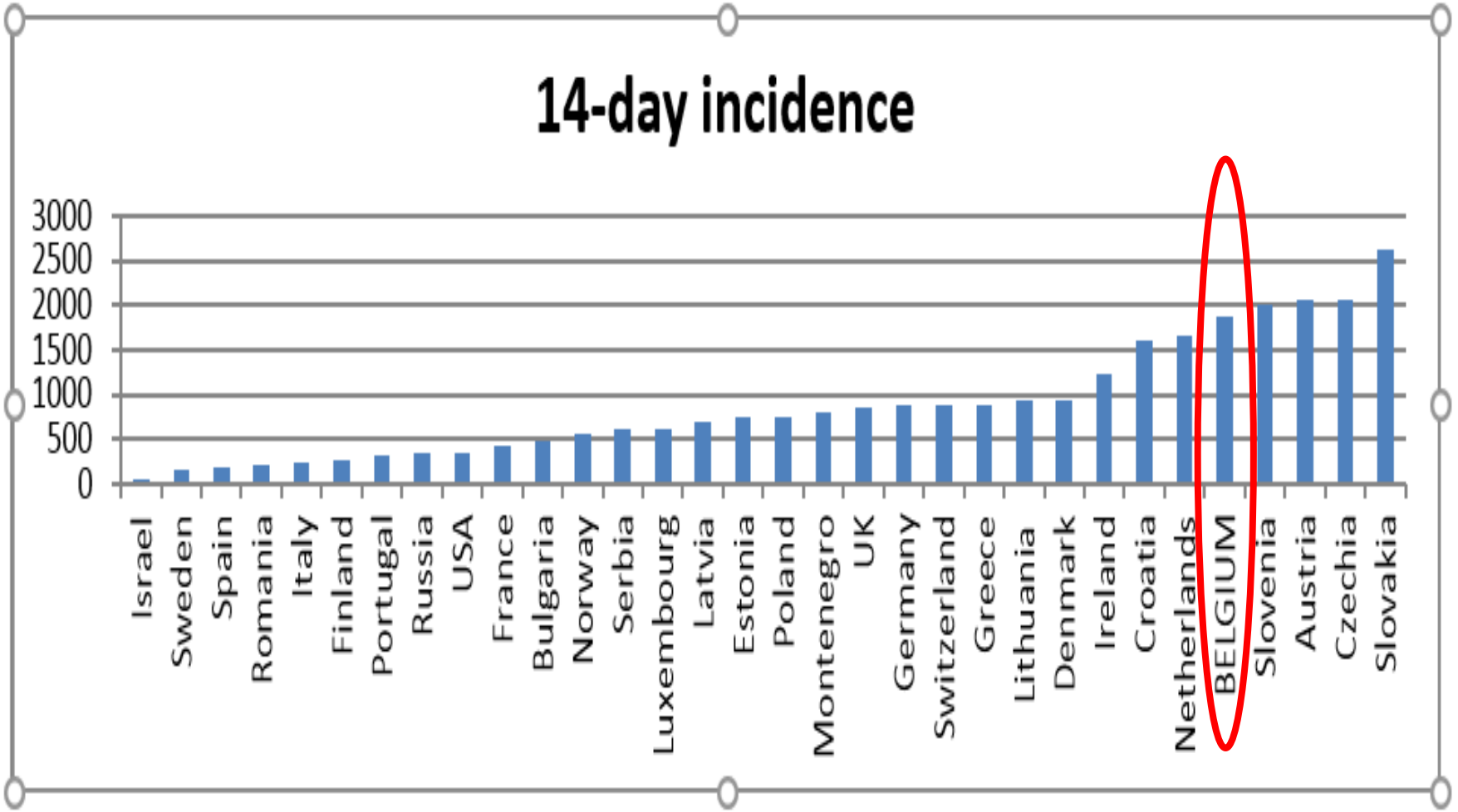
SARS-CoV-2
Omicron

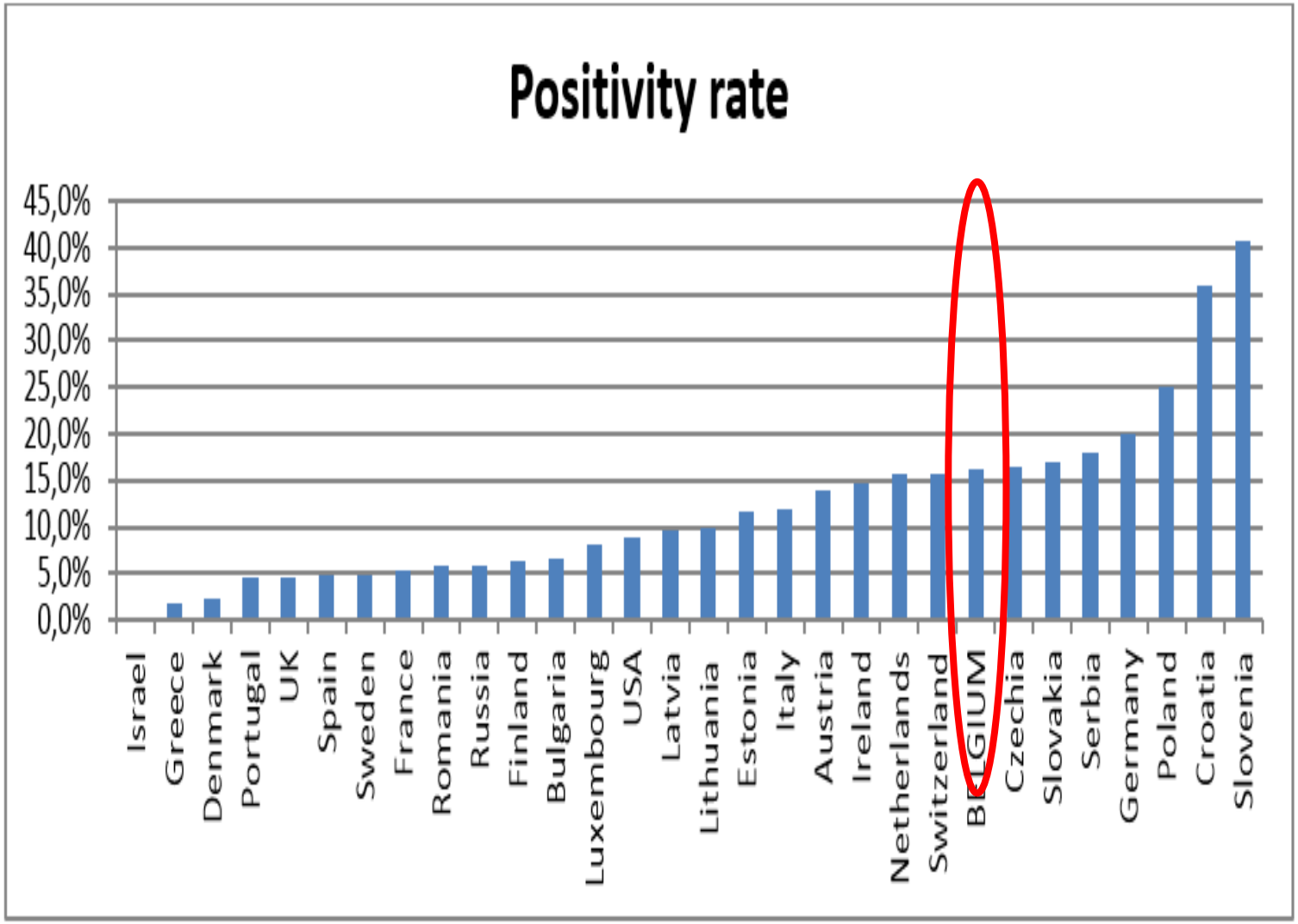
