



National Institute for Public Health and the Environment

Preparedness, outbreak management and vaccine use in crises

5.1.2e

5.1.2e

5.1.2e

5.1.2e

5.1.2e

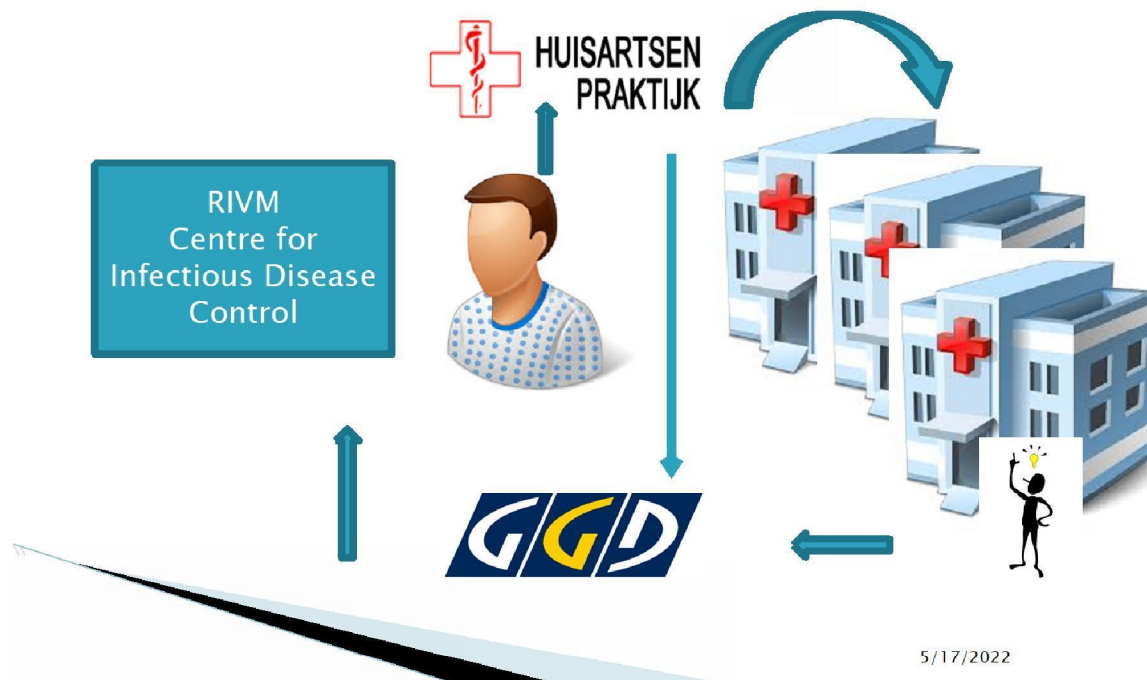
Head National Coordination Centre for Communicable Disease Control, RIVM

In today's lecture you will learn about:

- * Examples on how to guide outbreak-response
- * Examples on how to use vaccines for outbreak control
- * The current state of the COVID-19 pandemic



The network for communicable diseases



Key players in preparedness and outbreak management

governmental

National level

- Ministry of Health, Welfare and Sports, EZ, SoZa
- Dutch Centre for Infectious Disease Control (CIb), RIVM
- CVI Lelystad (Institute for animal health and science)
- Health Inspectorate (IGZ), NVWA (Food safety authority)
- GD

Regional level

- Municipal Health Services (25 GGD)
- Disaster Medicine Organization (25 GHOR)
- Hospitals, medical specialists
- (Public Health) Laboratories

Local level

- General Practitioners (9.000 GP)
- Veterinarians

private

The Netherlands

Public Health Act
(= *Wet Publieke
Gezondheid*)

Notification: Most
powerful instrument to
enable the (local)
government to control
infectious diseases

Municipalities primarily
responsible for infectious
disease control and
preparedness

Role Minister of Health in
outbreaks or crises

393 municipalities

25 municipal health
services
25 Safety regions

GGD-regio's 2014



Centre for Infectious Disease Control

Scientific advice in
crises

Coordination of
response (LCI)

Surveillance of
communicable
diseases

Collaboration with
international
organizations (ECDC,
WHO)

Specialized
(reference) laboratory
(IDS, LZO, IIV)

Crisis communication

- Professionals
- Press
- Public



Public Health ACT: mandatory notification for infectious diseases

A	MERS smallpox polio SARS viral hemorrhagic fevers SARS-CoV-2	Isolation, testing Prohibition to work Quarantine and monitoring of contacts
B1	avian flu diphtheria, plague, rabies, TB.	Isolation, testing Prohibition to work
B2	a.o. typhoid fever, cholera, hepatitis, measles	Prohibition to work
C	o.a botulism, meningococcal- disease legionnaires	No restrictive measures

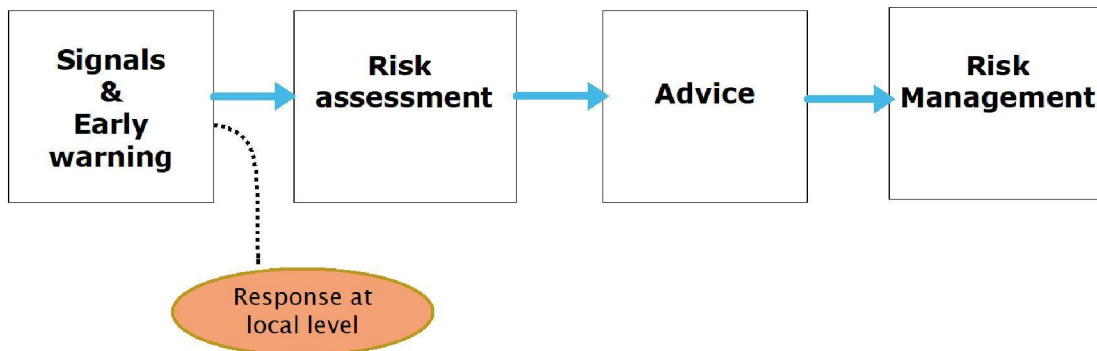
Emergency preparedness

capacity and capability of a country to manage efficiently all types of emergency and to bring about an orderly transition from relief through recovery and back to sustainable development.

How can preparedness be achieved?

- national legislation and policy for disaster management
- plans and procedures for disaster management and emergency response coordination
- strengthening institutional and human resources for disaster management
- establishing and managing stocks of relief supplies and equipment
- identifying transportation options
- public education, awareness and community participation in disaster management
- **collecting, analyzing and disseminating information related to emergencies that are likely to occur in the region**

OUTBREAK MANAGEMENT



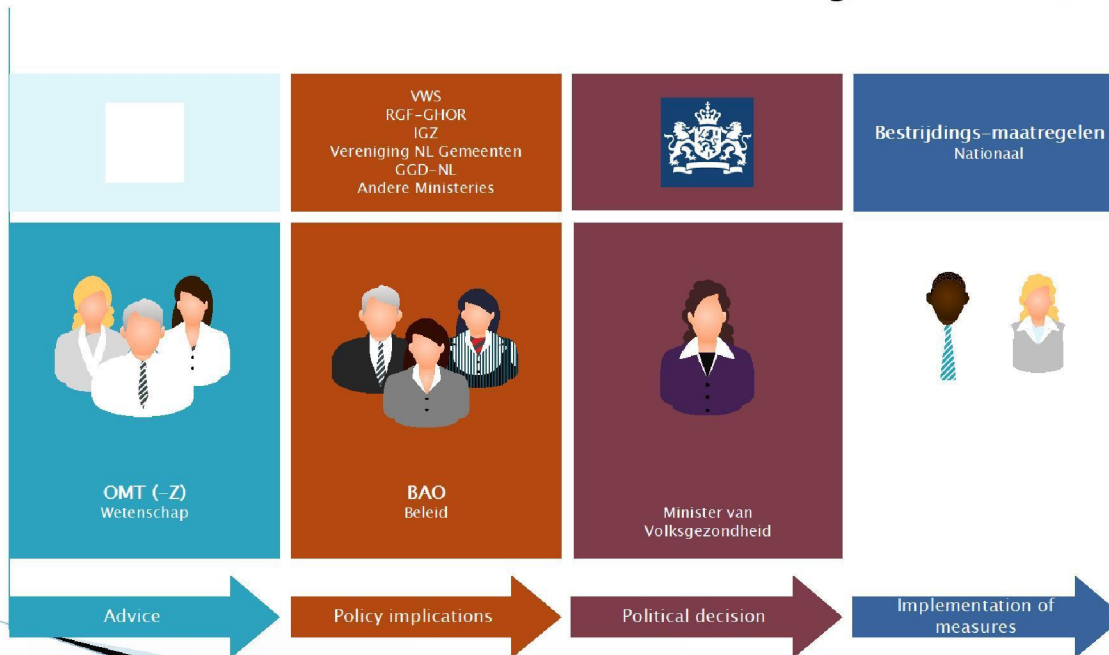
RISK COMMUNICATION

Outbreak management structures and procedures

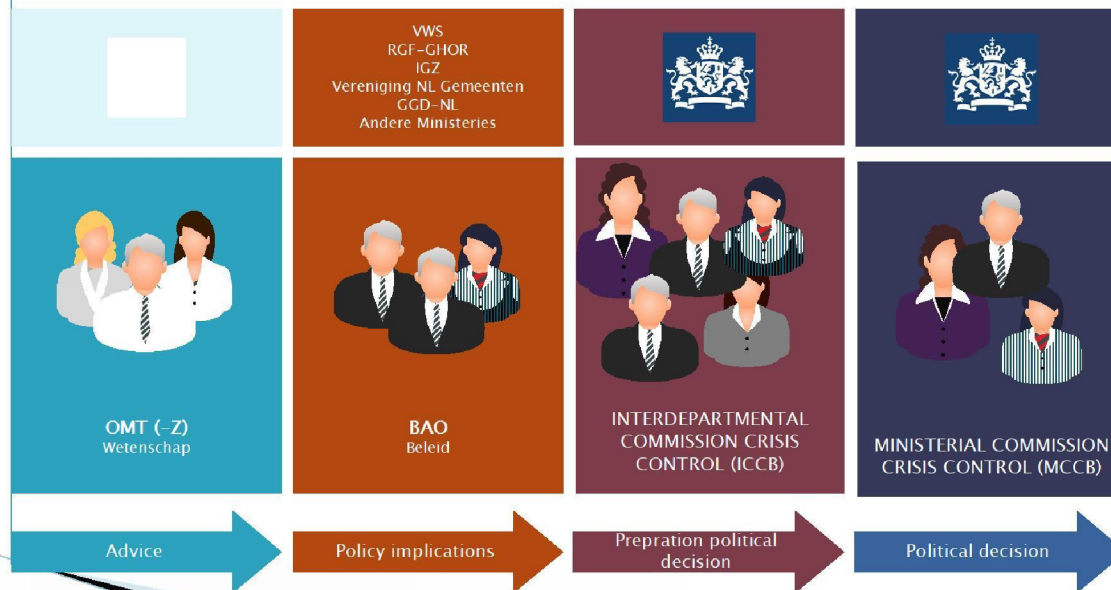
- * Early warning weekly committee
- * Response teams for small scale outbreaks
- * National outbreak management team (OMT): in crises



The structure for crises control (Outbreak Management Team)



The national structure for COVID-19 pandemic



OMT at national level

1992 poliomyelitis outbreak



1994 plague epidemic in India

1995 Ebola outbreak in Zaïre

1995 diphtheria (Dordrecht)

1996 rabies (Alkmaar)

1996 *B. pertussis* epidemic

1997 cluster meningococcal C disease (Putten)


1997 Influenza A/H5N1 in Hong Kong

1999 Legionnaire's disease (Bovenkarspel)


1999 measles outbreak

2000 meningococcal W135 disease: import cases after Hadj

Bron: LCI

2001	cluster meningococcal C disease West Brabant	
2001	anthrax/bio-terrorisme threat (anthrax-letters)	
2003	Influenza /fowl plague AI/H7N7	
2003	SARS	
2004	Lymphogranuloma venereum (LGV)	
2004	rubella outbreak	
2005	<i>Clostridium difficile</i> associated diarrhea	
2005	v-CJD	
2006	MRSA in pig farms	
2006	deaths due to seasonal flu vaccination	
2007	outbreak of Q fever	

Bron: LCI

2008	outbreak of Q fever	
2008	Marburg hemorrhagic fever	
2009	outbreak of Q fever	
2009	swine flu (A/H1N1)	
2010	outbreak of Q fever	
2011	outbreak of mumps	
2011	EHEC	
2012	Men C in MSM	
2013	Measles	
2013	MERS	
2014, 2015	Ebola	
2016	Zika	
2018	MenW	

2020-2021 COVID-19 ; 40X

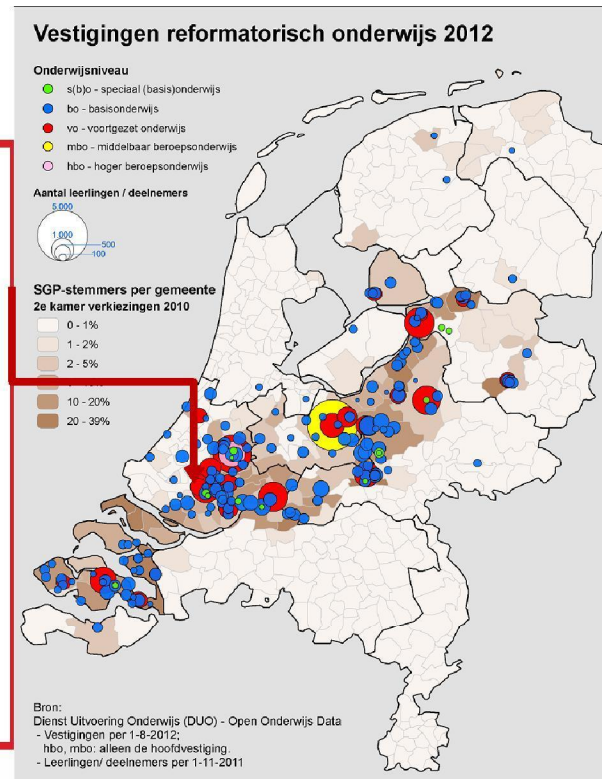
Examples of outbreaks



Measles!

