.gov/vhf/ebola/history/distribution-map.html>

Ebola index case— dec 2013



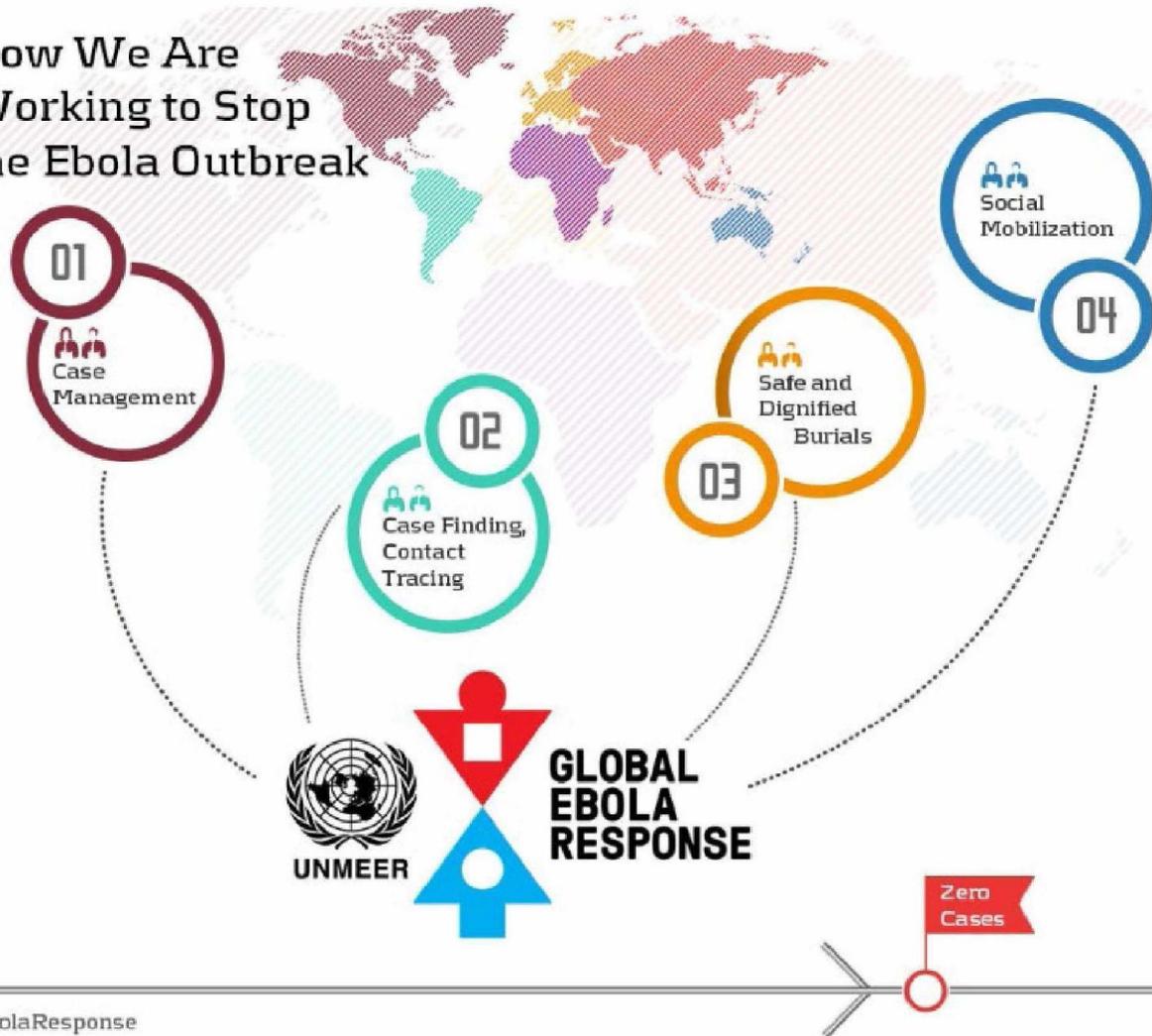
Sources: NEJM, The Wall Street Journal

Acknowledgements: J van Dissel

- 8 August 2014, WHO: Ebola is a “Public Health Emergency of International Concern’ (PHEIC)
- 28 August 2014, WHO Ebola response roadmap
 - To stop Ebola transmission in affected countries within 6–9 months and prevent international spread
- **19 september 2014: UNMEER (United Nations Mission for Ebola Emergency Response)**

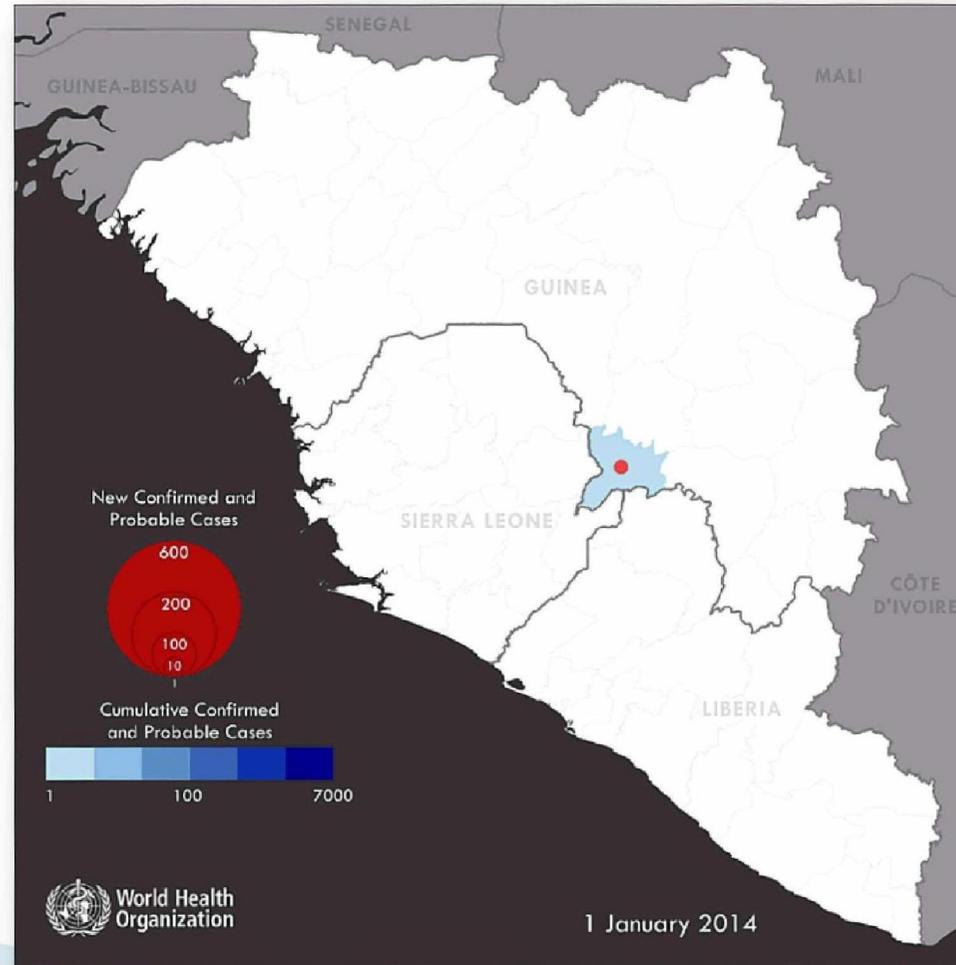
UNMEER was set up as a temporary measure to meet immediate needs related to the unprecedented fight against Ebola. The Mission deployed financial, logistical and human resources to Guinea, Liberia and Sierra Leone to support the push to zero cases:

How We Are Working to Stop the Ebola Outbreak



#EbolaResponse

Ebola outbreak 2014–2016 :
How the outbreak has unfolded



Source: WHO

<http://apps.who.int/ebola/our-work/achievements>

880 Healthcare workers
512 died

Countries with Widespread Transmission and other Countries Affected During the Epidemic

Country	Total Cases (Suspected, Probable, Confirmed)	Laboratory Confirmed Cases	Total Deaths
<i>Countries with Widespread Transmission</i>			
5.1.2a	3,814	3,358	2,544
	10,678	3,163	4,810
	14,124	8,706	3,956
<i>Affected Countries</i>			
5.1.2a	1	1	0
	8	7	6
	20	19	8
	1	1	0
	1	1	0
	1	1	0
	4*	4	1
Total	28,652	15,261	11,325

Access to essential
maternal and child
care services

~~Vaccination
programmes~~

Other infectious
diseases
(malaria)

Non-
communicable
diseases

Lessons of Ebola

- 40 countries implemented restriction, contrary to advice WHO
- Incidents triggered panic in society, unprecedented reaction
- 10,344 travelers under monitoring in US
- Reform of the WHO needed

From international activities to global response

Cholera epidemics: 1830, 1847 in Europe

- International governance of communicable diseases

1851: first International Sanitary Conference (convened by France);

- 10 conferences in the 19th century on cross-border aspects of cholera, plague, yellow fever

1905: Inter-American Sanitary Convention

notification for cases of cholera, plague, and yellow fever

1924: Pan-American Sanitary Bureau, Office International d'Hygiene Publique, Health Organisation of the League of Nations, and the Office International des Epizooties; epidemiological surveillance

1951: WHO adopts the International Sanitary Regulations (ISR)

1969: **ISR become International Health Regulations (IHR)**

IHR

multilateral regulatory mechanisms focusing on global surveillance for communicable diseases.

transboundary spread of **cholera, plague, and yellow fever**

maximum security against the international spread of diseases with a minimum interference with world traffic

requirements of health and vaccination certificates for travellers from areas infected by the three diseases

deratting, disinfecting, and disinsecting of ships and aircraft, health measures at airports and seaports

REVISED IHR: 2005



criteria to define a public health
emergency of international concern
(PHEIC)

What makes a PHEIC?

(Public Health Emergencies of International Concern)

- ✓ The virus is a public health risk to other states through the international spread
- ✓ It could require a coordinated international response
- ✓ The situation is serious, unusual or unexpected
- ✓ The decision to declare a PHEIC is made by the WHO's director-general and a committee of experts

Source: The World Health Organization

Core capacities to:

Detect
Assess
Report
Respond

national focal points
all WHO Member States

<https://www.ctvnews.ca/health/five-other-times-the-who-declared-a-global-health-emergency-1.4782443>

PHEIC Declared by the WHO

How many PHEIC have been declared by WHO?

GO to the CHATBOX

0

▶ H1N1 influenza (2009)

4

▶ Polio (2014)

6

▶ Ebola (2014); Ebola (2019)

10

▶ Zika (2016)

23

Revision 2005
Implementation IHR (comply with core capacities, notify events – all hazard approach)

Always Notifiable

- Smallpox
- Poliomyelitis due to wild-type poliovirus
- Human influenza caused by a new subtype
- Severe acute respiratory syndrome (SARS)

Potentially Notifiable Events:

- cholera, pneumonic plague, yellow fever, viral hemorrhagic fever, and West Nile fever, as well as any others that meet the criteria laid out by the IHR.
- Other biological, radiological, or chemical events that meet IHR criteria

International Health Regulations (IHR) Protecting people every day

What are the IHR?

The International Health Regulations (IHR) represent an agreement between 196 countries, including all WHO Member States, to work together for global health security. Under the IHR, all countries must report events of international public health importance.

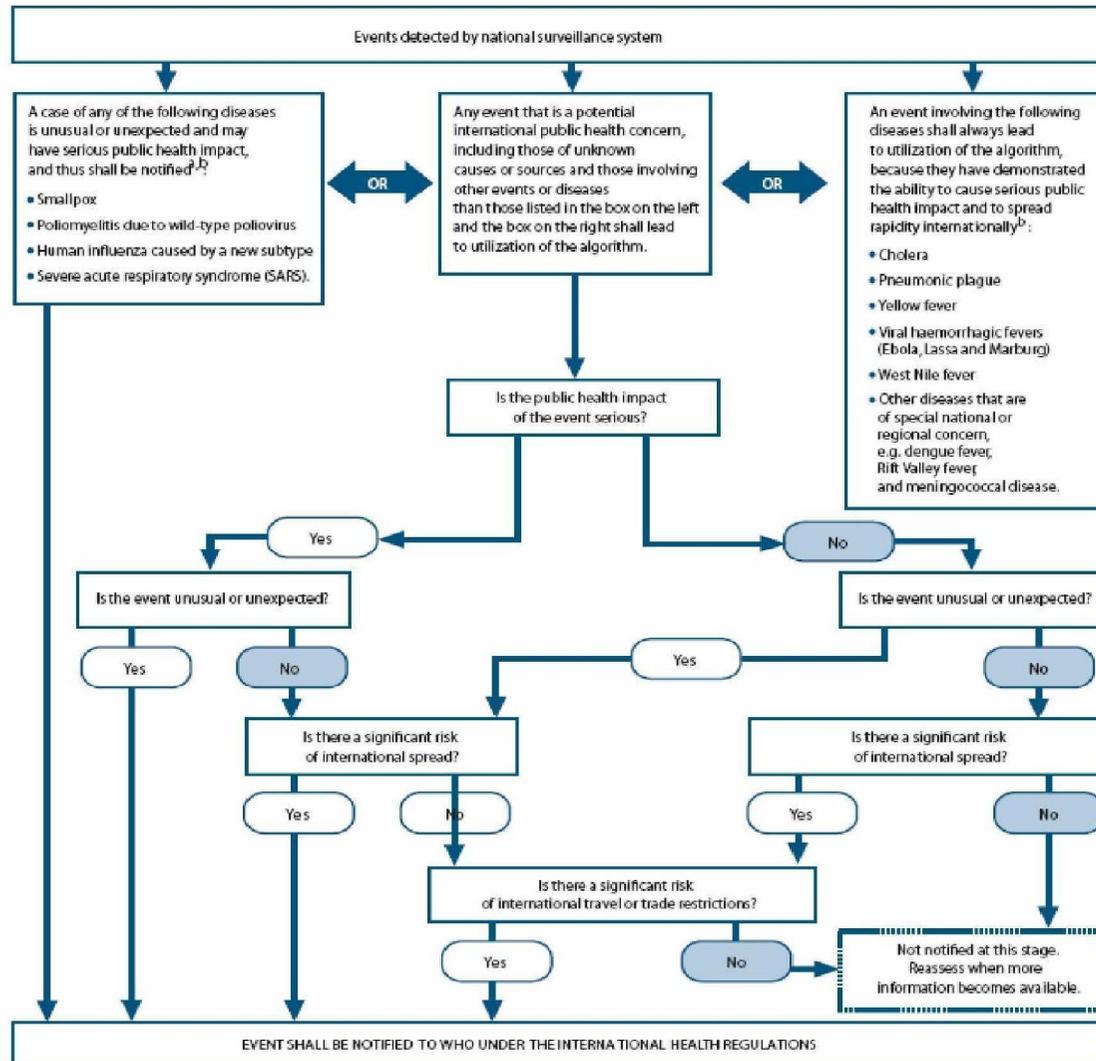


We share a responsibility to protect our world from outbreaks of infectious diseases and other health threats. The goal of the IHR is to stop events in their tracks before they become international emergencies.

Source: Report to the Director-General of the Review Committee on Second Extensions for Establishing National Public Health Capacities and on IHR Implementation, November 2014



0-229693-9

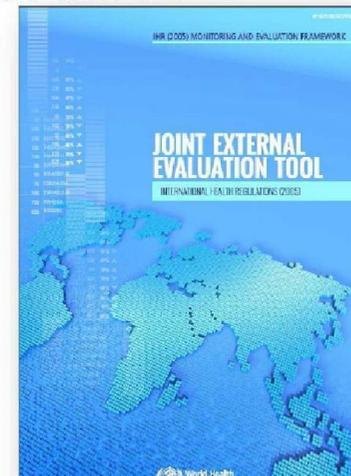


* Extracted from Annex II of IHR (2005).

^a As per WHO case definitions. ^b The disease list shall be used only for the purposes of these Regulations.

Enhanced global preparedness IHR Monitoring Framework

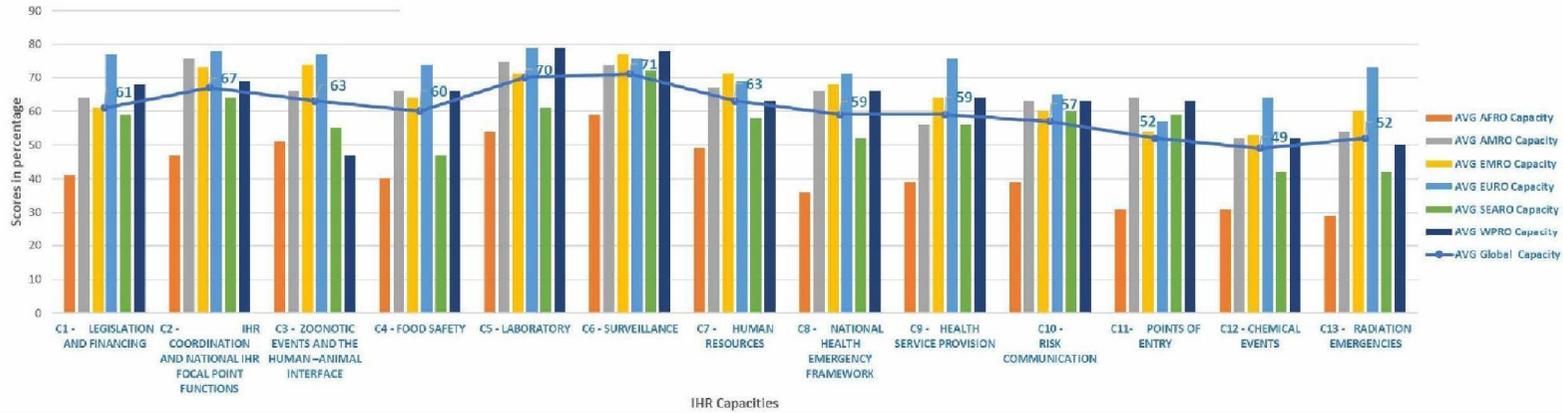
- ▶ E- SPAR (State Parties Annual Self Assessment and Reporting Tool)
 - 13 capacities
- ▶ JEE
- ▶ After Action Reviews, table top exercises





2018 State Parties Self-Assessment Annual Reports on IHR Implementation - Scores per Capacity in Percentage by WHO Regions - Reports on SPAR2018 format GLOBAL N= 182 (93%) out of 189 (96%) submitted / 196 (100%) State Parties