- * 20-3-2013
- * Suspicion measles, 13 yrs girl, orthodox protestant
- * MMR vaccination coverage religious group: 50-60%
- * 10 children in the household (unvaccinated)

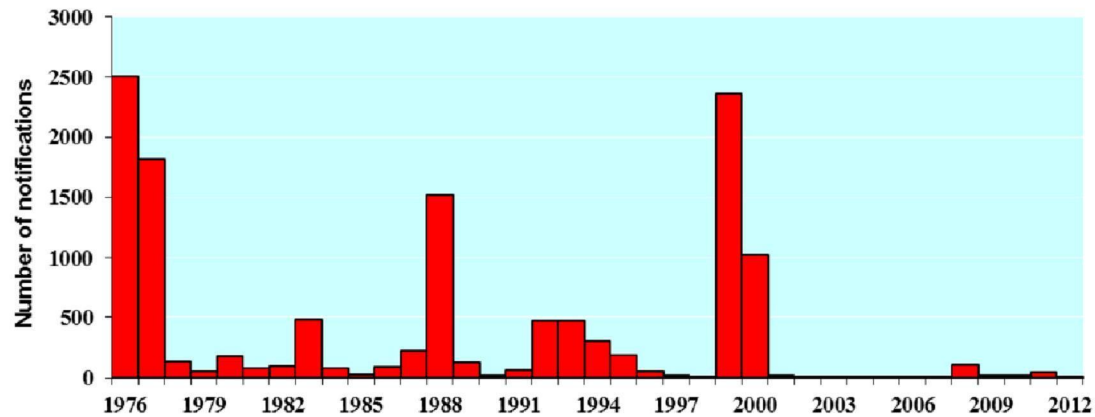
- * 21-3-2013
- * Laboratory confirmation PCR and serology
- * **Response team** to monitor progression



5/17/2022

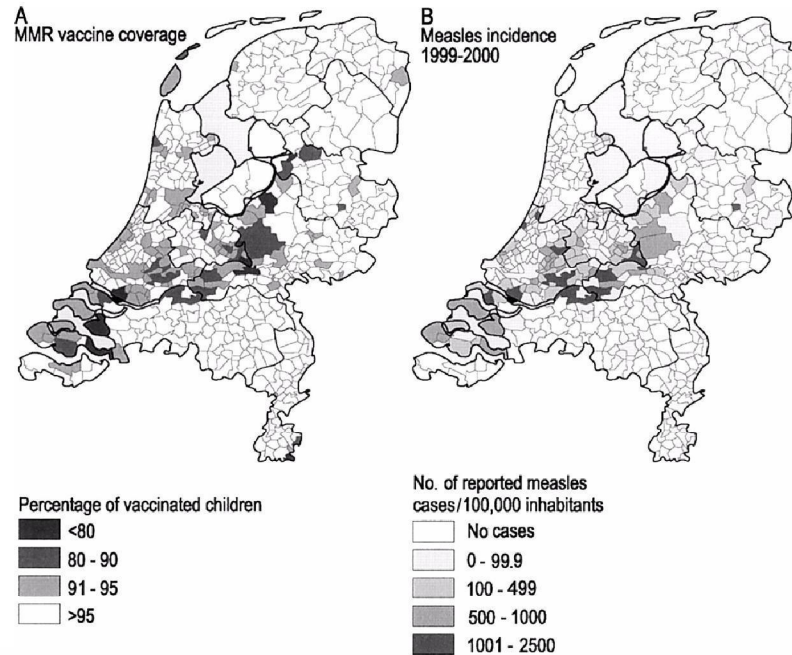
17

Measles notifications in the Netherlands 1976 – 2012



Acknowledgments: 5.1.2e, RIVM

A Municipal vaccine coverage of first measles, mumps, and rubella (MMR) dose (1996 birth cohort at 1 January 1999).



van den Hof S et al. *J Infect Dis.* 2002;186:1483-1486

Measles

fever, runny nose,
cough, red eyes, and
sore throat

rash that spreads
over the body

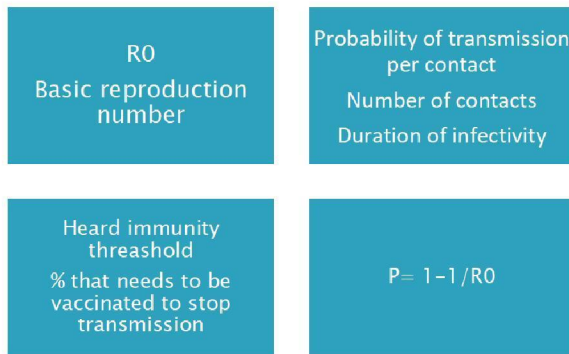
highly contagious
virus

spreads through the
air through coughing
and sneezing

Very effective live
attenuated vaccine
available
(MMR, MMRV)
In NL: 14 m, 9 y



Measles



Vaccine coverage of > 95 % to prevent outbreaks of measles

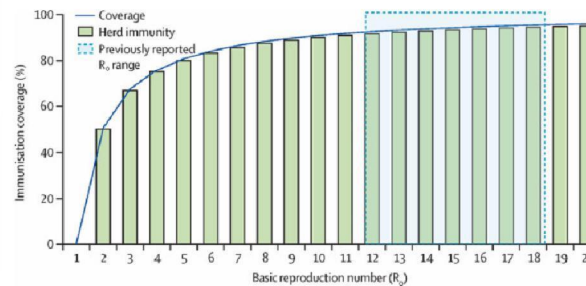


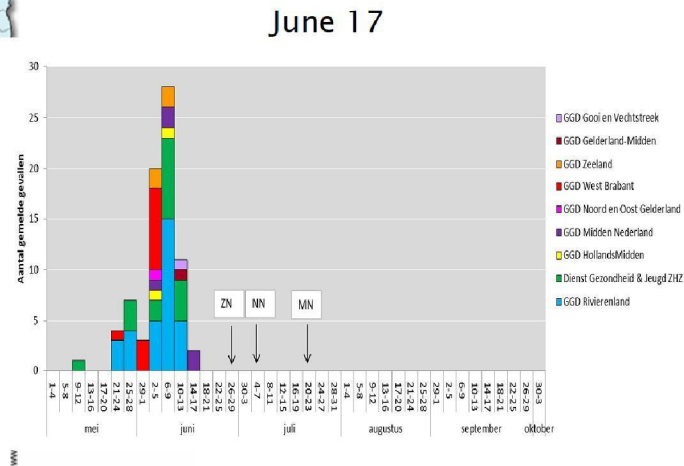
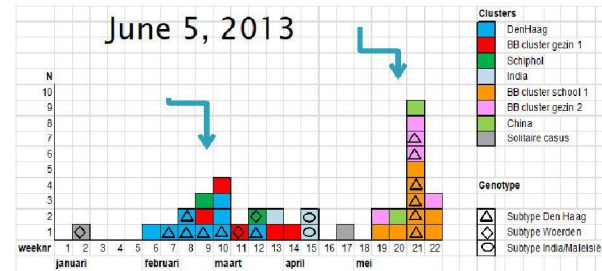
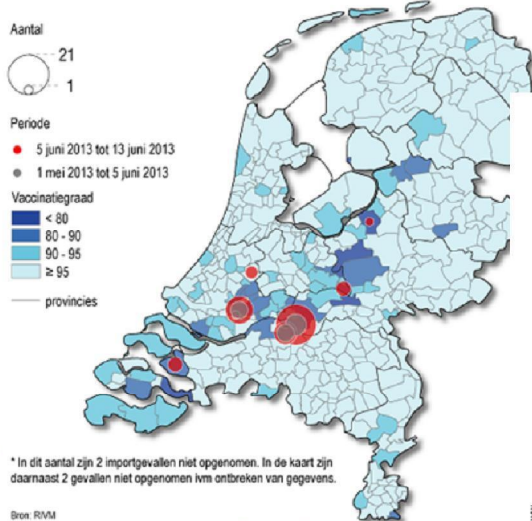
Figure: Measles basic reproduction number (R0), herd immunity, and coverage.

Guerra F et al. Lancet Inf Dis. Volume 17, 12, December 2017; 420-8.

Progression

* All unvaccinated, majority 4-12 yrs

Mazelen 1 mei 2013 tot 13 juni 2013
per gemeente, N = 64*



Acknowledgments: 5.1.2e, RIVM

National Outbreak Management Team 22

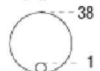
OMT Measles: June 17, 2013

- Risk assessment:
 - * 1,48% of the population accepting vaccination at risk
- Control measures
 - * Catch-up vaccination in the bible belt (proven not to be accepted)
 - * Extra MMR to children below 14 m (>6m)
- Policy in hospitals
- Research
- Monitoring perceptions



Mazelen 1 mei 2013 tot 25 juni 2013 per gemeente, N = 132*

Aantal



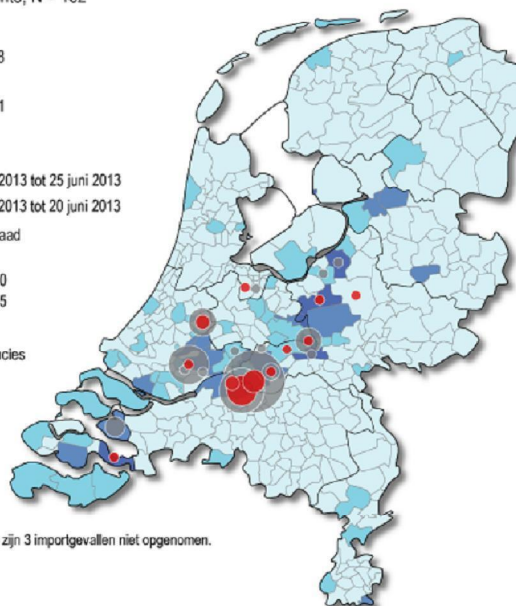
Periode

- 20 juni 2013 tot 25 juni 2013
- 1 mei 2013 tot 20 juni 2013

Vaccinatiegraad

- < 80
- 80 - 90
- 90 - 95
- ≥ 95

— provincies

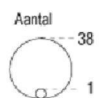


* In dit aantal zijn 3 importgevallen niet opgenomen.

Bron: RMM

www.zorgatlas.nl

Mazelen 1 mei 2013 tot 25 juni 2013 per gemeente, N = 132*



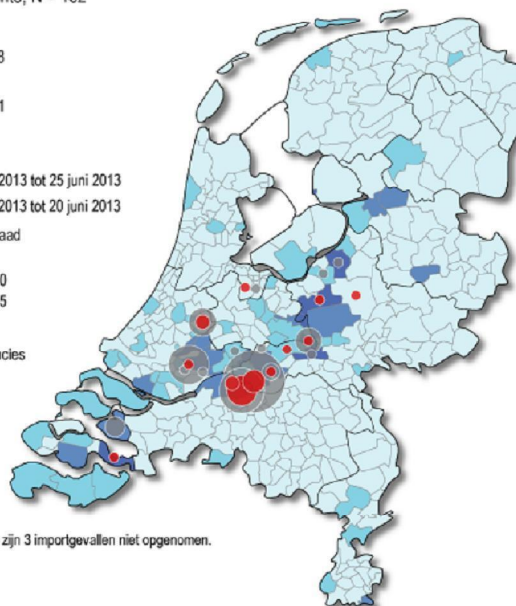
Periode

- 20 juni 2013 tot 25 juni 2013
- 1 mei 2013 tot 20 juni 2013

Vaccinatiegraad

- < 80
- 80 - 90
- 90 - 95
- ≥ 95

— provincies



* In dit aantal zijn 3 importgevallen niet opgenomen.

Bron: RMM

www.zorgatlas.nl

Mazelen 1 mei 2013 tot 25 juni 2013 per gemeente, N = 132*

Aantal



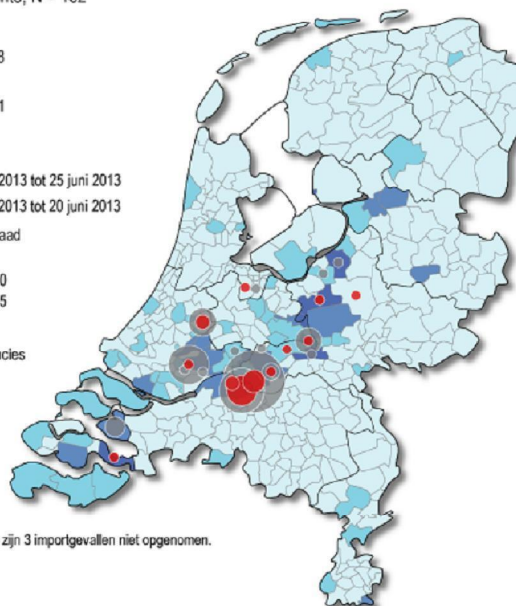
Periode

- 20 juni 2013 tot 25 juni 2013
- 1 mei 2013 tot 20 juni 2013

Vaccinatiegraad

- < 80
- 80 - 90
- 90 - 95
- ≥ 95

— provincies



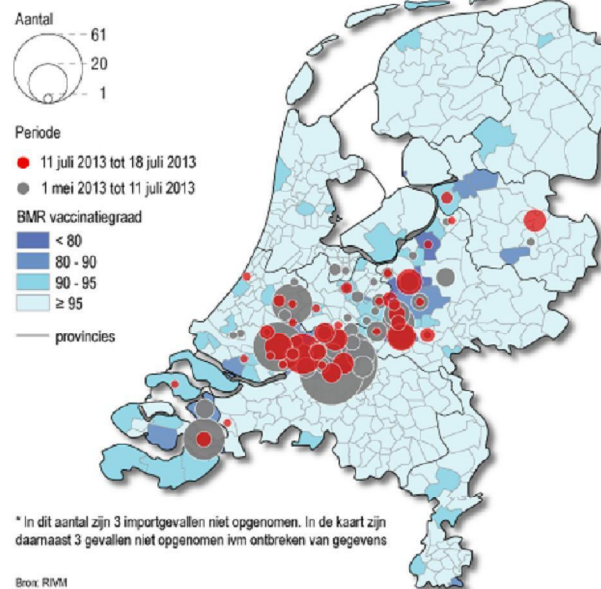
* In dit aantal zijn 3 importgevallen niet opgenomen.

Bron: RMM

www.zorgatlas.nl

Mazelen 1 mei 2013 tot 18 juli 2013

per gemeente, N = 466*



Mazelen 1 mei 2013 tot 31 juli 2013

per gemeente, N = 780*

Aantal



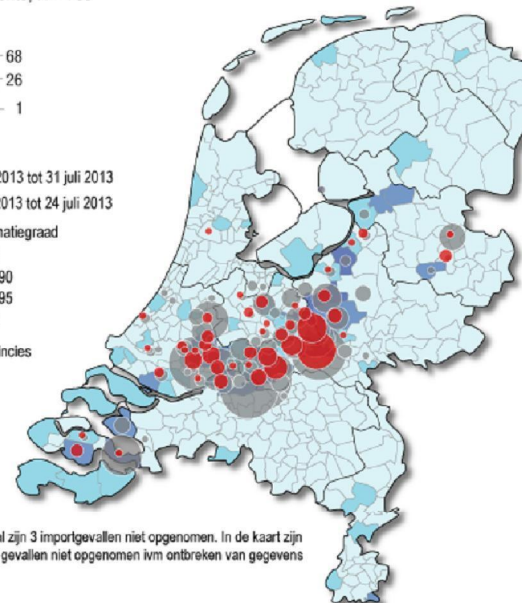
Periode

- 24 juli 2013 tot 31 juli 2013
- 1 mei 2013 tot 24 juli 2013

BMR vaccinatiegraad

- < 80
- 80 - 90
- 90 - 95
- ≥ 95

— provincies

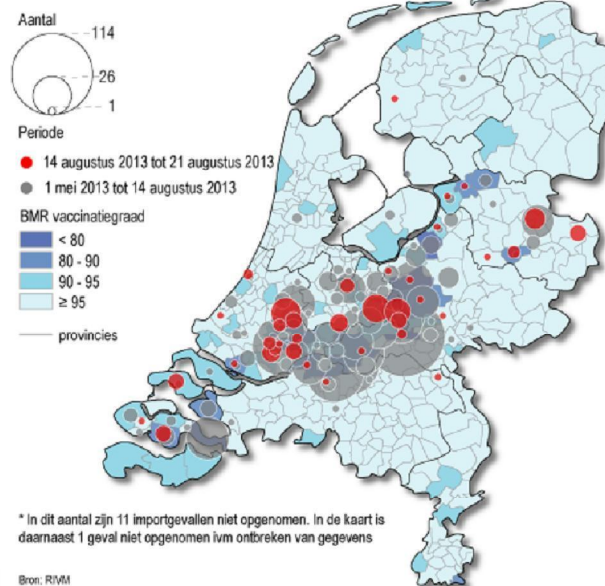


* In dit aantal zijn 3 importgevallen niet opgenomen. In de kaart zijn daarnaast 2 gevallen niet opgenomen ivm ontbreken van gegevens