N= BY REGION: AFRO (47/47=100%); AMRO (31/35=89%); EMRO (21/21=100%); EURO (49/55=89%); SEARO (11/11=100%); WPRO (23/27=85%)



BREAKOUT SESSION 1

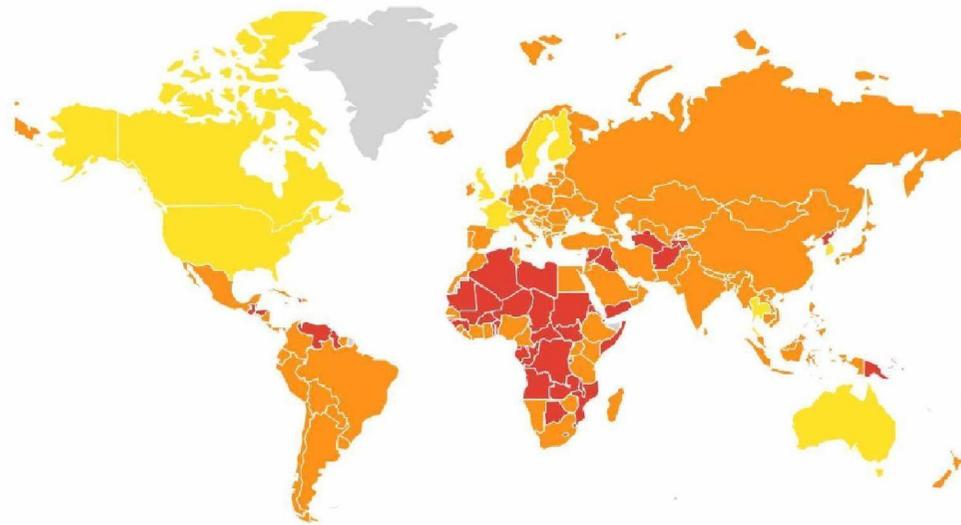
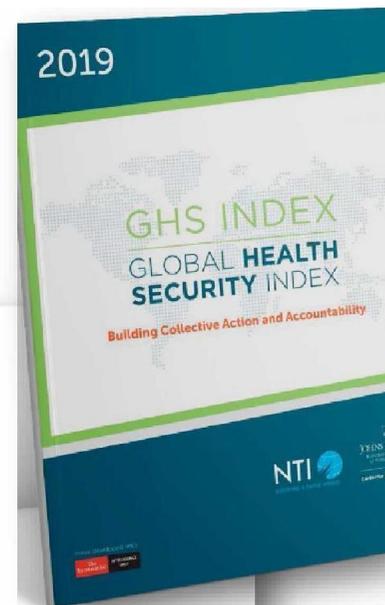
Analyze the strengths and weaknesses of the global preparedness for COVID-19, second wave 2020

- Which capacities are well developed?
- Which capacities are most vulnerable?
- Which WHO geographic region needs enforcement of the capacities

Ignore chemical and nuclear capacities as not relevant for the topic of the exercise



How prepared was the world for a new pandemic (ranking 2019)
the Global health security index
for response



Key

- Most Prepared
- More Prepared
- Least Prepared

Select a country to see Overall Score/Rank and access a full country page.

to see Overall Score/Rank and to access the country page

<https://www.ghsindex.org/>

COVID, WHO

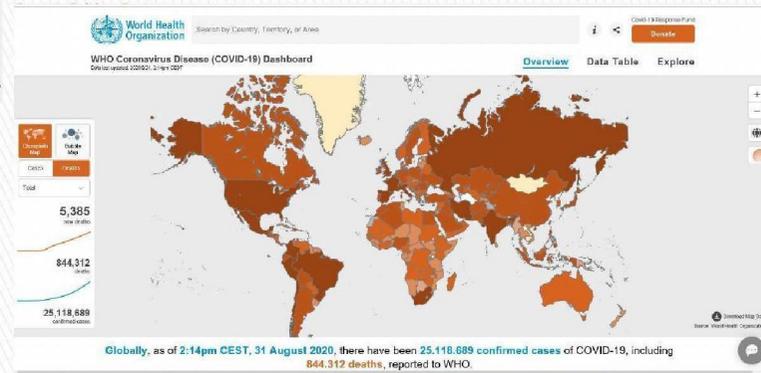
DISCUSSION

– Rationale for the incidence of COVID in countries with high GHSI?

GO TO CHATBOX



Global situation: COVID cases, August 31, 2020



Global situation: COVID deaths, August 31, 2020

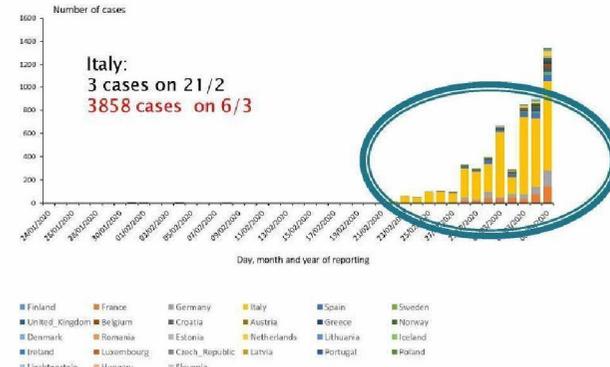
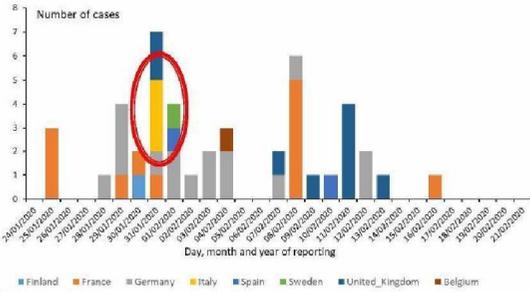
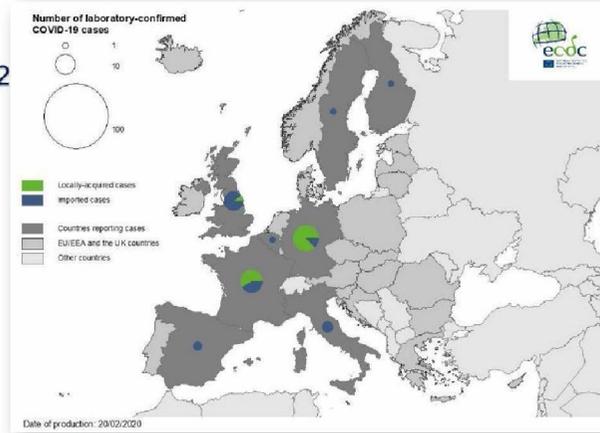
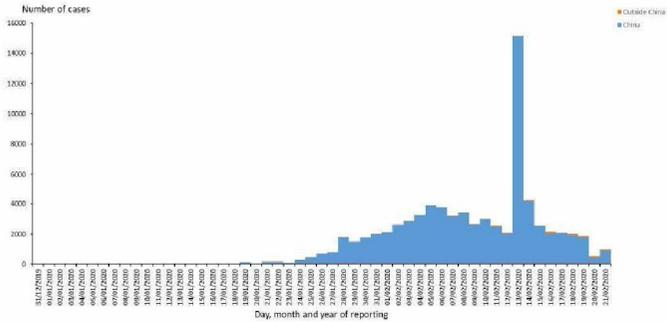
COVID- 19 in retrospect

The first wave



Distribution of COVID-19 cases (according to the applied case definition in the country) by country and region, as of 21 February 2020