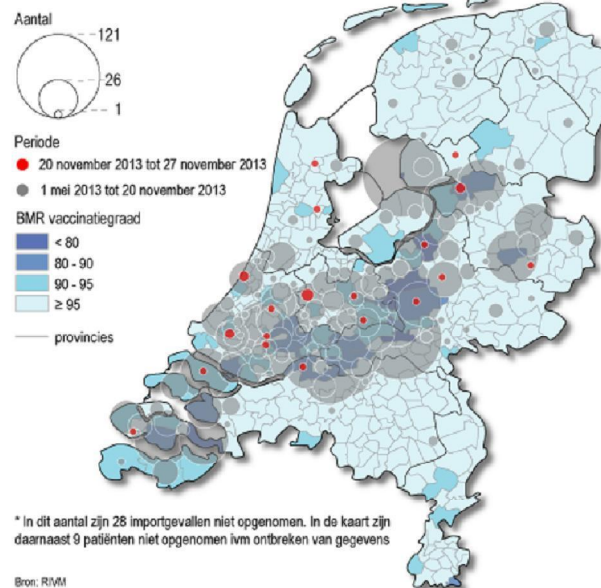
Bron: RMM

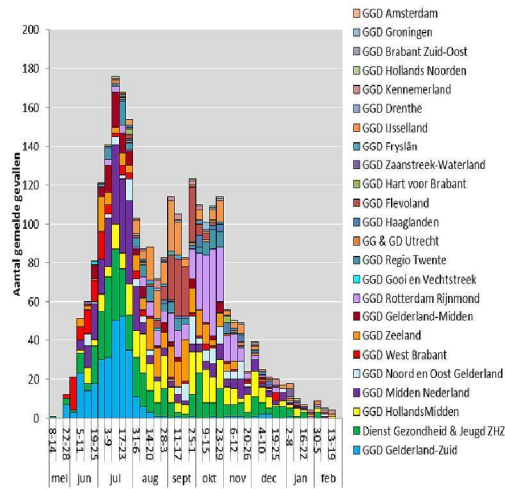
www.zorgatlas.nl

Mazelen 1 mei 2013 tot 21 augustus 2013 per gemeente, N = 1.162*

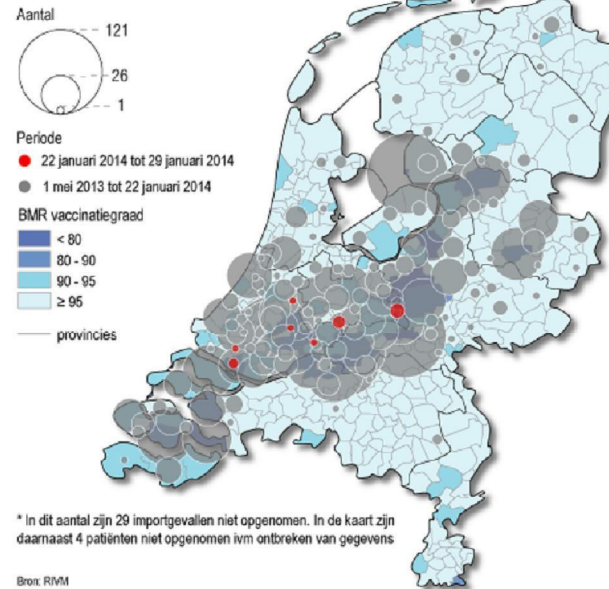


Mazelen 1 mei 2013 tot 27 november 2013 per gemeente, N = 2.405*

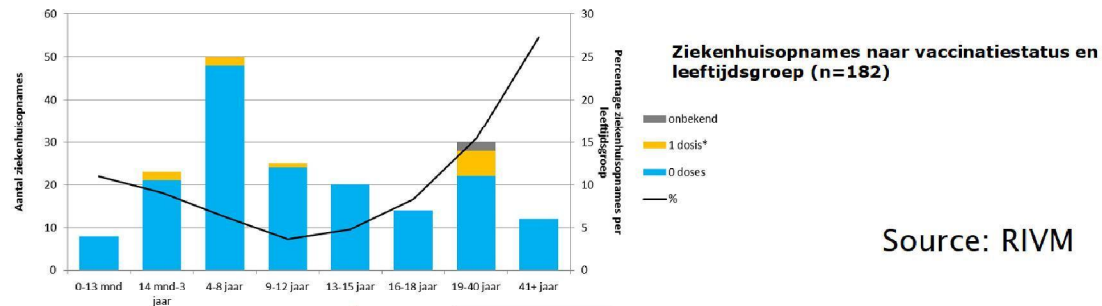
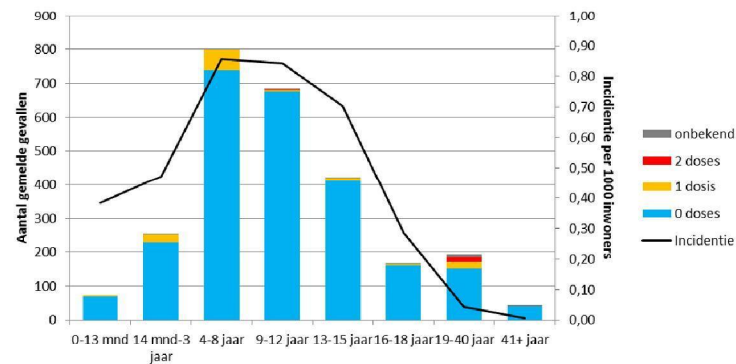




Mazelen 1 mei 2013 tot 29 januari 2014 per gemeente, N = 2.606*



Mazelenmeldingen en opnames naar vaccinatiestatus en leeftijdsgroep



Source: RIVM

Notified complications due to measles outbreak 2013–2014

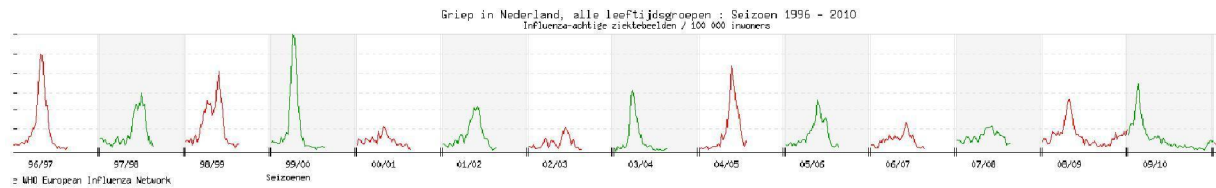
	Totaal aantal gemelde patiënten met complicatie(s)		Totaal aantal gemelde patiënten met complicatie(s) opgenomen (geweest) in het ziekenhuis	
	Aantal	% van alle gemelde patiënten met mazelen	Aantal	% van gemelde patiënten met complicatie(s)
	1	0.04%	1	100%
	1	0.04%	1	100%
	1	0.04%	1	100%
	151	5.7%	79	52%
	106	4.0%	5	5%
	5	0.2%	4	80%
	19	0.7%	17	90%
	16	0.6%	5	31%
	22	0.9%	16	73%
			47	
			6	
	322	12.2%	182	57%

Severe outcome: 1 died during measles, 1 due to late complications, 1 in nursing home

The other pandemic (flu pandemic 2009)

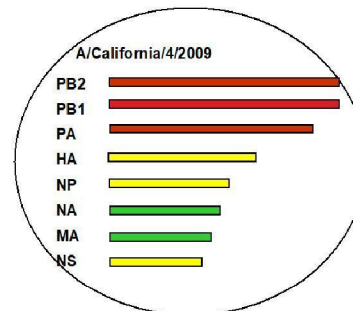
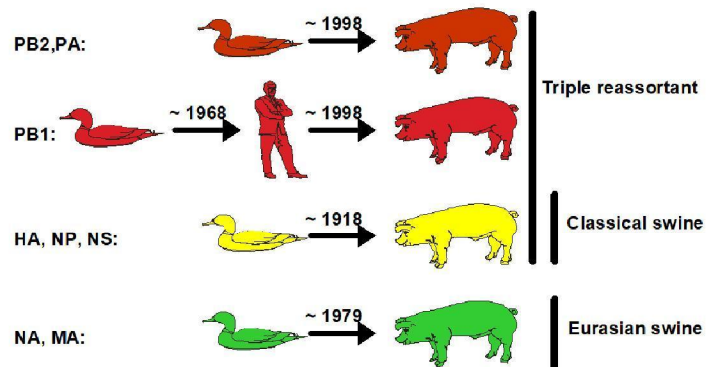


Seasonal influenza throughout the past decade



BRON: NIVEL

New virus: combination of genes from 4 viruses



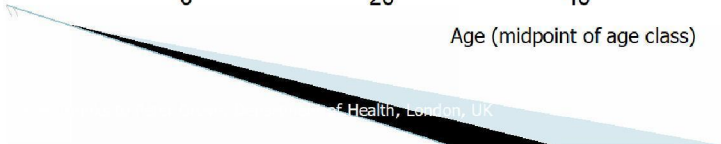
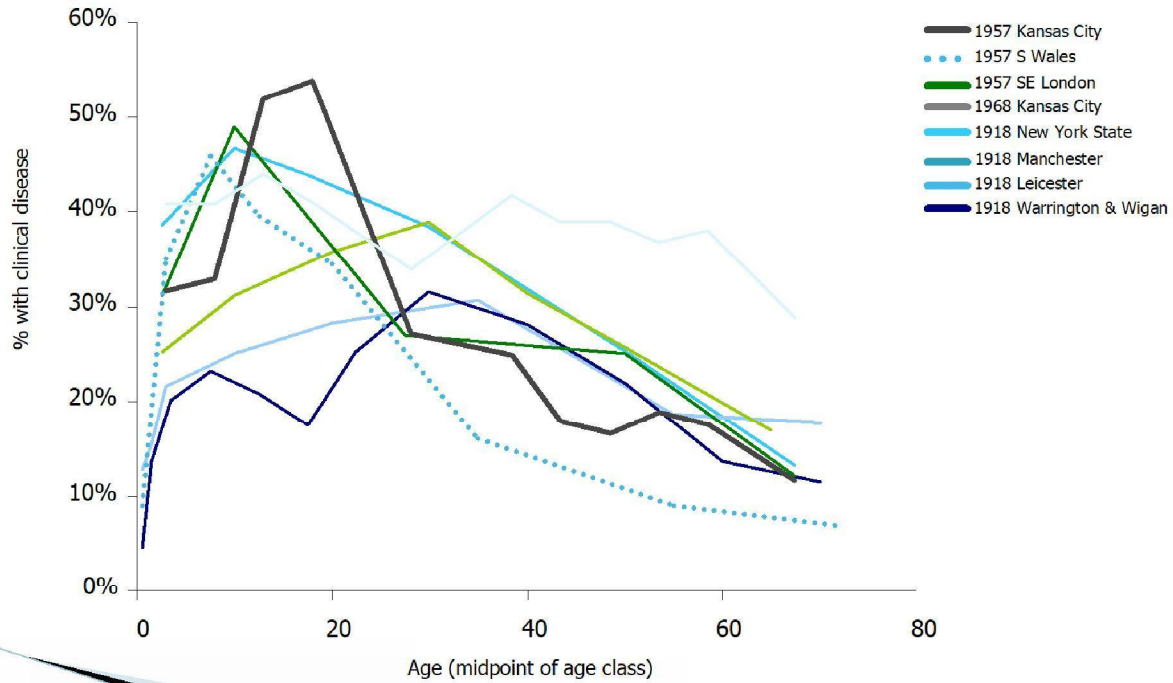
Novel Swine-Origin Influenza A (H1N1) Virus Investigation Team*, New England Journal of Medicine, 2009

Some of the 'known unknowns' in
the 20th century pandemics

- * Three pandemics (1918, 1957, 1968)
- * Different shapes and waves
- * Differences in effective reproductive number
- * Different groups affected
- * Different levels of severity including case fatality ratio
- * Imply different approaches to mitigation

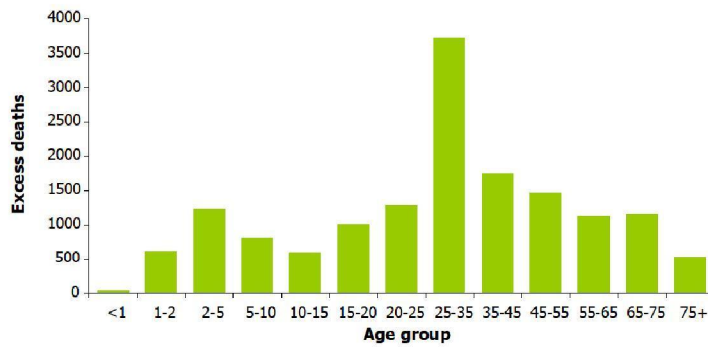
• New virus
• Efficient person-to-person transmission
• Significant disease
• No previous immunity
Worldwide spread

Age-specific clinical attack rate in previous pandemics

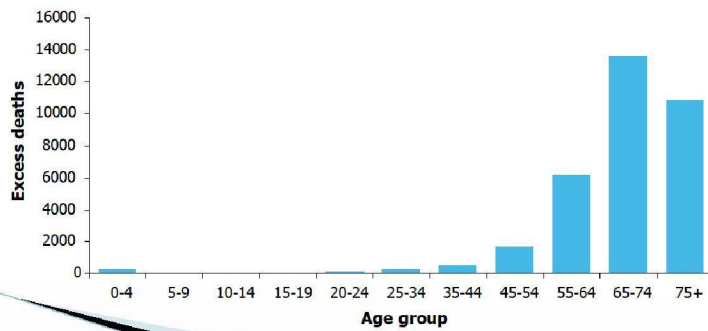


of Health, London, UK

Different age-specific excess deaths in pandemics

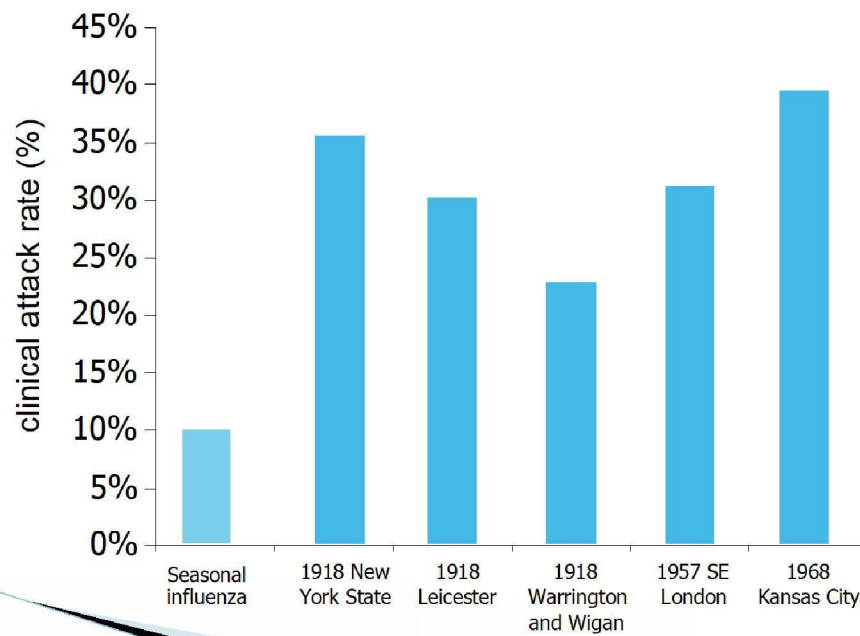


Excess deaths, second wave, 1918 epidemic

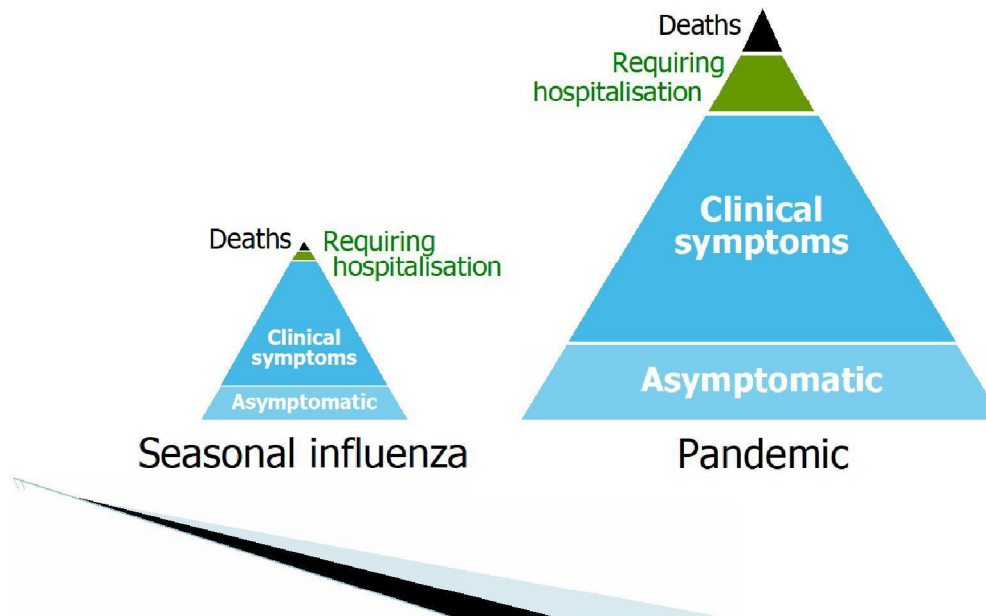


Excess deaths second wave 1969 pandemic, England and Wales

Numbers affected in seasonal influenza epidemics and pandemics (overall clinical attack rate in previous pandemics)



Seasonal influenza compared to pandemic — proportions of types of cases



Country, territory and area	New cases since previous update	Cumulative total
United Kingdom of Great Britain and Northern Ireland	0	
United Kingdom, Isle of Man, Crown Dependency	0	
United Kingdom, Jersey, Crown Dependency	0	
United States of America	20	
Uruguay	0	
Vanuatu	0	
Venezuela (Bolivarian Republic of)	0	
Viet Nam	0	
West Bank and Gaza Strip	0	
Yemen	0	
{Grand Total}	38	

GMT
 GMT
 GMT
 GMT+1
 GMT
 GMT
 GMT
 GMT

Cumulative	
0	0
38	38

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

Tragao: 3
Three confirmed cases of a cruise



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

Country, territory and area	New cases since previous update	Cumulative total
United Kingdom of Great Britain and Northern Ireland	3	
United Kingdom, Isle of Man, Crown Dependency	0	
United Kingdom, Jersey, Crown Dependency	0	
United States of America	18	
Uruguay	0	
Vanuatu	0	
Venezuela (Bolivarian Republic of)	0	
Viet Nam	0	
West Bank and Gaza Strip	0	
Yemen	0	
{Grand Total}	109	

- GMT
- GMT
- GMT
- GMT+1
- GMT
- GMT**
- GMT
- GMT

Cumulative	
0	8
109	257

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

Tragao: 3
Three confirmed cases of a cruise



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

Country, territory and area	New cases since previous update	Cumulative total
United Kingdom of Great Britain and Northern Ireland	66	
United Kingdom, Isle of Man, Crown Dependency	0	
United Kingdom, Jersey, Crown Dependency	0	
United States of America	1163	
Uruguay	2	
Vanuatu	0	
Venezuela (Bolivarian Republic of)	0	
Viet Nam	0	
West Bank and Gaza Strip	0	
Yemen	0	
{Grand Total}	2112	

- GMT
- GMT
- GMT
- GMT
- GMT
- GMT
- GMT
- GMT
- GMT
- GMT
- GMT

Cumulative	
4	99
112	15510

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

Tragao: 3 three confirmed cases of a cruise



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

Country, territory and area	New cases since previous update	Cumulative total
United Kingdom of Great Britain and Northern Ireland	156	
United Kingdom, Isle of Man, Crown Dependency	0	
United Kingdom, Jersey, Crown Dependency	0	
United States of America	0	
Uruguay	0	
Vanuatu	0	
Venezuela (Bolivarian Republic of)	1	
Viet Nam	1	
West Bank and Gaza Strip	0	
Yemen	0	
{Grand Total}	1037	

- reports
- GMT
- GMT
- GMT
- GMT
- GMT
- GMT
- GMT
- GMT
- GMT

Cumulative	
3	144
37	28774

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

Tragao: 3 three confirmed cases of a cruise



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

Country, territory and area	New cases since previous update	Cumulative total
United Kingdom of Great Britain and Northern Ireland	692	
United Kingdom, Isle of Man, Crown Dependency	0	
United Kingdom, Jersey, Crown Dependency	5	
United States of America	0	
Uruguay	0	
Vanuatu	1	
Venezuela (Bolivarian Republic of)	18	
Viet Nam	7	
West Bank and Gaza Strip	1	
Yemen	0	
{Grand Total}	3947	

- GMT
- GMT
- GMT
- GMT
- GMT
- GMT
- GMT
- GMT
- GMT
- GMT

Cumulative	
25	263
947	59814

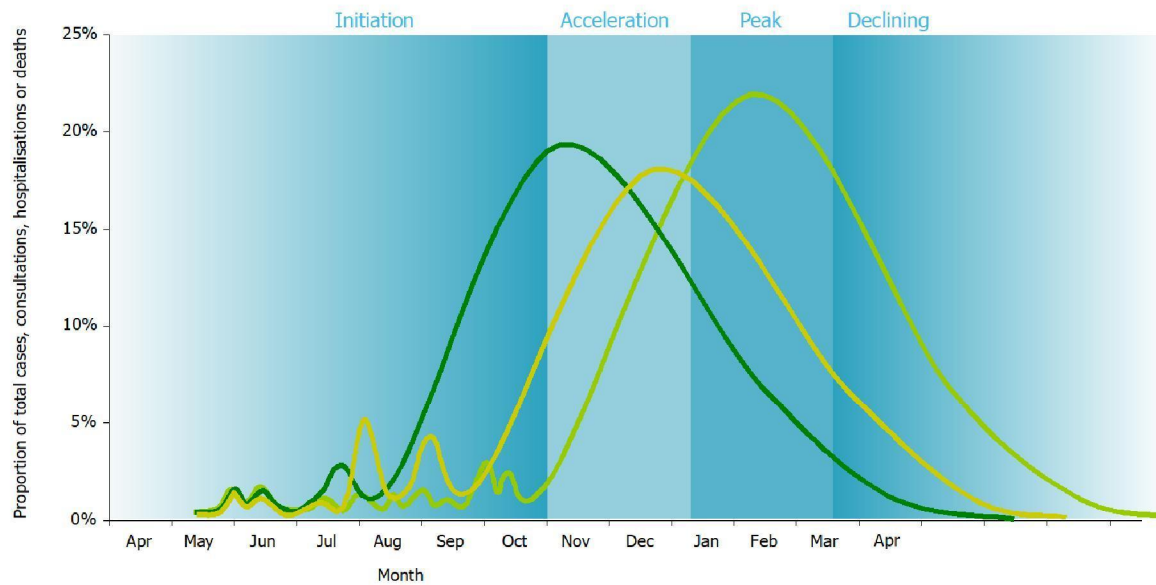
Chinese Taipei has cases of 0 deaths. Cases are included in the table in the table

Tragao: 3 three confirmed cases of a cruise



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

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

Which interventions for containment or mitigation?

Vaccination with
pandemic vaccine
(adjuvated)

Social distancing,
cough hygiene

Antivirals

Vaccines

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

HPV catch-up campaign spring 2009: coverage 50% rather than targeted 70%: strong anti-vaccination lobby

Scepticism whether pandemic vaccination needed ('mild pandemic')

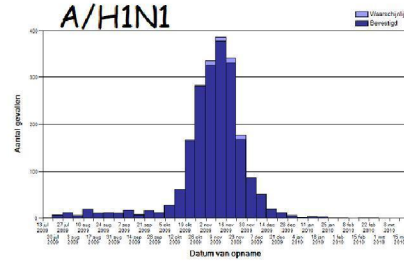
Anxiety about new vaccines not tested thoroughly for safety or effectiveness

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

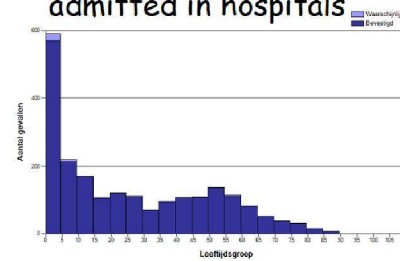
Discussions about role of pharmaceutical lobby in scientific advisory committees



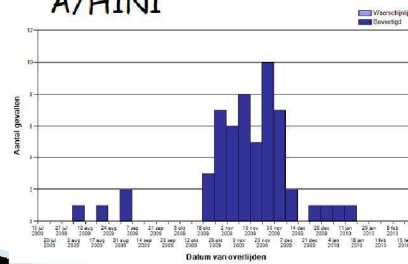
Hospital admissions due to A/H1N1



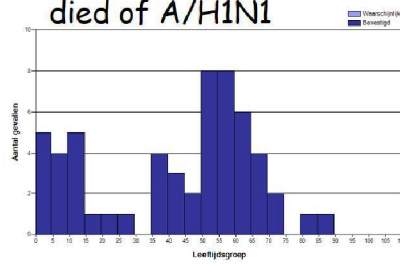
Age distribution of the patients admitted in hospitals



Deaths from A/H1N1



Age distribution of patients who died of A/H1N1



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)

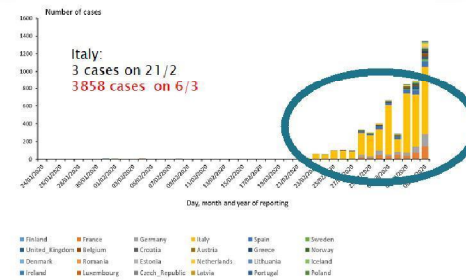
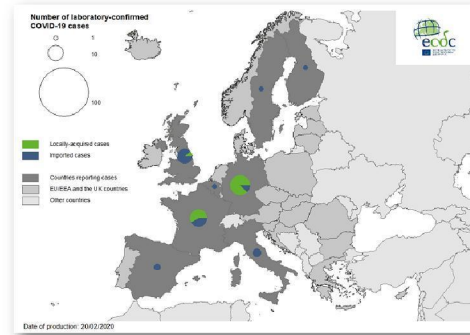
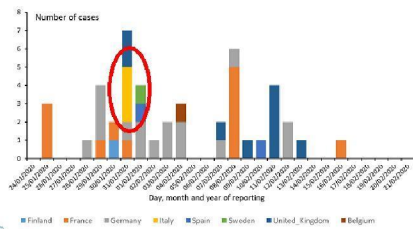
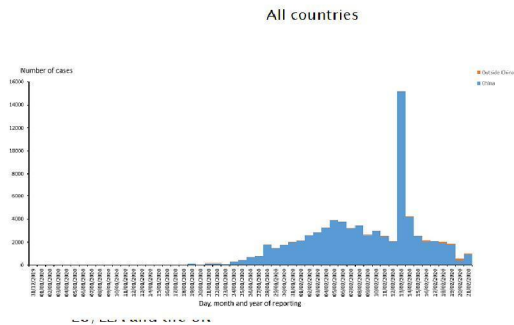
Source:
RIVM

COVID- 19 in retrospect

The first wave



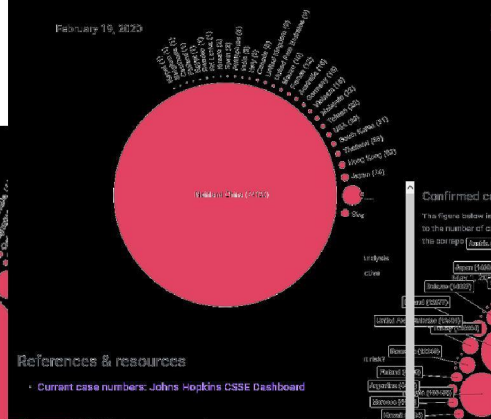
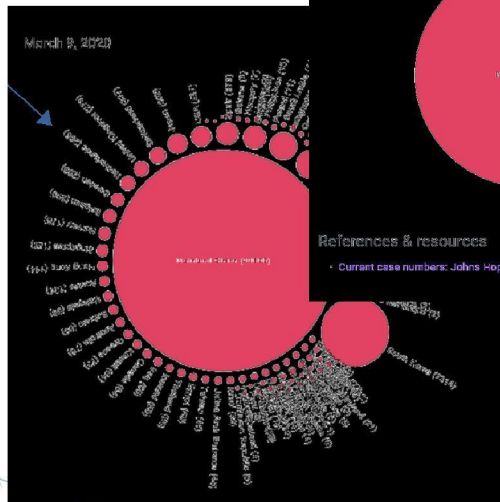
Distribution of COVID-19 cases (according to the applied case definition in the country) by country and region, as of 21 February 2020



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

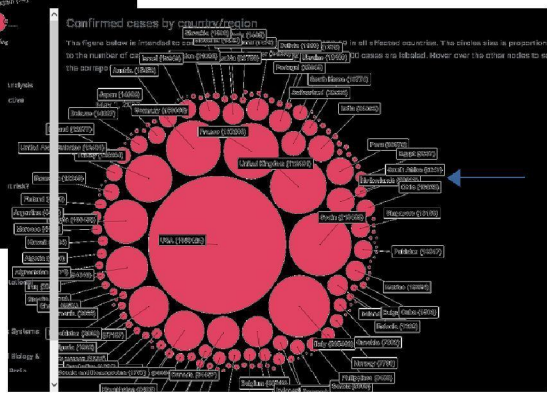
The figure below is intended to convey the magnitude of impact of COVID-19 in each/else China compared to other countries. Each affected country is depicted by a pink circle proportional to the number of cases confirmed in that country.



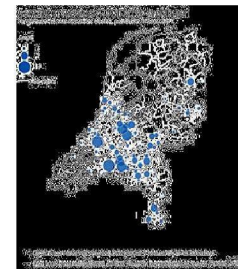
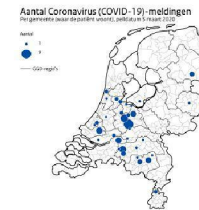
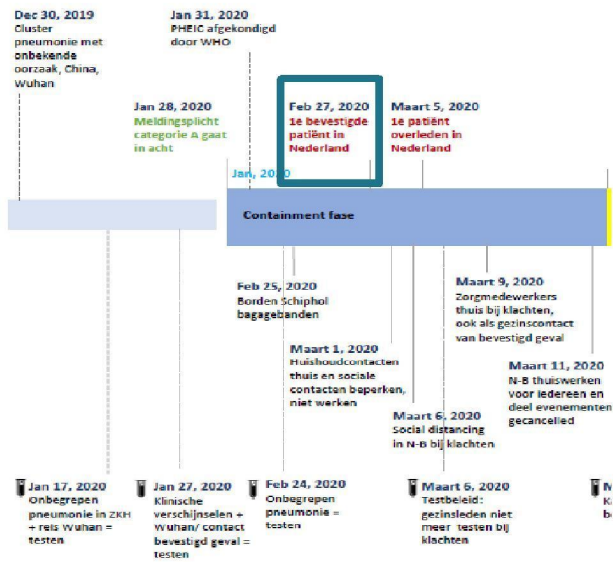
References & resources
- Current case numbers: Johns Hopkins CSSE Dashboard

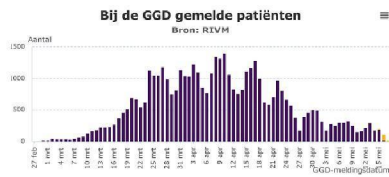
RKI (http://rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus.html)

May 1, 2020

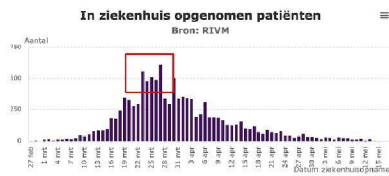


What happened in the Netherlands?