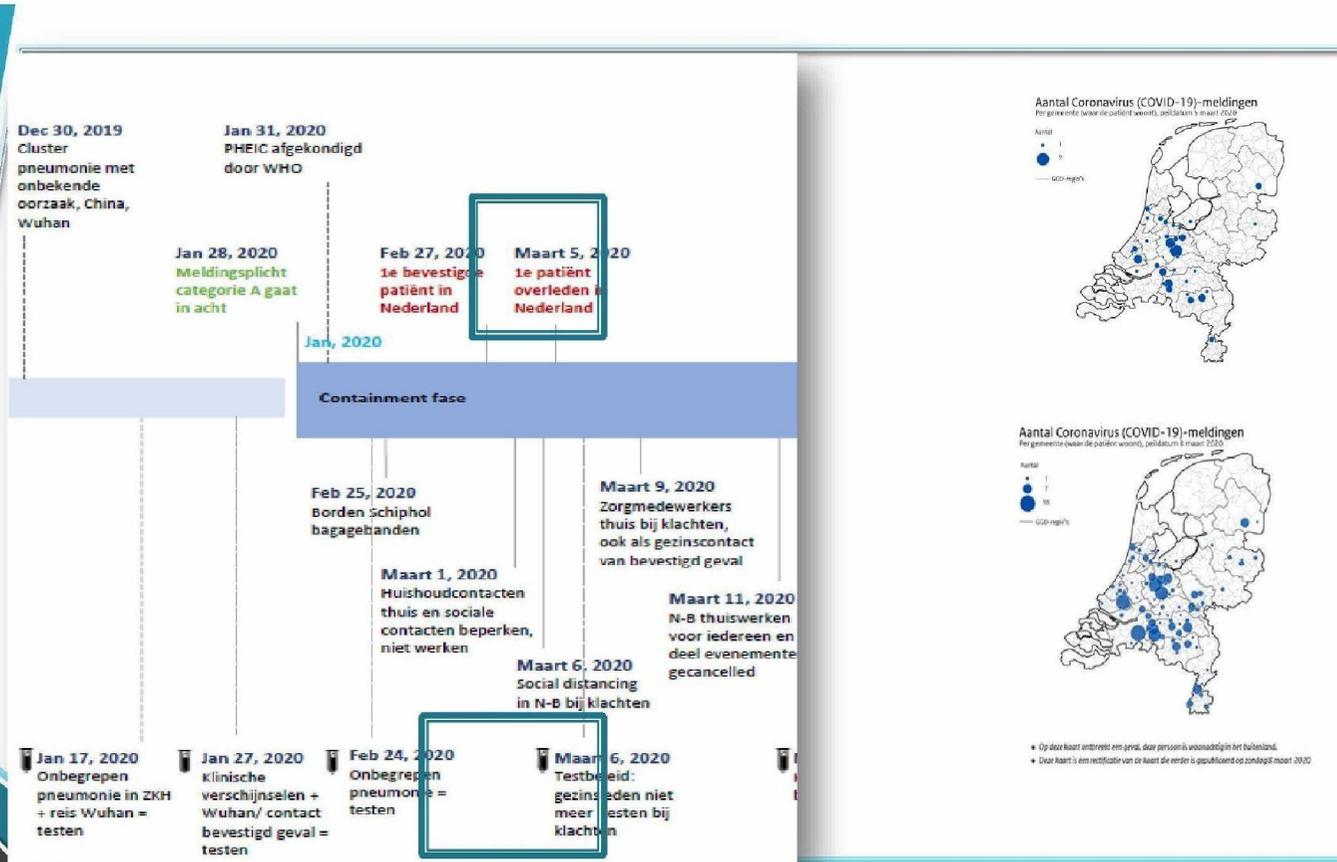
All countries

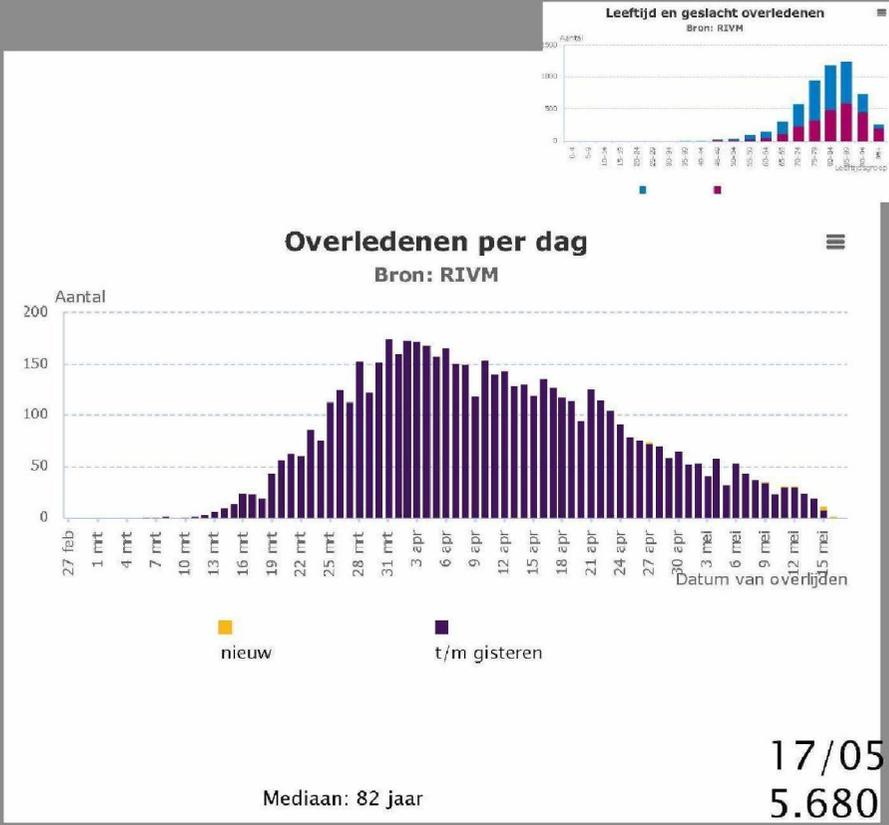
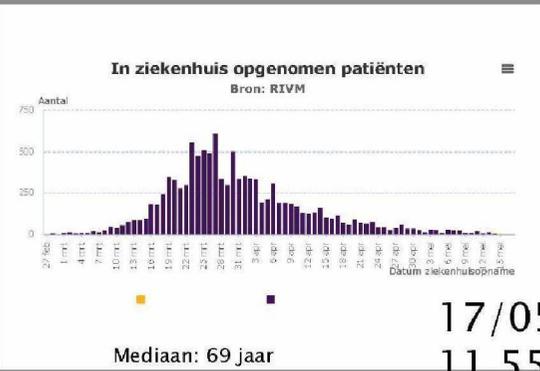
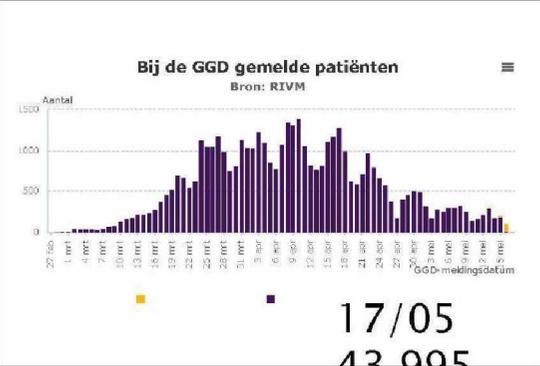


Bron: ECDC

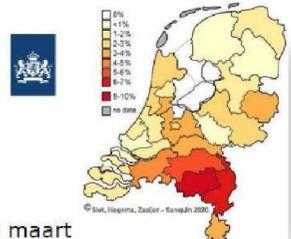
Distribution of COVID-19 cases (according to the applied case definition in the country) in EU/EEA and the UK, as of 6 March 2020

What happened in the Netherlands?





COVID-19 uitbraak ziekenhuisopnames per 2 weken



Seroprevalentie antistoffen
Dank: prof. H Zaaijer, Sanquin

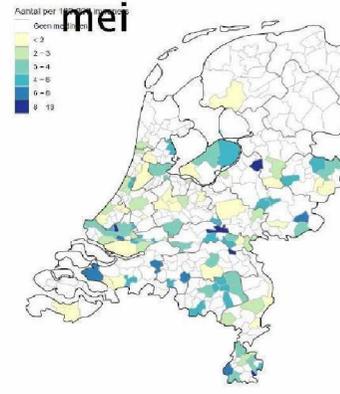
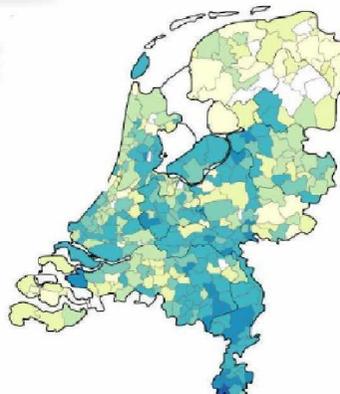
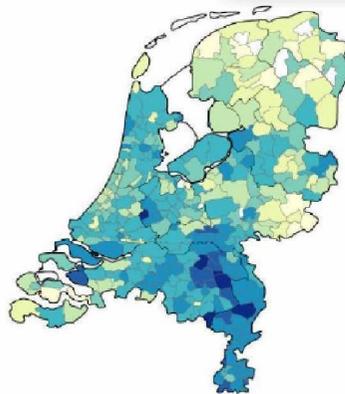
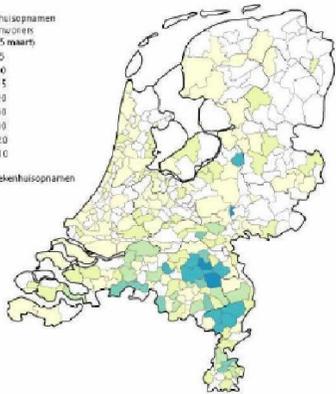
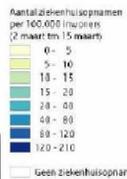
top IC-bezetting 7 april:
1.332 bedden COVID-19