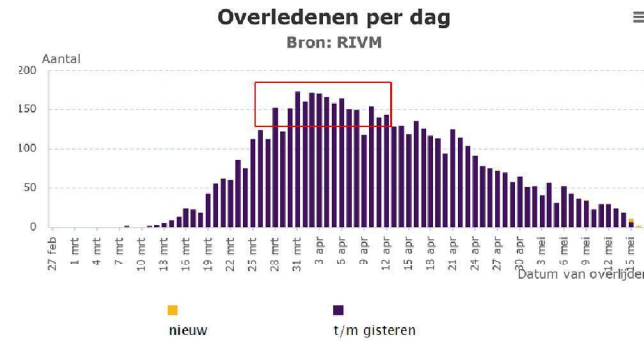




17/05
43.995



17/05
11.552
Mediaan: 69 jaar

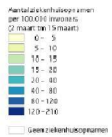


17/05
5.680
Mediaan: 82 jaar



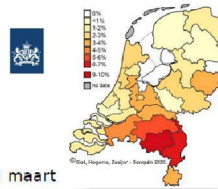
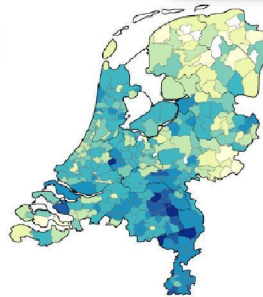
COVID-19 uitbraak ziekenhuisopnames per 2 weken

2-15 maart



RIVM - Technische briefing Tweede Kamer Jaap van Dissel - 22 april 2020

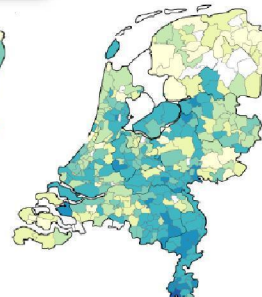
16-29 maart



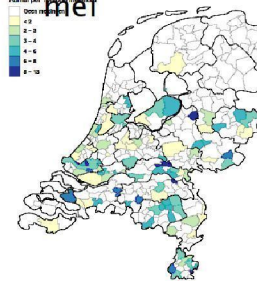
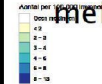
Seroprevalentie antistoffen
Dank: 5.12e Sanquin

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

30 maart - 12 april

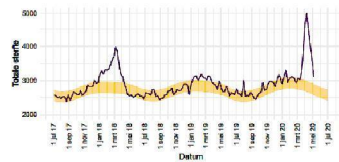
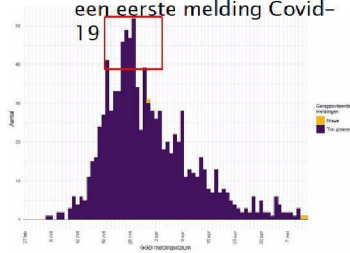


3 mei - 16 mei



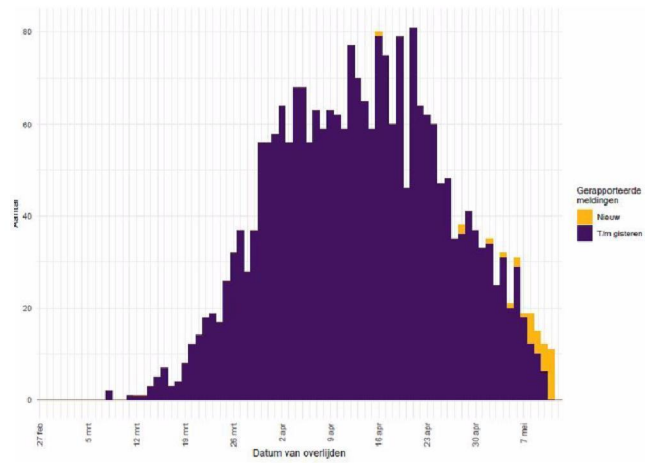
3

Nieuwe verpleeghuislocaties met een eerste melding Covid-19



oversterfte

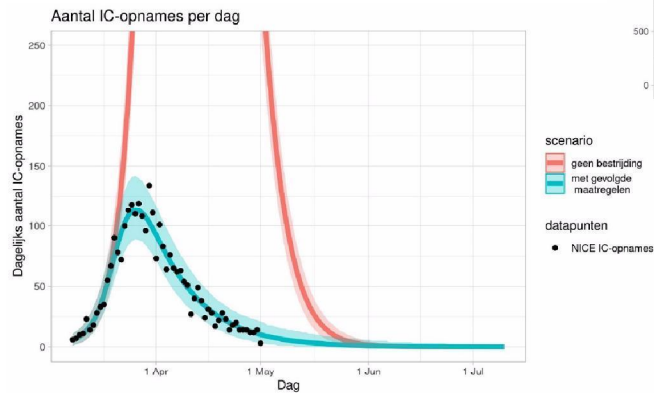
Overleden patiënten die in een verpleeghuis wonen, per dag



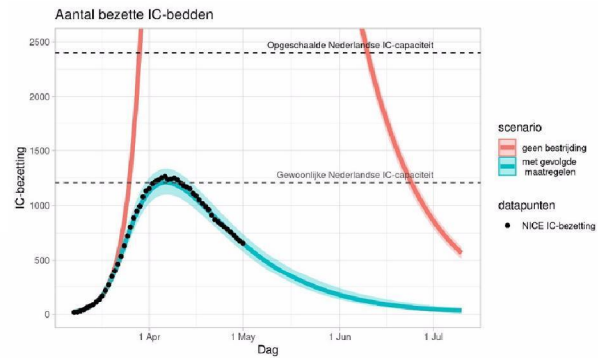
Bronnen: RIVM, CBS, VERENSO, NIVEL



Nieuwe IC-opnames van patiënten met COVID-19



gegevens in figuur niet gecorrigeerd voor rapportagevertraging

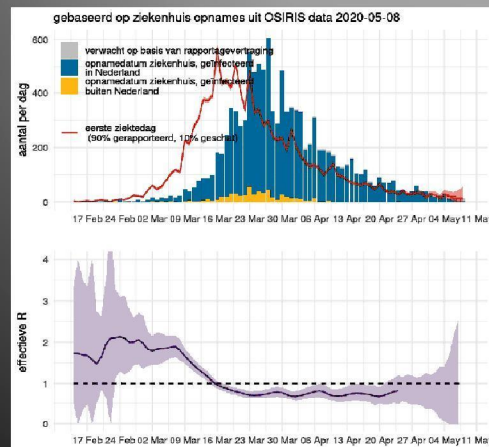


Bezette IC-plaatsen door patiënten met COVID-19

Bron: EPI/RIVM

Dank: 5.1.2e

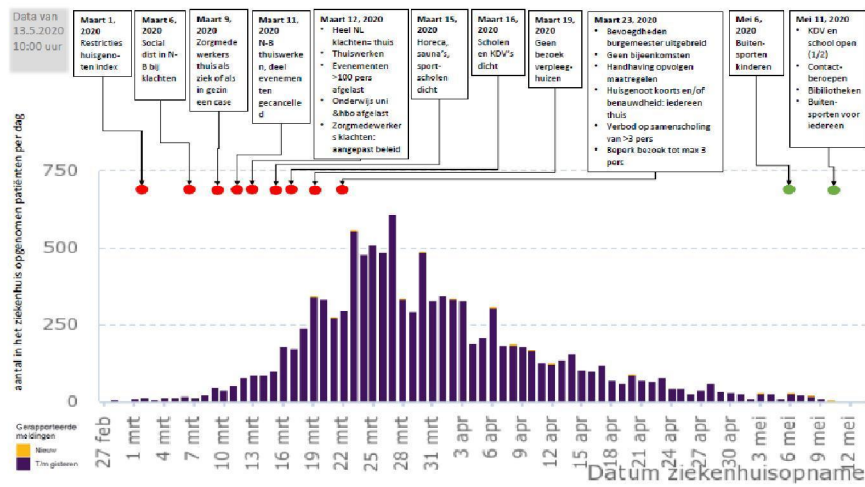
Indicator for transmission: basic reproduction number (R_0)



- OSIRIS
- **Blauw**: aantal meldingen ziekenhuisopname naar opnamedatum
- **Grijs**: verwachte meldingen (correctie voor rapportagevertraging)
- **Rood**: aantal ziekenhuisopnames naar eerste ziektedag
- 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: 5.1.2e



Bron: LCI; met dank aan 5.1.2e

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
	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

From: WHO Euro,
2 April, cor

Results – Dates of NPI implementation

WHO Euro

Category	Educational institutions	Mass gathering				Cordon sanitaire	
	Schools	Shops	Restauration	Culture	Sports	Blanket restrictions	Border control
	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	
	11	10	11	11	11	9	7

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

Bron: WHO EURO
2 april

Blanket restrictions*: considered when gatherings of >5 people prohibited

Strategy throughout the summer

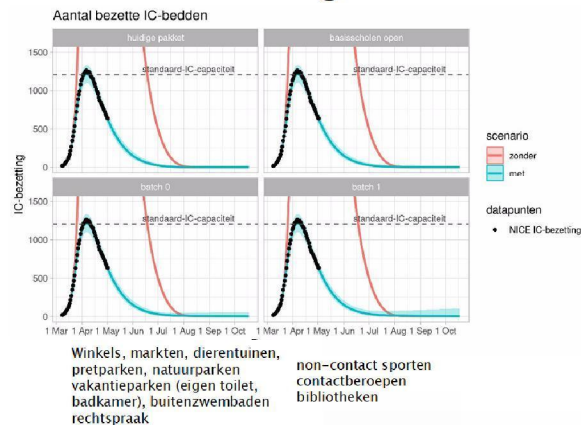
67

GOALS

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

RELAXATION OF THE MEASURES

* Modelling



Measures

- Hygienic measures
- Generic measures (1,5 m)
- Tele working
- Stay home when symptoms
- Testing
- Contact tracing

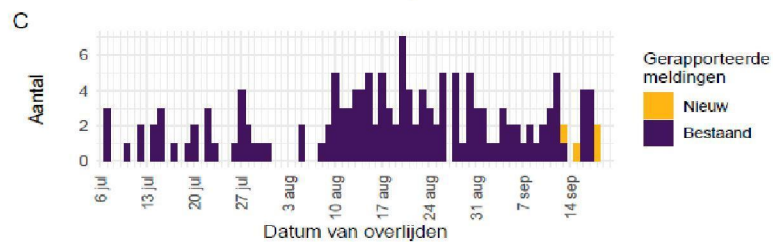
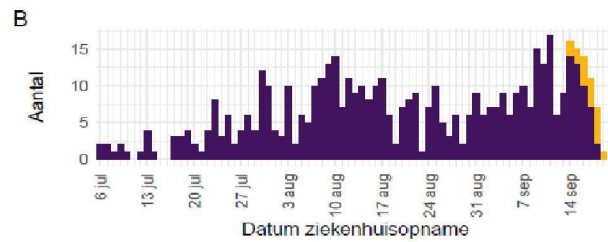
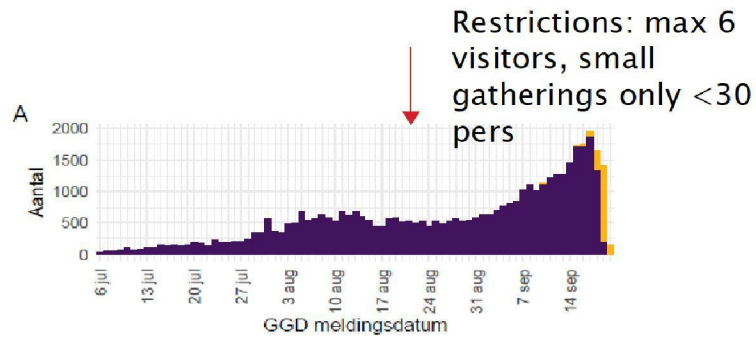
Monitoring

- Epidemiology, R_0
- Tests and performance indicators van effect contact tracing
- Mobility
- Compliance
- Seroprevalence (Pienter Corona, Sanquin)

Mei 2016

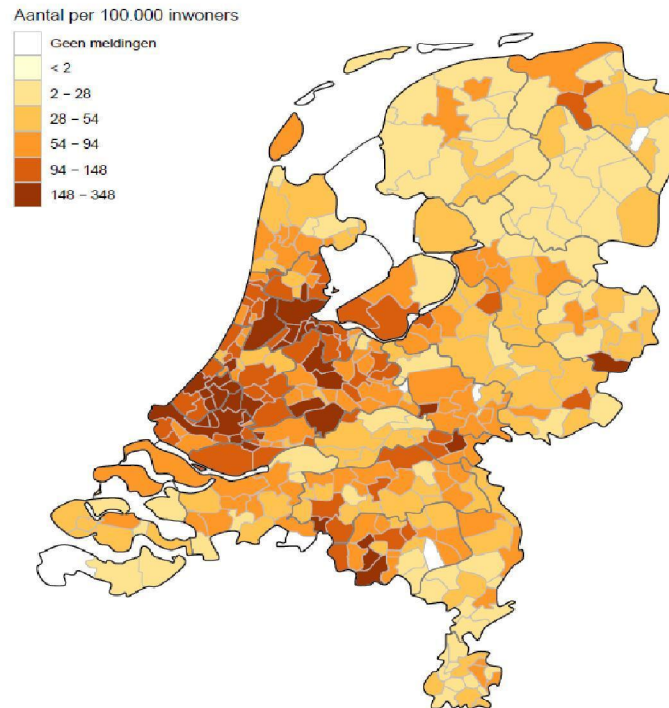
What has happened in the summer?





Covid-19 notifications, hospital admission and deaths July - Sept 18

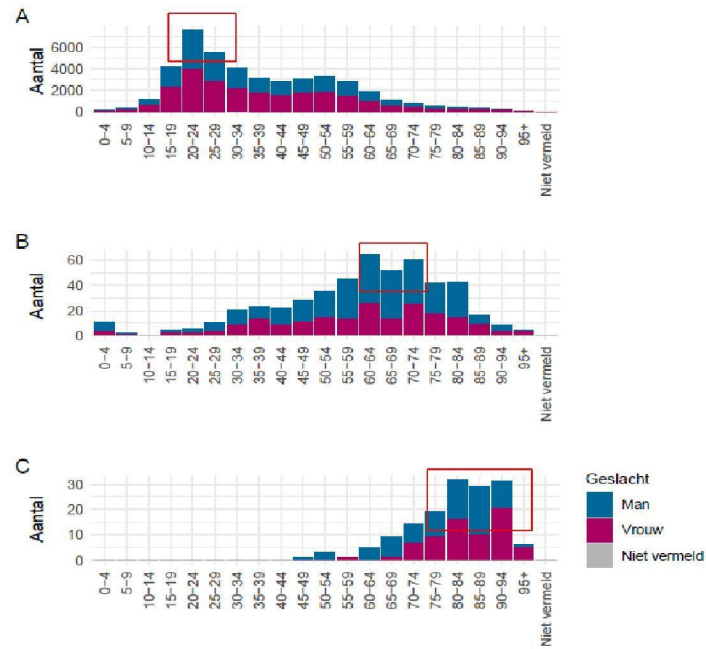
Source: RIVM



Covid-19 cases reported in
the past 2 weeks, as of Sept
20

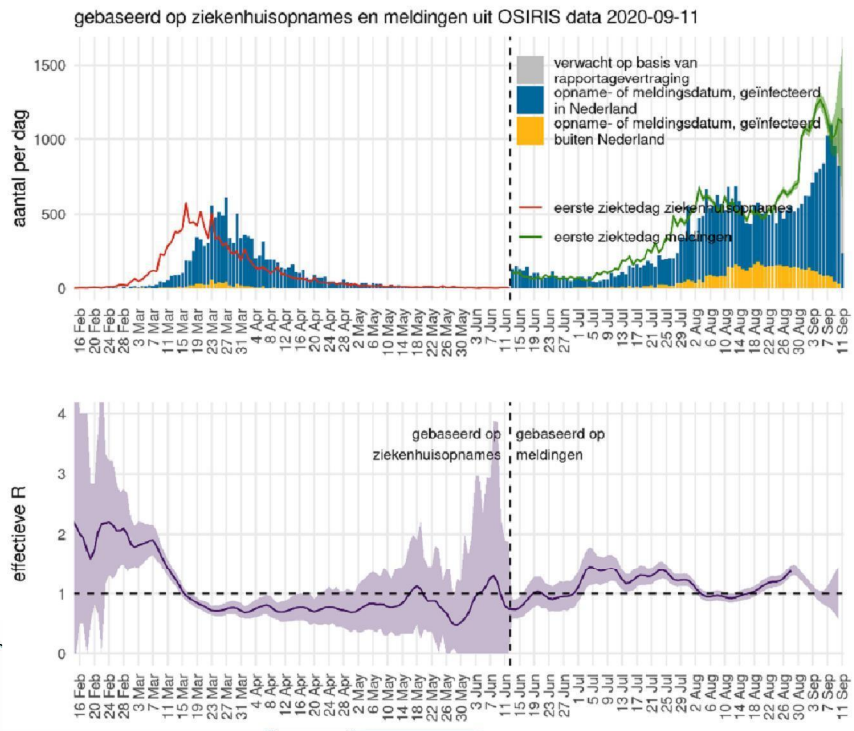
Source:
RIVM

Age distribution of new cases, hospitalizations and deaths July 6–Sept 20



Source: RIVM

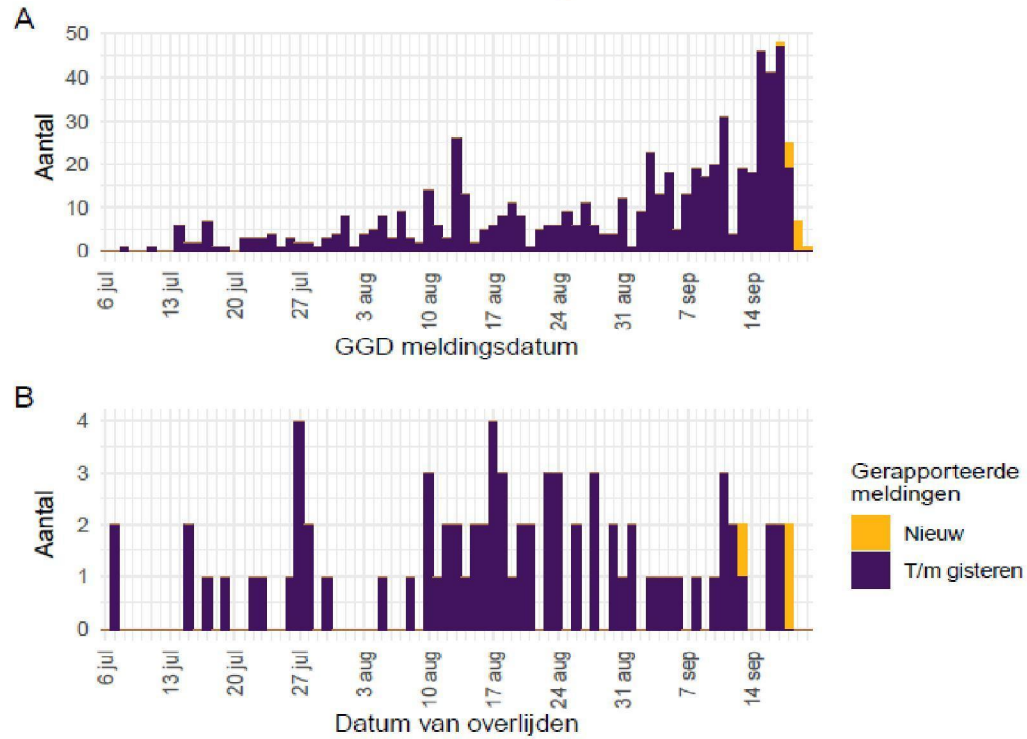
Indicator for transmission: basic reproduction number (R0), end of August



Source:
RIVM

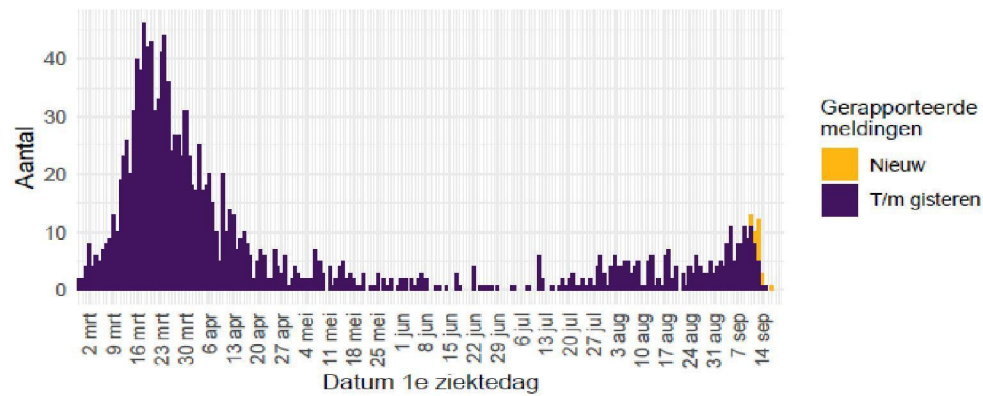
5.1.2e

Number of cases and deaths in nursing home patients



Source:
RIVM

Number of newly reported affected nursing homes

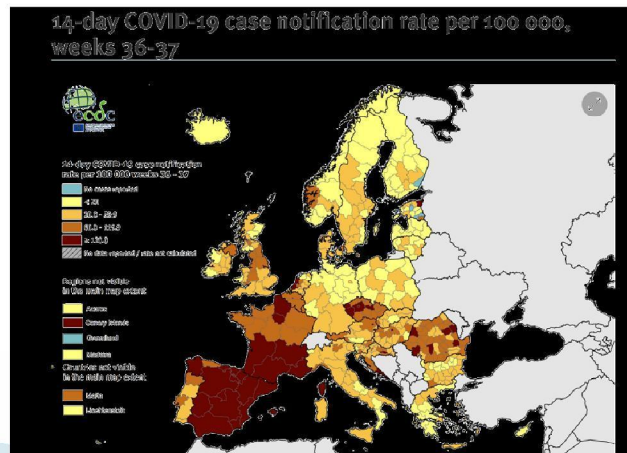
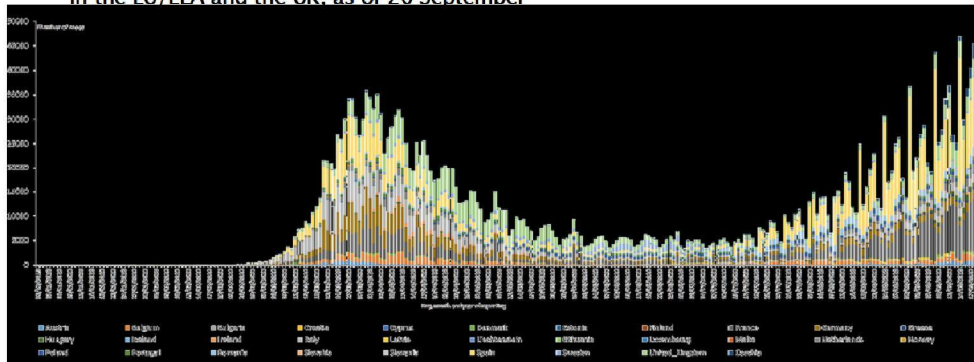


Source: RIVM



Distribution of laboratory confirmed cases of COVID-19 in the EU/EEA and the UK, as of 20 September

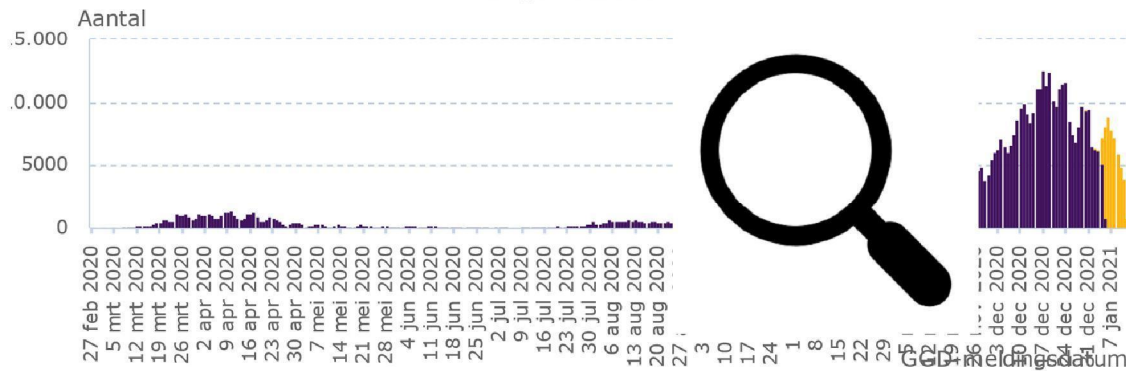
ecdc.europa.eu



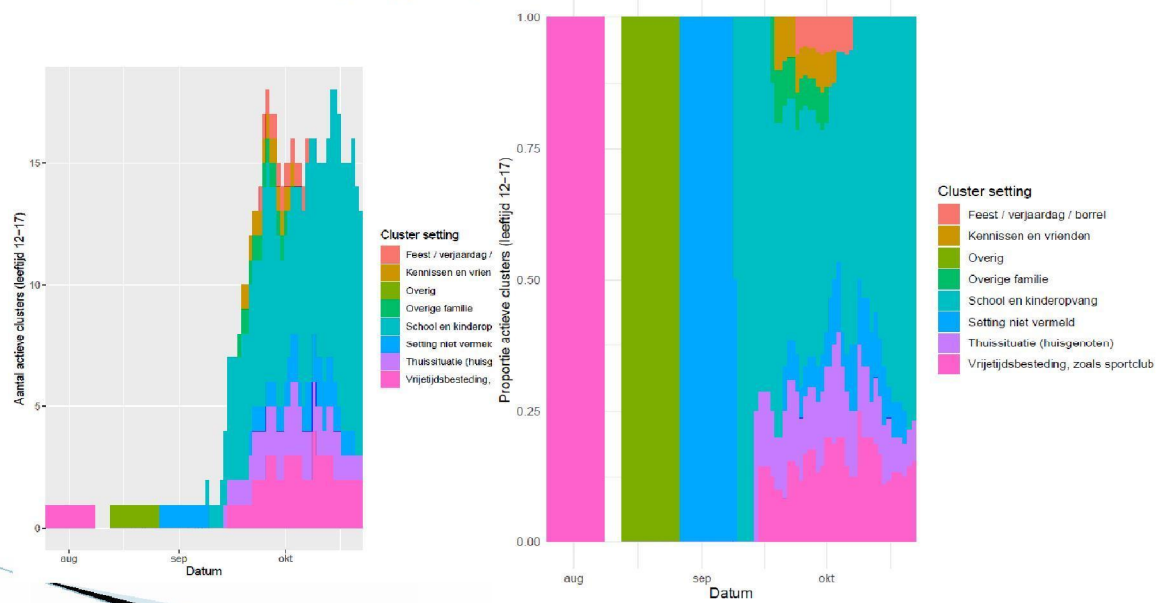
The second wave

Meldingen positief geteste personen per dag vanaf 27 feb 2020

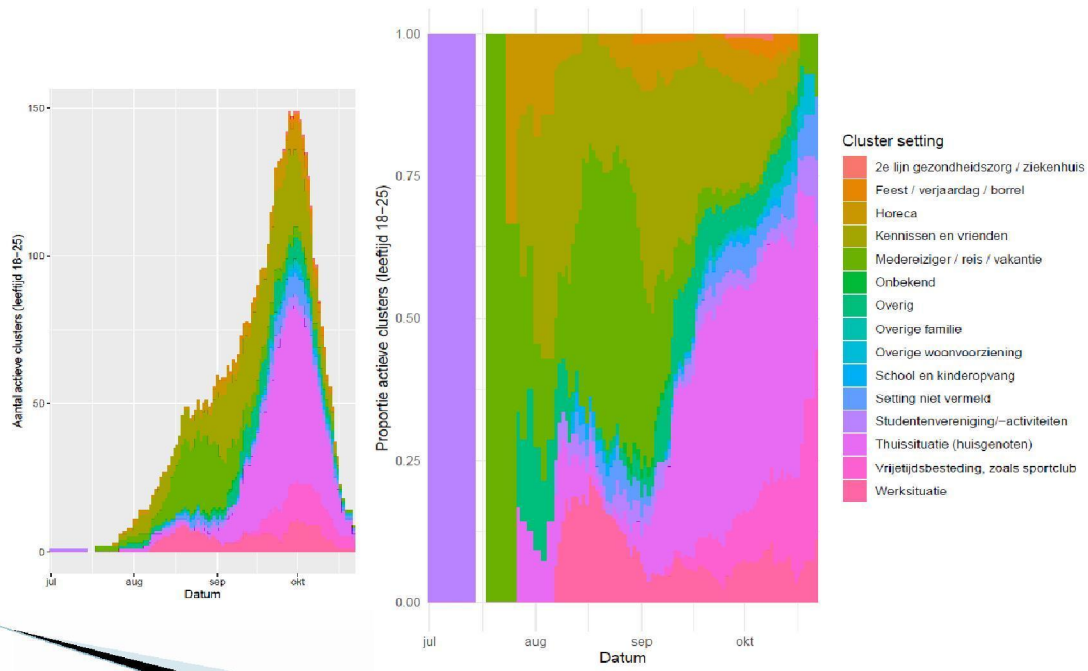
Bron: RIVM

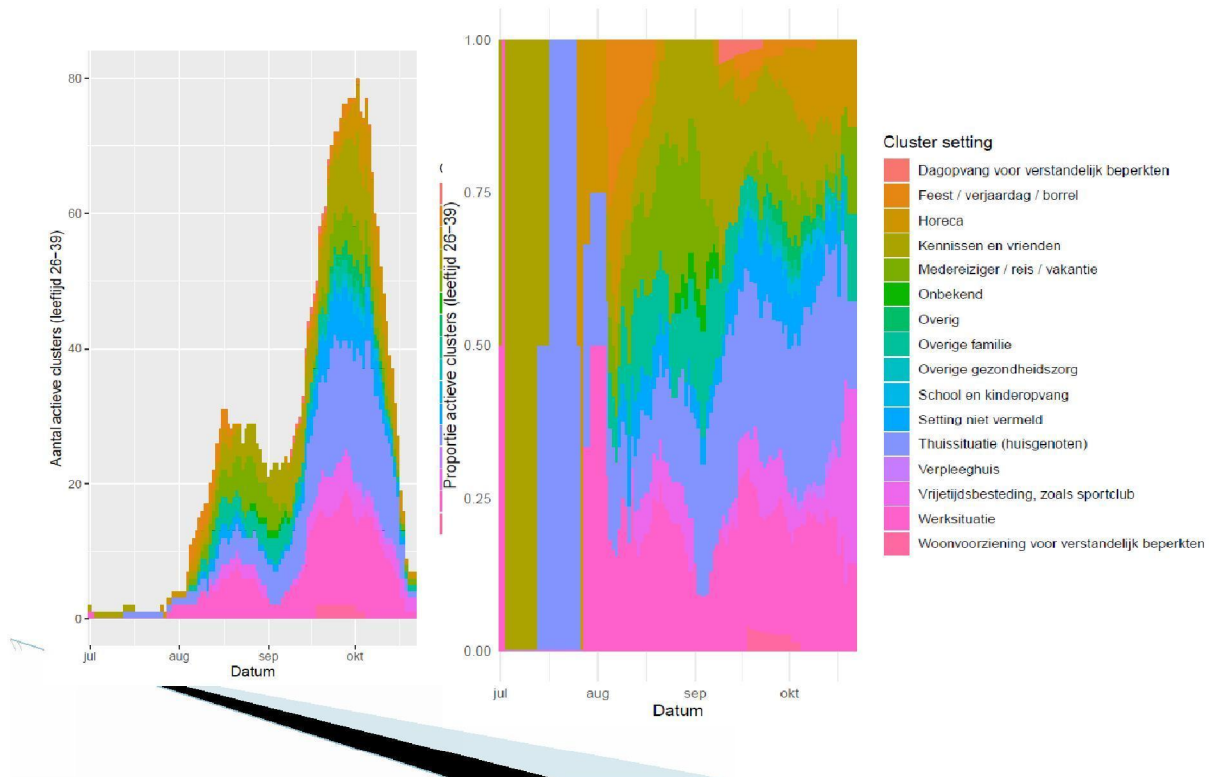


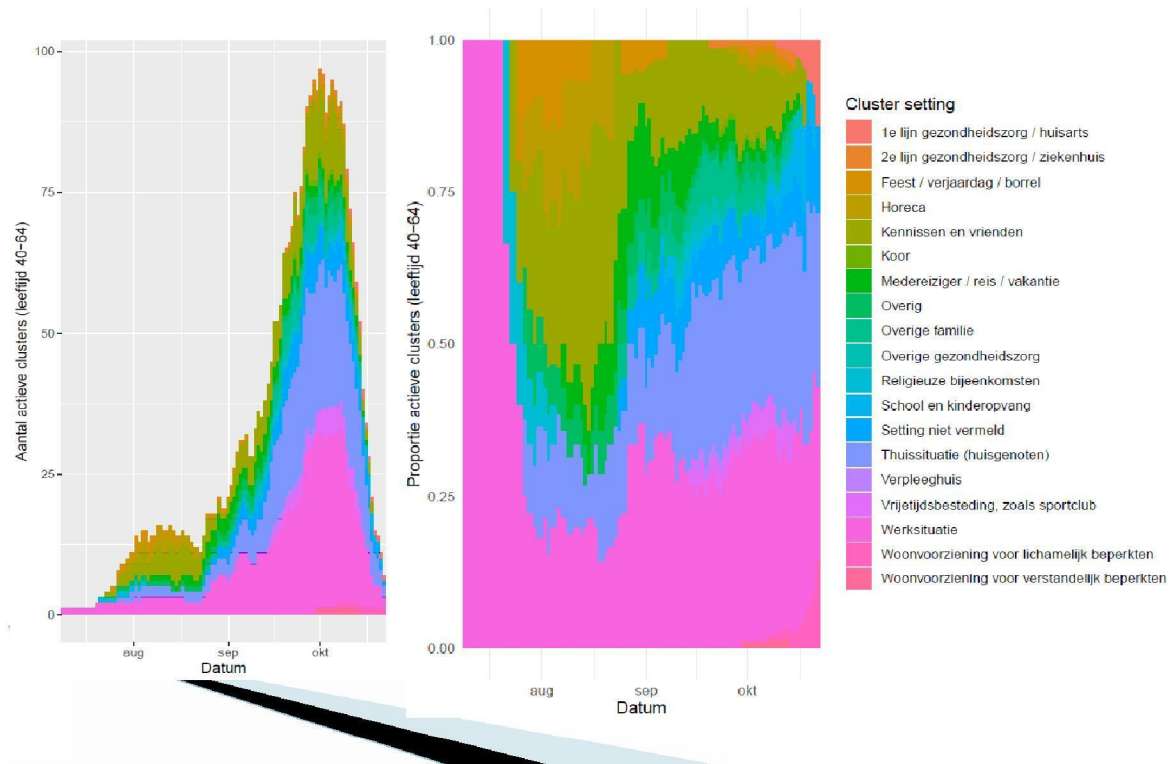
Meest geregistreerde settings bij clusters binnen leeftijdsgroepen