2-15 maart

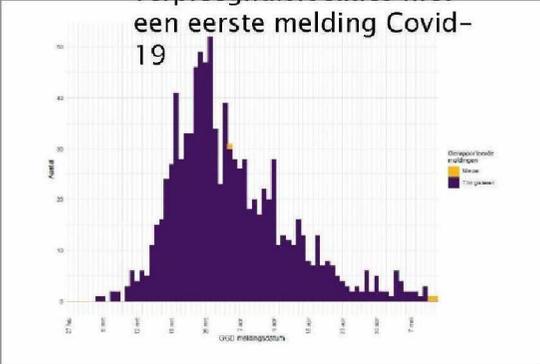
16-29 maart

30 maart - 12 april

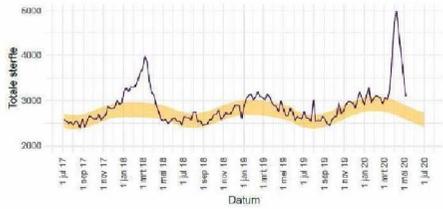
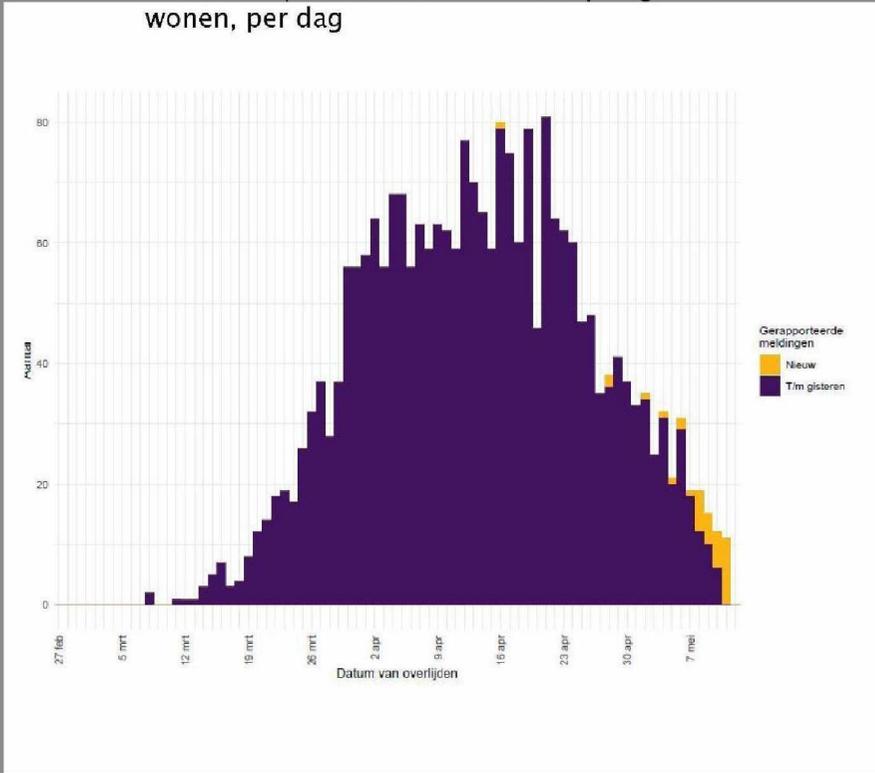
3 mei-16 mei



Nieuwe verpleeghuislocaties met een eerste melding Covid-19

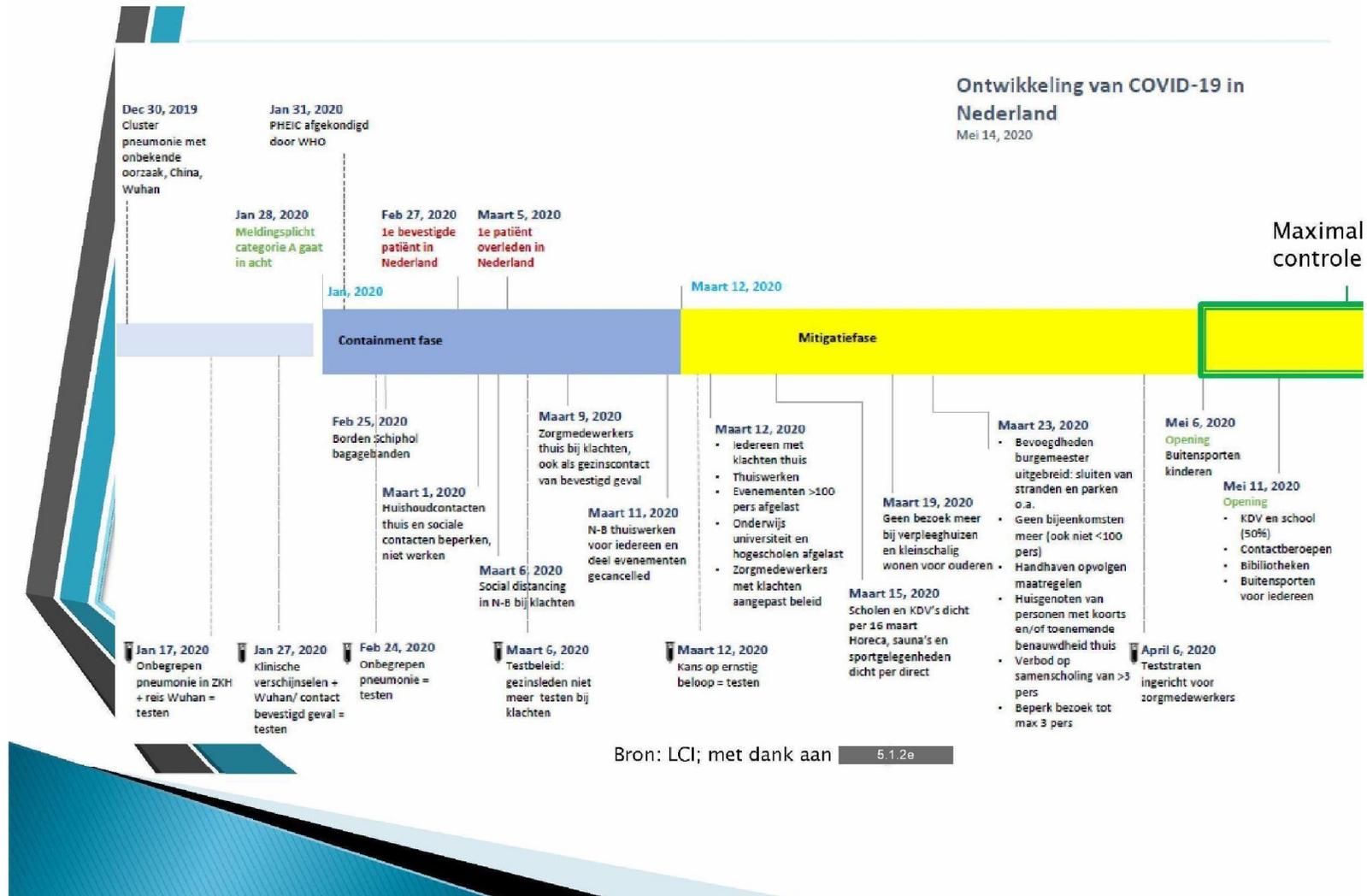


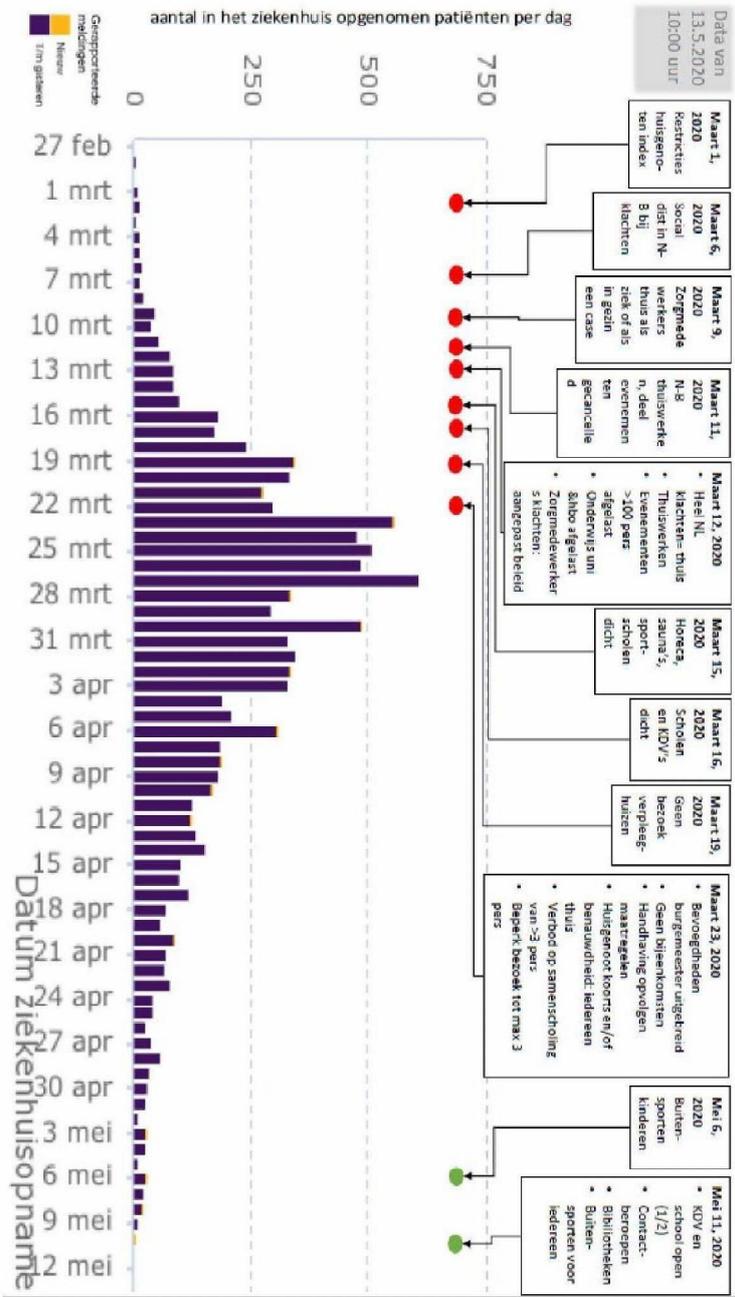
Overleden patiënten die in een verpleeghuis wonen, per dag



oversterfte

Bronnen: RIVM, CBS, VERENSO, NIVEL

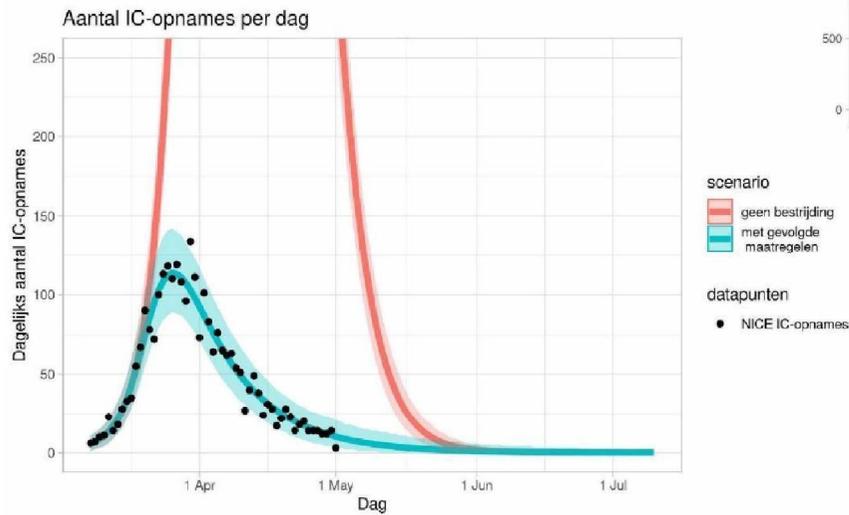




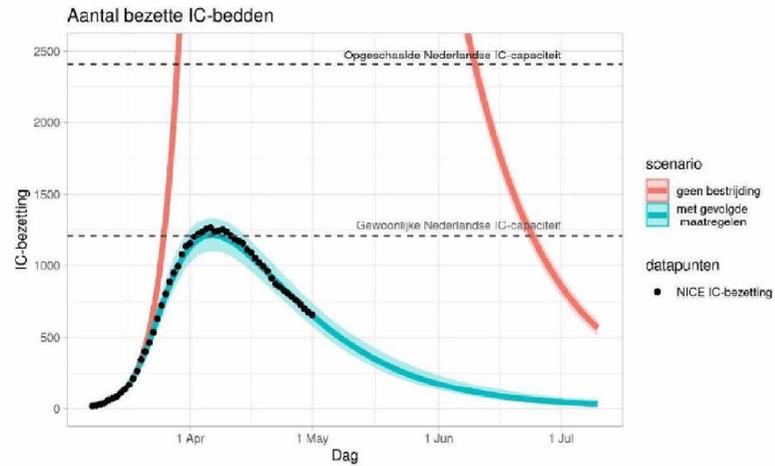
Bron: LCI; met dank aan

1.2

Nieuwe IC-opnames van patiënten met COVID-19



gegevens in figuur niet gecorrigeerd voor rapportagevertraging

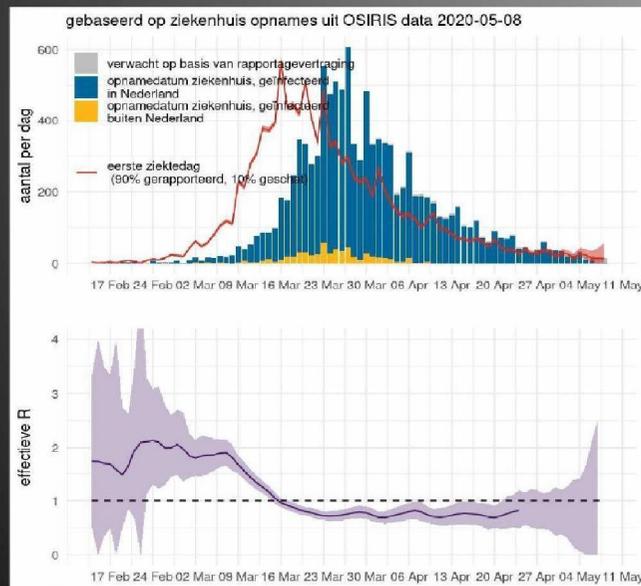


Bezette IC-plaatsen door patiënten met COVID-19

Bron: EPI/RIVM

Dank: 5.1.2e

Indicator voor transmissie: reproductiegetal (R0)



- ▶ OSIRIS
- ▶ **Blauw**: aantal meldingen ziekenhuisopname naar opnamedatum
- ▶ **Grijs**: verwachte meldingen (correctie voor rapportagevertraging)
- ▶ **Rood**: aantal ziekenhuisopnames naar eerste ziekte dag
- ▶ Data meer recent dan 24 April zijn onzeker.
- ▶ **Paars**: reproductiegetal, aantal secundaire besmettingen per geval
 - reflecteert de toename en afname van de rode epicurve
 - berekend volgens Wallinga & Lipsitch Proc R Soc B 2007
- ▶ Schattingen meer recent dan 24 April zijn onzeker.

Bron: afd Modelling/EPI/RIVM
Dank: prof. J Wallinga

WHO
Euro

Results – Relevant dates

NPI= non-pharmaceutical
interventions

Country	Case 1	Case 100	Death 1	Death 10	First national NPI	Testing mild cases stopped	Days to first national NPI
5.1.2a	22/02	24/02	24/02	26/02	30/01 (04/03) ^b		-23 (11) ^b
	26/02	09/03	13/03	19/03	12/03		15
	26/02	02/03	10/03	16/03	17/03		20
	26/02	03/03	05/03	10/03	13/03	11/03	16
	26/02	07/03	06/03	15/03	13/03		16
	27/02	03/03	27/02	08/03	13/03	11/03	15
	27/02	07/03	14/03	25/03	12/03	13/03	14
	27/02	07/03	21/03	21/03		11/03	
	28/02	11/03	16/03	22/03	13/03	12/03	14
	28/02	07/03	05/03	14/03	12/03		13
	28/02	06/03	07/03	14/03	21/03	13/03	22
	02/03	08/03	12/03	20/03	14/03		12

^a The country implemented NPI at subnational level (i.e. regional, provincial or local) before national NPI were announced

^b Italy banned travelers from China on the 30/01/2020. Information in brackets relates to the first NPI after detecting cases in the country

Bron: WHO
Euro, 2 April,
cor

Results – Dates of NPI implementation

WHO Euro

Category	Educational institutions	Mass gathering				Cordon sanitaire	
Country	Schools	Shops	Restauration	Culture	Sports	Blanket restrictions	Border control
5.1.2a	04/03	12/03	12/03	08/03	04/03	10/03	30/01
	13/03	17/03	17/03	12/03	17/03	17/03	18/03
	17/03	20/03	23/03	20/03	20/03	23/03	18/03
	13/03	15/03	15/03	15/03	15/03	15/03	16/03
	13/03	17/03	17/03	17/03	17/03	21/03	16/03
	13/03	15/03	15/03	15/03	15/03	17/03	
	12/03		12/03	12/03	12/03		16/03
	13/03	18/03	18/03	13/03	18/03		14/03
	16/03	16/03	16/03	12/03	16/03	23/03	
	21/03	21/03	21/03	21/03	21/03	24/03	
14/03	18/03	14/03	14/03	14/03	18/03		
Number of countries	11	10	11	11	11	9	7

Bron: WHO EURO
2 april

In bold appears highlighted the earliest national NPI implemented by the country

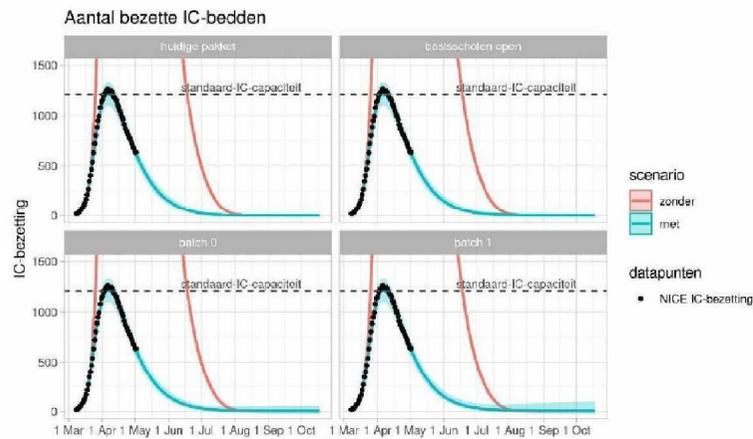
Blanket restrictions¹⁾: considered when gatherings of >5 people prohibited

GOALS

- Maximum control of the virus
- Health care services remain accessible
- Protection of vulnerable people/groups