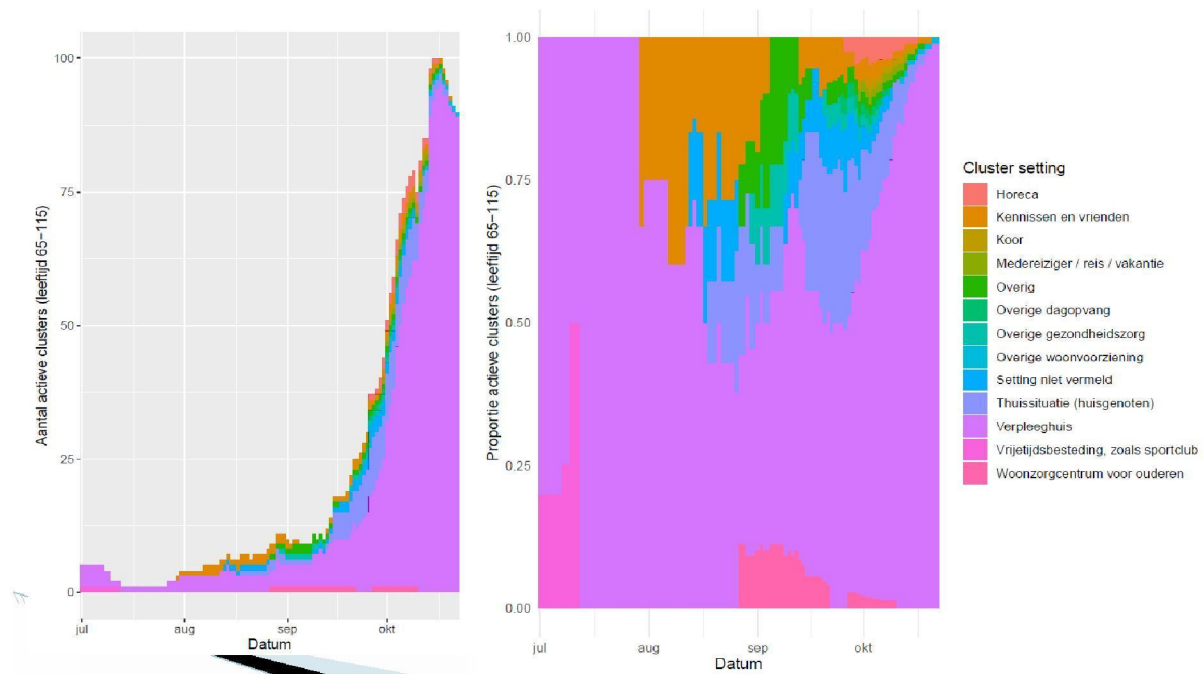


Bron: RIVM/Cib

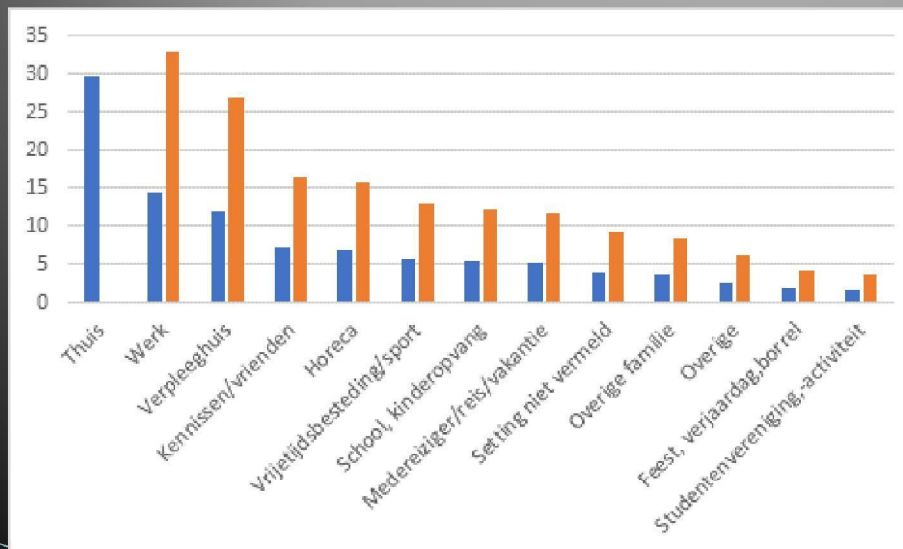








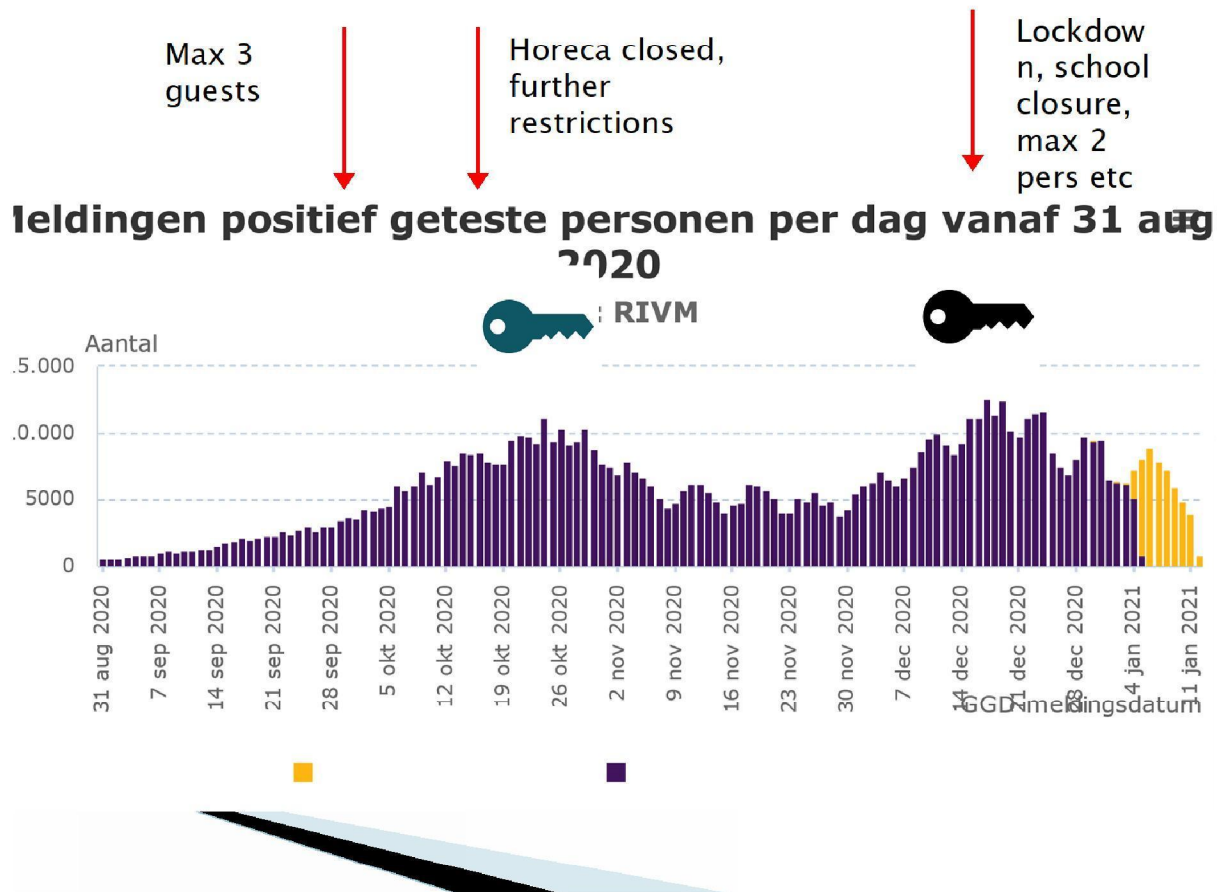
Clusters: aantallen en grootte – 19-10-2020