RELAXATION OF THE MEASURES

► Modelling



Winkels, markten, dierentuinen,
pretparken, natuurparken
vakantieparken (eigen toilet,
badkamer), buitenzwembaden
rechtspraak

non-contact sporten
contactberoepen
bibliotheken

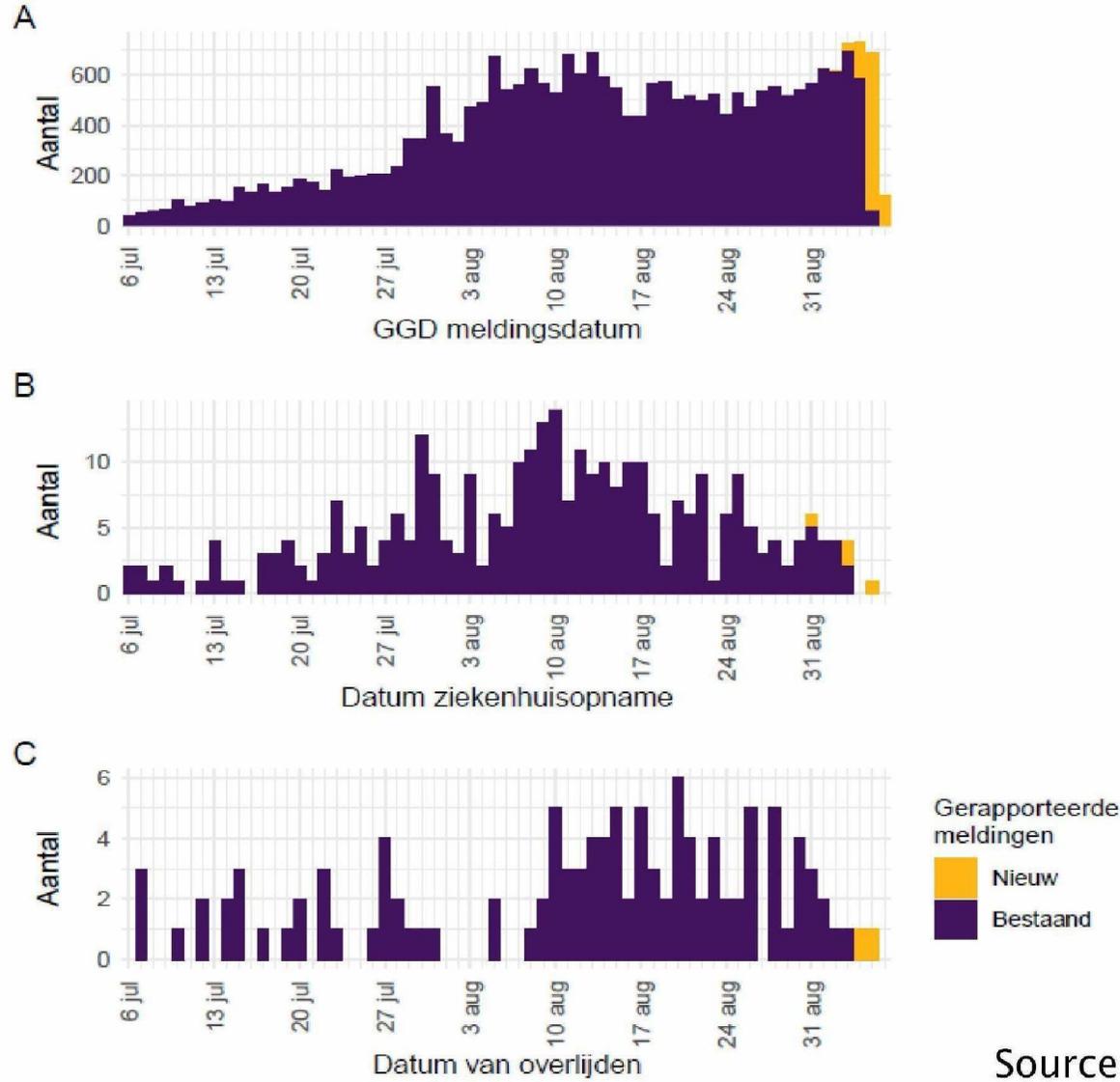
Measures

- algemene hygiënische maatregelen
- afstand houden
- thuis werken
- thuisblijven bij klachten
- testen
- bron- en contactopsporing

Monitoring

- epidemiologische parameters (voortgang epidemie, R_0)
- data uit de teststraten
- data uit virologische dagstaten
- verpleeghuismonitoring
- indicatoren van effectiviteit BCO
- mobiliteit
- compliance m.b.t. gedrag
- seroprevalentiestudies (Pienter Corona, Sanquin)
- NIVEL peilstations

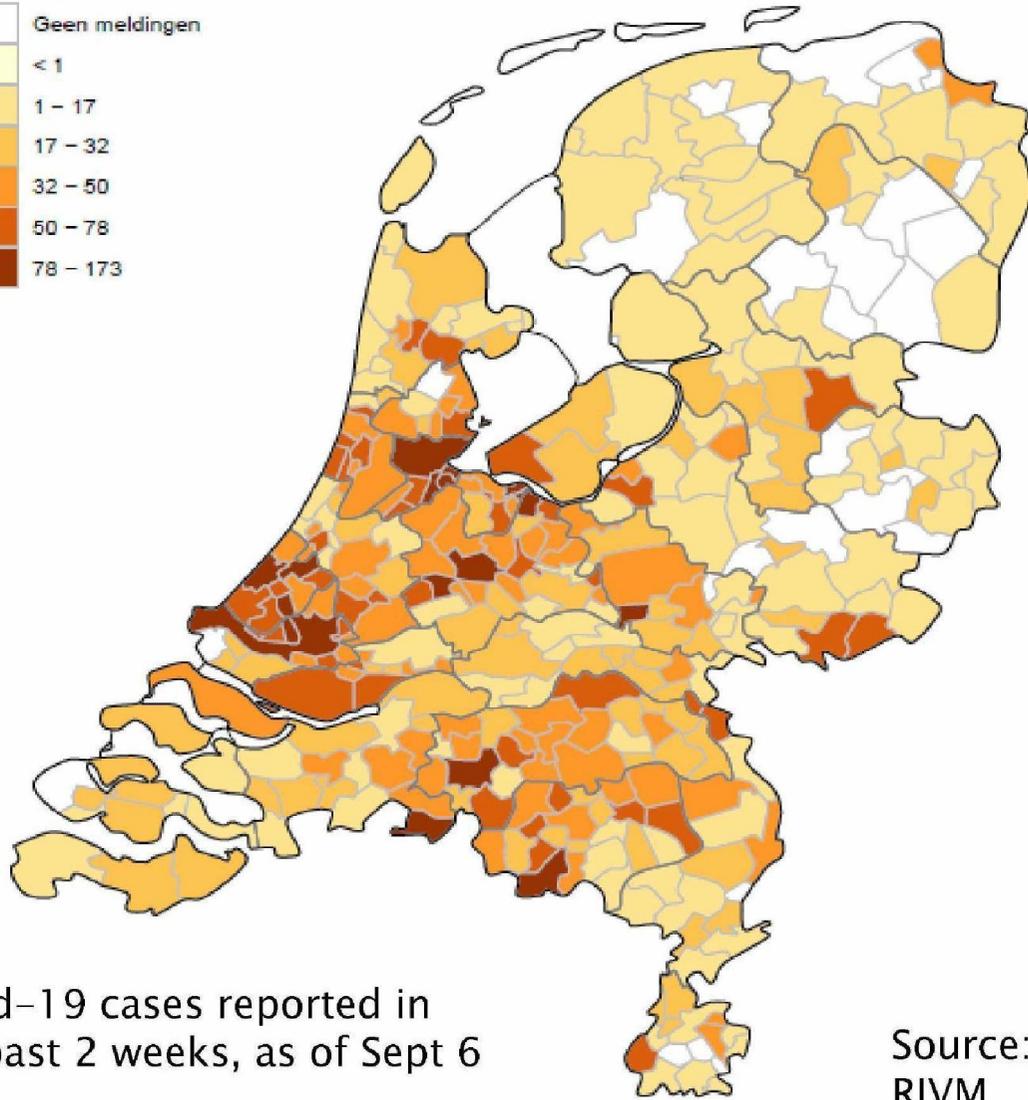
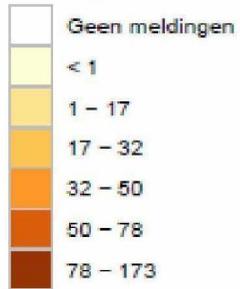
Positive cases, hospital admissions and deaths since July 6



Source: RIVM



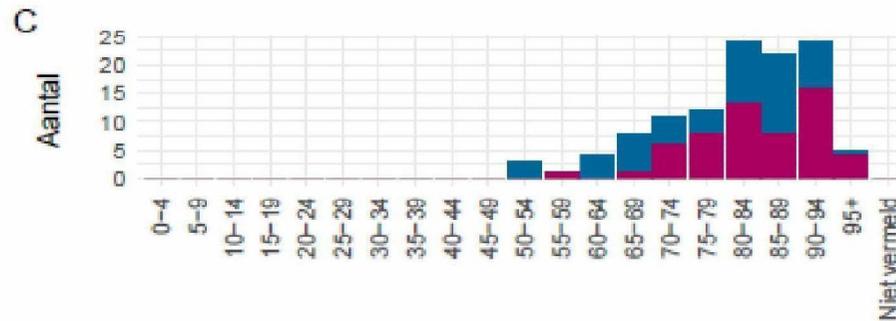
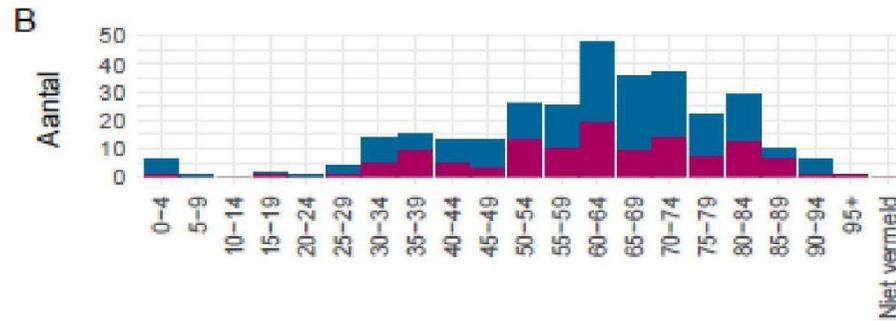
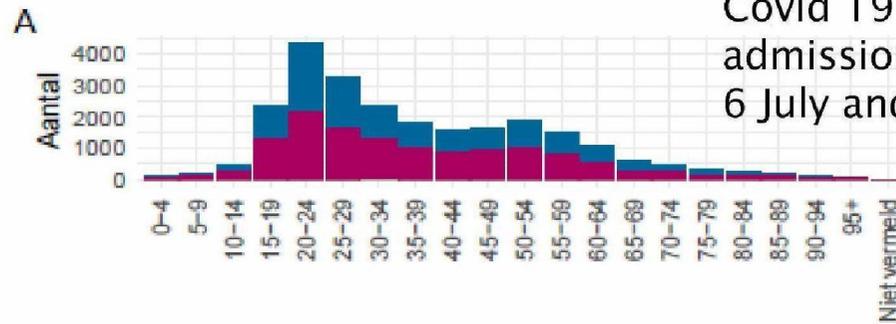
Aantal per 100.000 inwoners



Covid-19 cases reported in the past 2 weeks, as of Sept 6

Source: RIVM

Age and sex distribution of Covid 19 cases, hospital admissions and deaths, between 6 July and 6 Sept 2020

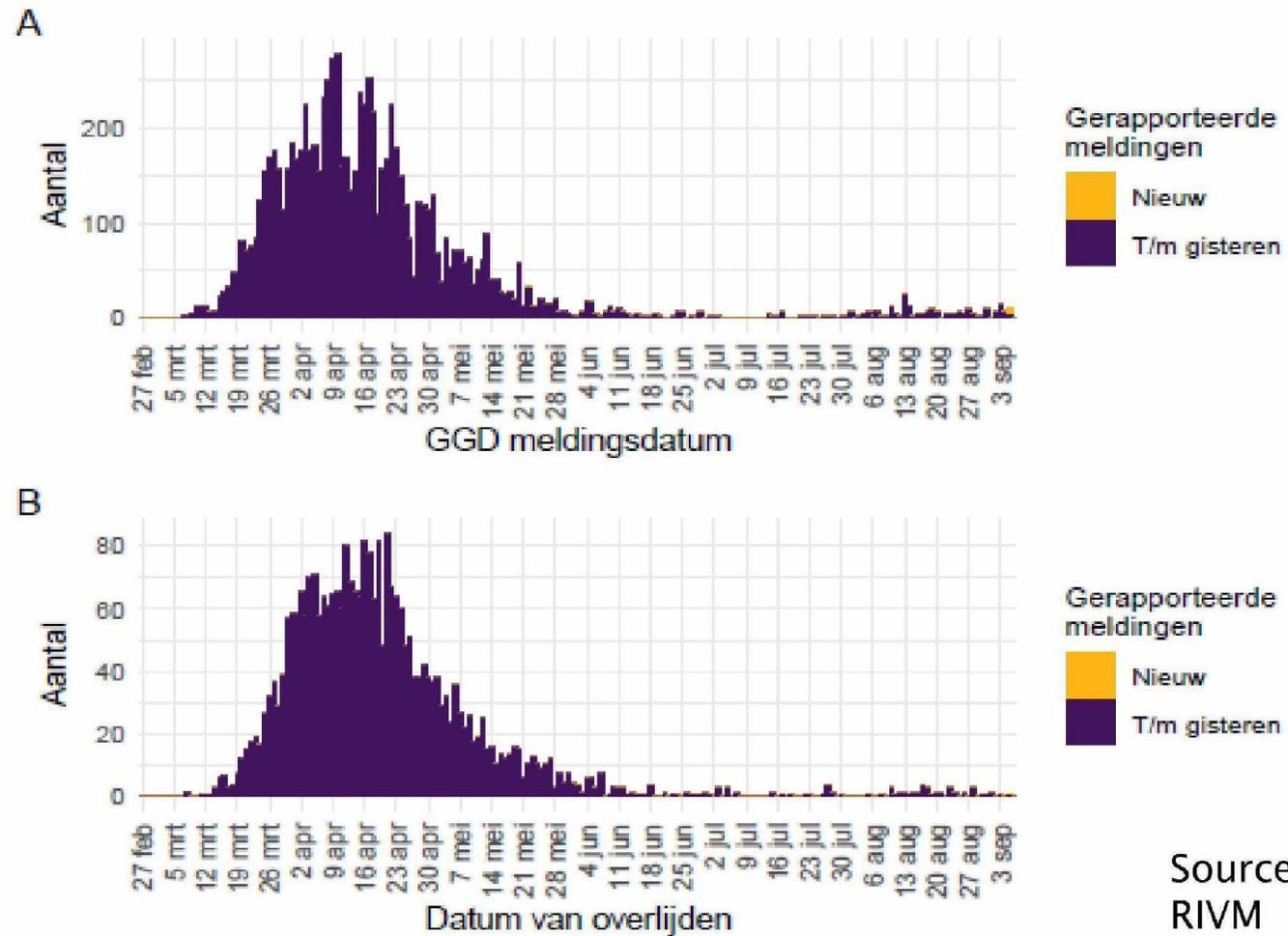


Geslacht
 Man
 Vrouw
 Niet vermeld

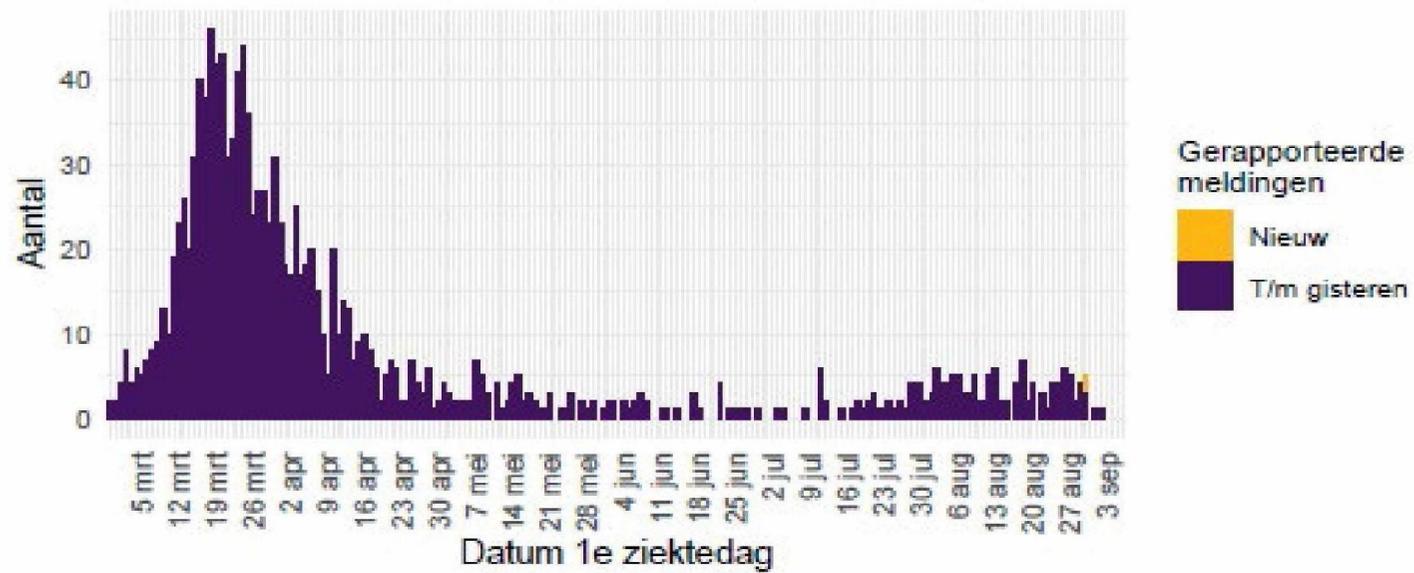
Source:
RIVM



Number of cases and deaths in nursing home patients



Number of newly reported affected nursing homes



Source: RIVM

Breakout session 2: exercise



COVID-19: what have we learned so far?

- ▶ Optimal detection systems
- ▶ Laboratory capacity
- ▶ Surveillance and high capacity for source and contact tracing
- ▶ (real-time) analysis
- ▶ Comprehensive monitoring
- ▶ Stepwise approach to relaxation of measures
- ▶ Clarity about required behavior (hygiene, social distancing, teleworking, testing, isolation, quarantine)
- ▶ Continuous monitoring of compliance and behavior
- ▶ Clear command and control structure
- ▶ Communication
- ▶ Protection of the vulnerable groups/people
- ▶ Access to hospital care
- ▶ Availability of medical countermeasures (treatment, antivirals)
- ▶ Availability of non-medical countermeasures
- ▶ Vaccines

Wrap-up!



Prominent place
in history

Lessons learnt

Successes and
failures of
containment



Time for coffee!