* Minder zicht
door
onvolledig BCO

Blauw: relatief aandeel verschillende clusters
Oranje: exclusief thuisituatie

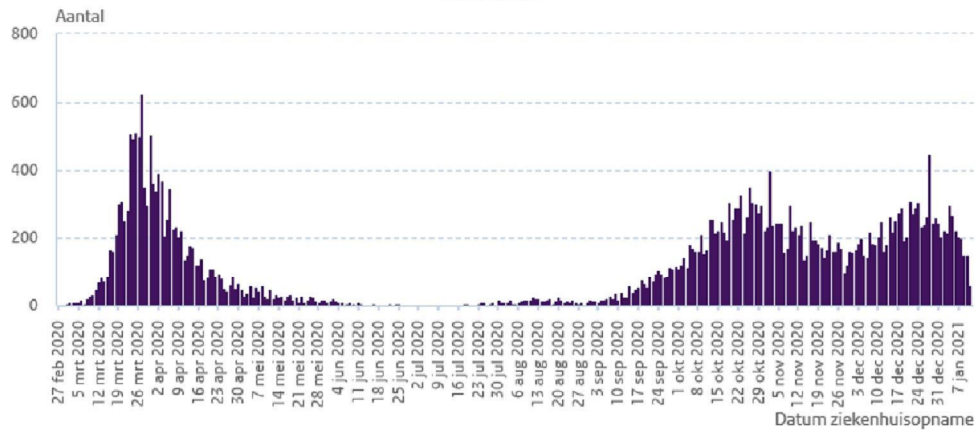
Bron: RIVM/Cib



In ziekenhuis opgenomen patiënten vanaf 27 februari 2020

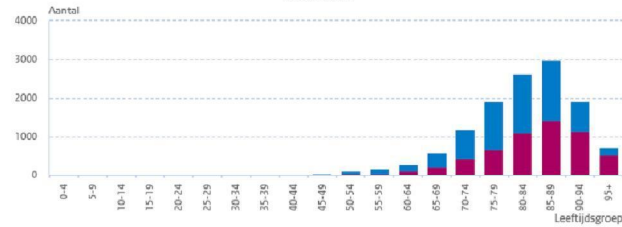


Bron: NICE



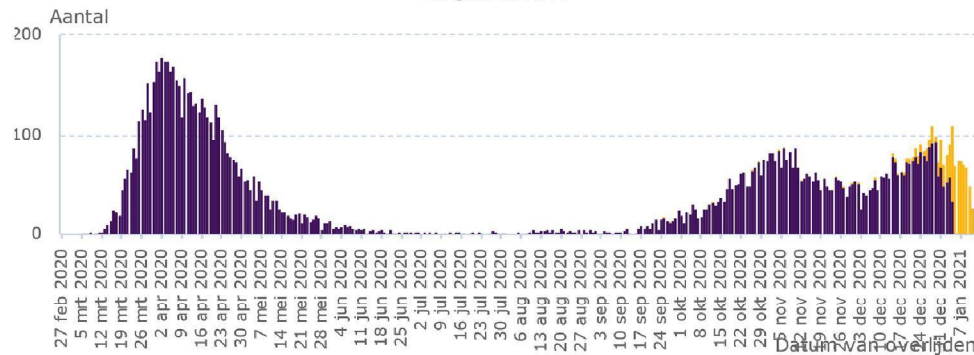
Leeftijd en geslacht overledenen

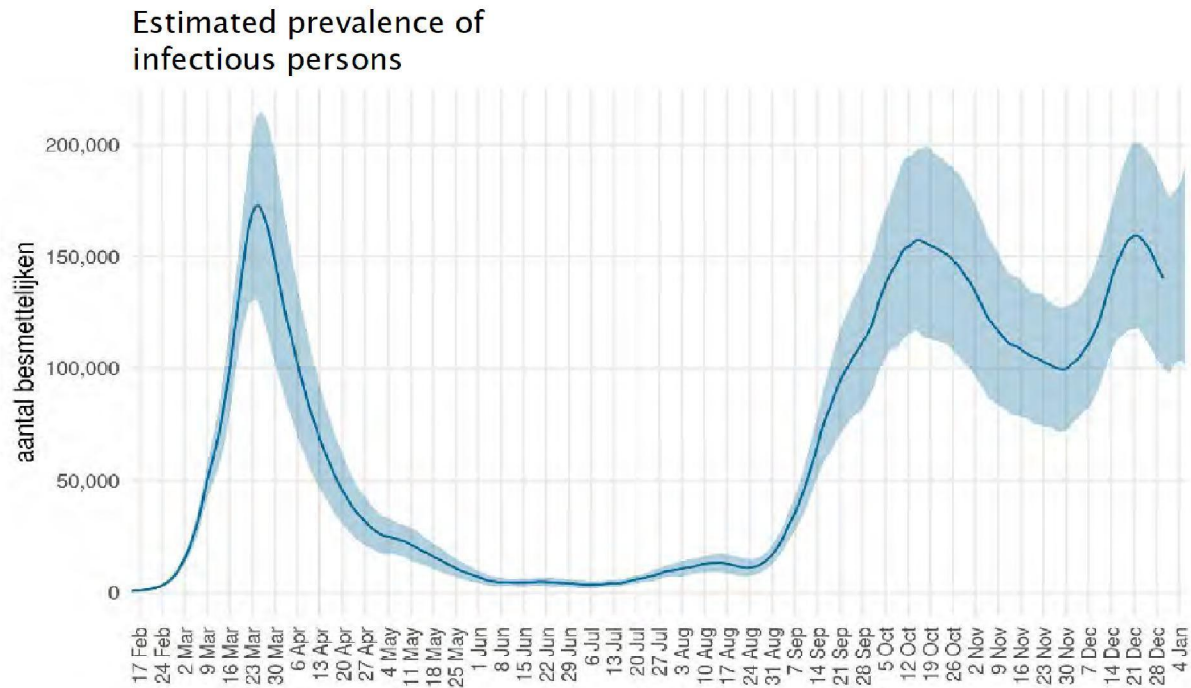
Bron: RIVM

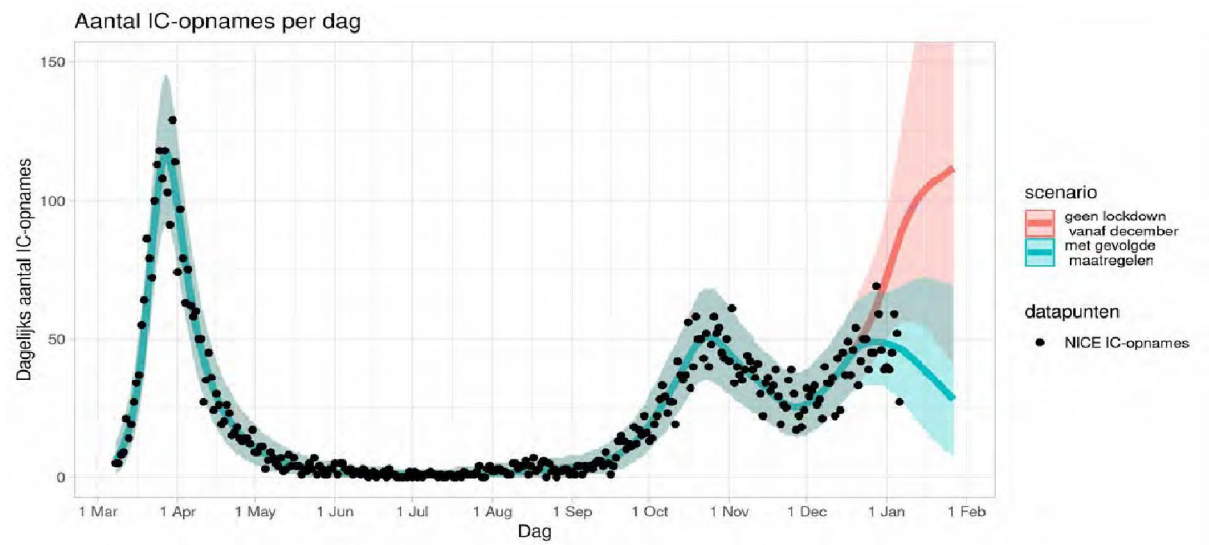


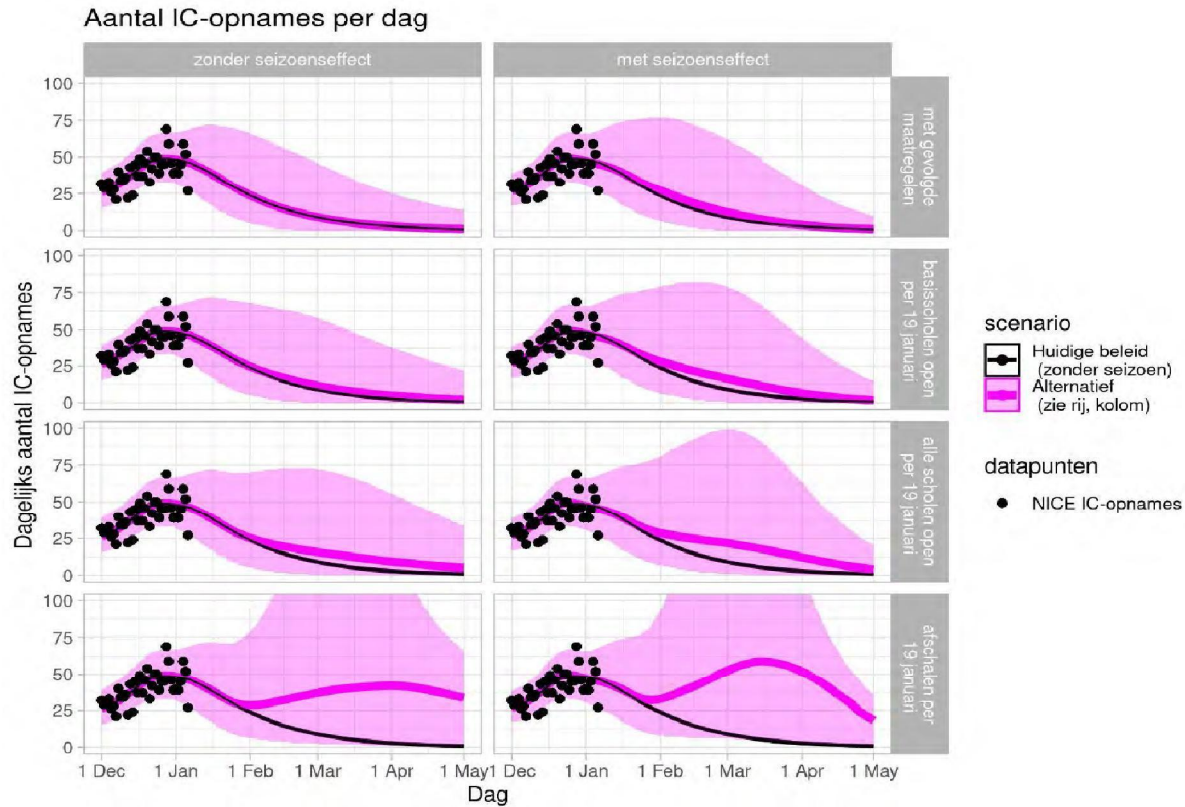
Overledenen per dag vanaf 27 februari 2020

Bron: RIVM









COVID-19 Vaccines

- Many vaccines are in development (> 90)
- 42 candidate vaccines in clinical evaluation
- Clinical trials are ongoing
 - effectiveness against death, severe illness, illness, transmission, infection?
 - rate of vaccine-associated adverse events? by sex, age, background?



Expected effects

Vaccination lowers the rate of severe disease by direct protection

- Highest impact on burden of disease in most vulnerables (main strategy according to Health Council)



Vaccinations lowers (or prevents) transmission indirect protection

benefits both vaccinated and unvaccinated individuals

if the vaccine reduces onward transmission by the vaccinee

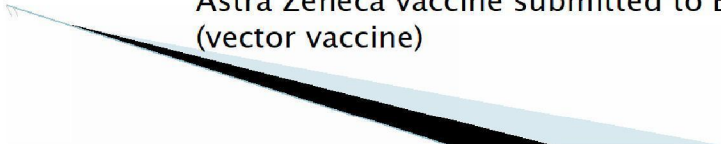


VE against COVID-19 for Pfizer BioNTech
52% after dose 1 (manufacturer)
93% after dose 1 (reanalysis)
95% after dose 2

VE against COVID-19 for Moderna
80% after dose 1 (manufacturer)
94% after dose 2

Both mRNA vaccines

Astra Zeneca vaccine submitted to EMA
(vector vaccine)



Investigation of novel SARS-CoV-2 variant
Variant of Concern 202012/01

Public Health England

Technical briefing 3

This briefing provides an update on the briefing of 28 December 2020

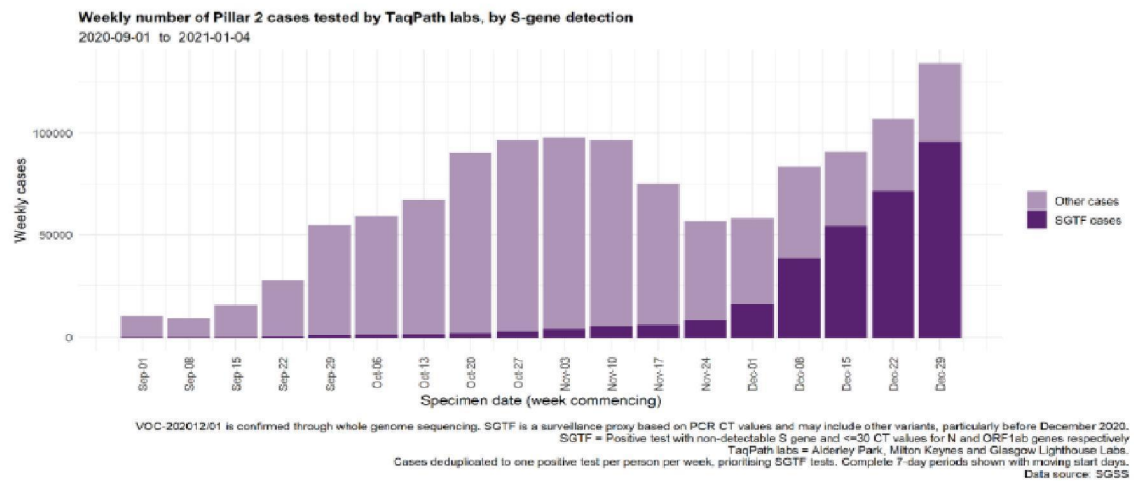


Figure 4. Weekly number of Pillar 2 cases tested by TaqPath labs, by S-gene detection (1 September 2020 to 4 January 2021)

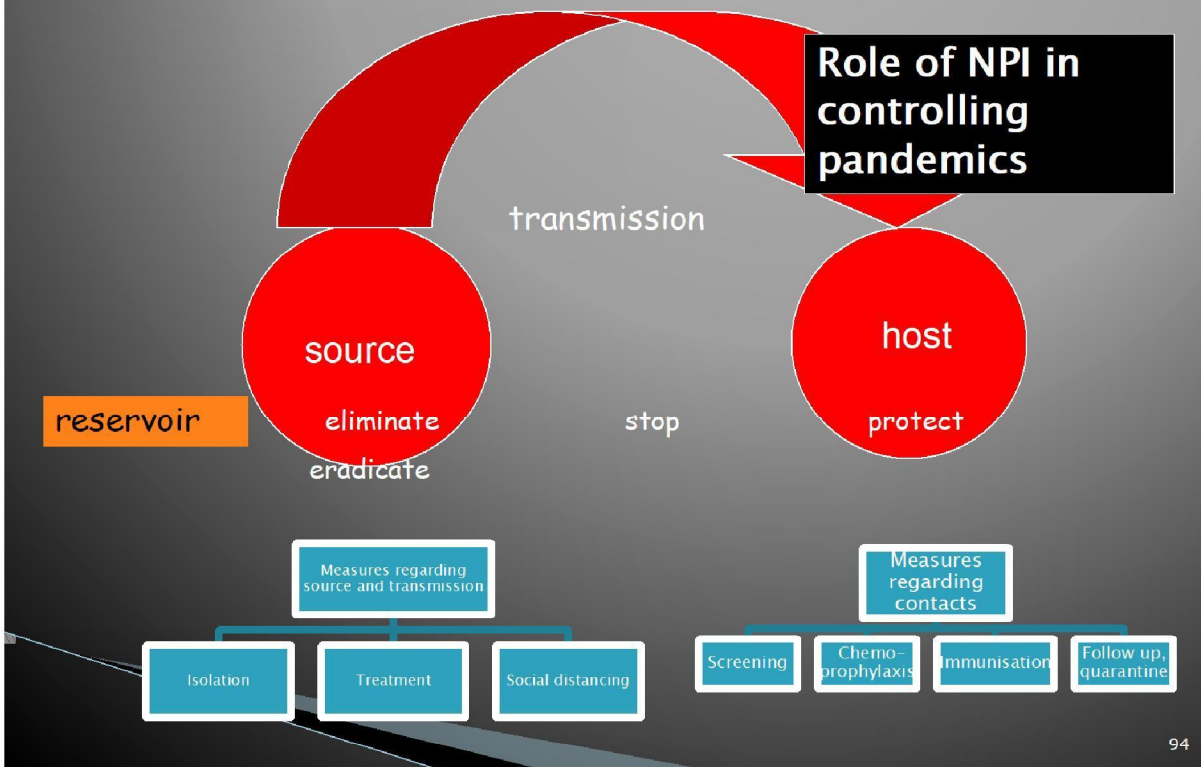
SARS-CoV-2 VOC ex UK

Public Health England

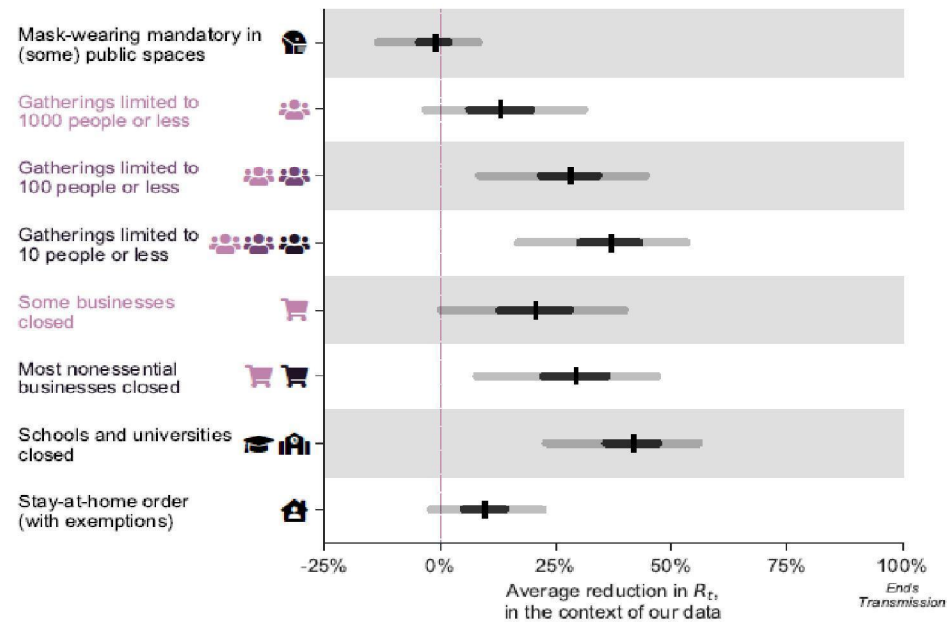
Characteristic of contact	All contacts	Contacts of people with S-gene target failure			Contacts of people with wild type (no S-gene target failure)			Contacts of people without SGTF data	
		All contacts	Contacts that became cases	%	All contacts	Contacts that became cases	%	%	
All	956,519	262,769	39,277	15.0	262,232	28,770	11.0	12.3	
East Midlands	60,153	5,421	782	14.4	26,750	2,899	10.8	11.0	
East of England	154,144	45,396	6,953	15.3	18,791	2,141	11.4	13.0	
London	281,461	101,056	14,638	14.5	41,365	4,392	10.6	12.8	
North East	28,450	5,860	897	15.3	17,454	1,948	11.2	10.0	
North West	71,002	9,575	1,531	16.0	45,852	5,182	11.3	10.3	
South East	186,311	73,133	11,043	15.1	27,849	3,052	11.0	13.0	
South West	41,465	4,692	716	15.3	9,084	1,038	11.4	11.5	
West Midlands	78,112	13,588	2,099	15.5	43,848	4,751	10.8	10.6	
Yorkshire and Humber	53,192	3,448	533	15.5	30,616	3,310	10.8	9.5	
Level of contact*	Direct	875,237	239,922	37,362	15.6	240,491	27,495	11.4	12.8
	Close	79,867	22,710	1,914	8.4	21,038	1,266	6.0	6.5
Age group	0 – 9	135,998	37,512	3,343	8.9	38,537	2,401	6.2	6.8
	10 – 19	172,506	48,748	5,921	12.2	48,368	4,542	9.4	10.0
	20 – 29	111,391	29,896	5,218	17.7	29,817	4,008	13.4	14.6
	30 – 39	111,712	30,693	6,070	19.8	31,873	4,409	14.3	16.2
	40 – 49	126,005	36,238	7,329	20.0	34,353	4,875	14.2	16.3
	50 – 59	101,501	27,749	5,140	20.3	27,609	4,042	14.6	16.7
	60 – 69	44,985	11,261	2,140	20.8	12,223	1,945	15.9	17.1
	70 – 79	17,817	4,116	891	21.7	4,617	748	16.2	17.7
	80+	7,429	1,535	259	19.5	1,941	334	17.2	17.2
	Not known	127,175	35,021	2,256	6.4	33,894	1,466	4.3	5.2

Table 7. Breakdown by contact characteristics by SGTF using TaqPath data

Wrap up!



Brauner et al. medRxiv preprint
The effectiveness of eight nonpharmaceutical interventions
against COVID-19 in 41 countries



For the ones who are very interested in communicable diseases

- * Master's courses (containment, control)



Questions?