Geert Molenberghs
I-BioStat (UHasselt, KU Leuven)
(lid GEMS, RAG)

Vlaams Parlement, 15/12/21

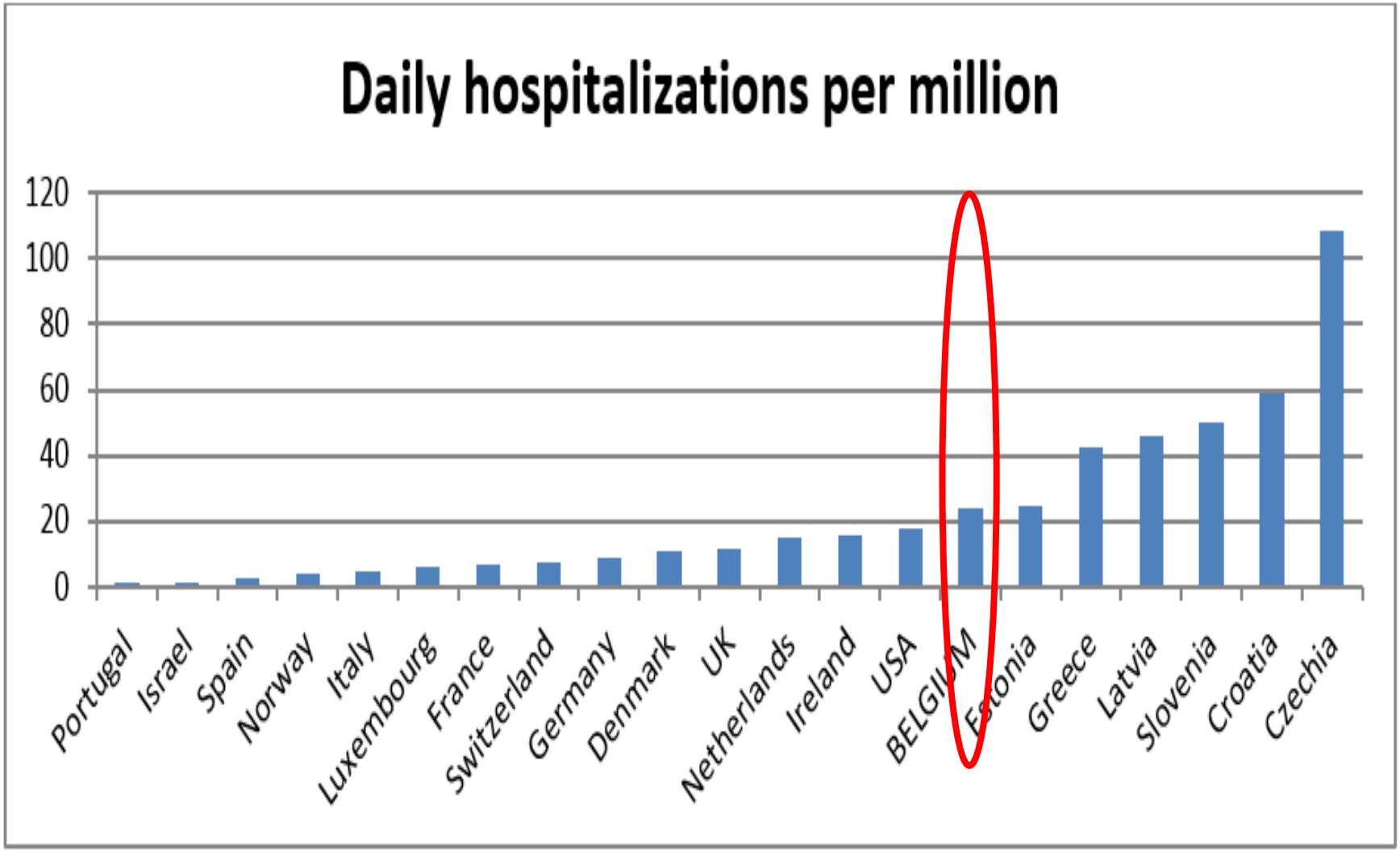
Internationale ijking 27/11/21



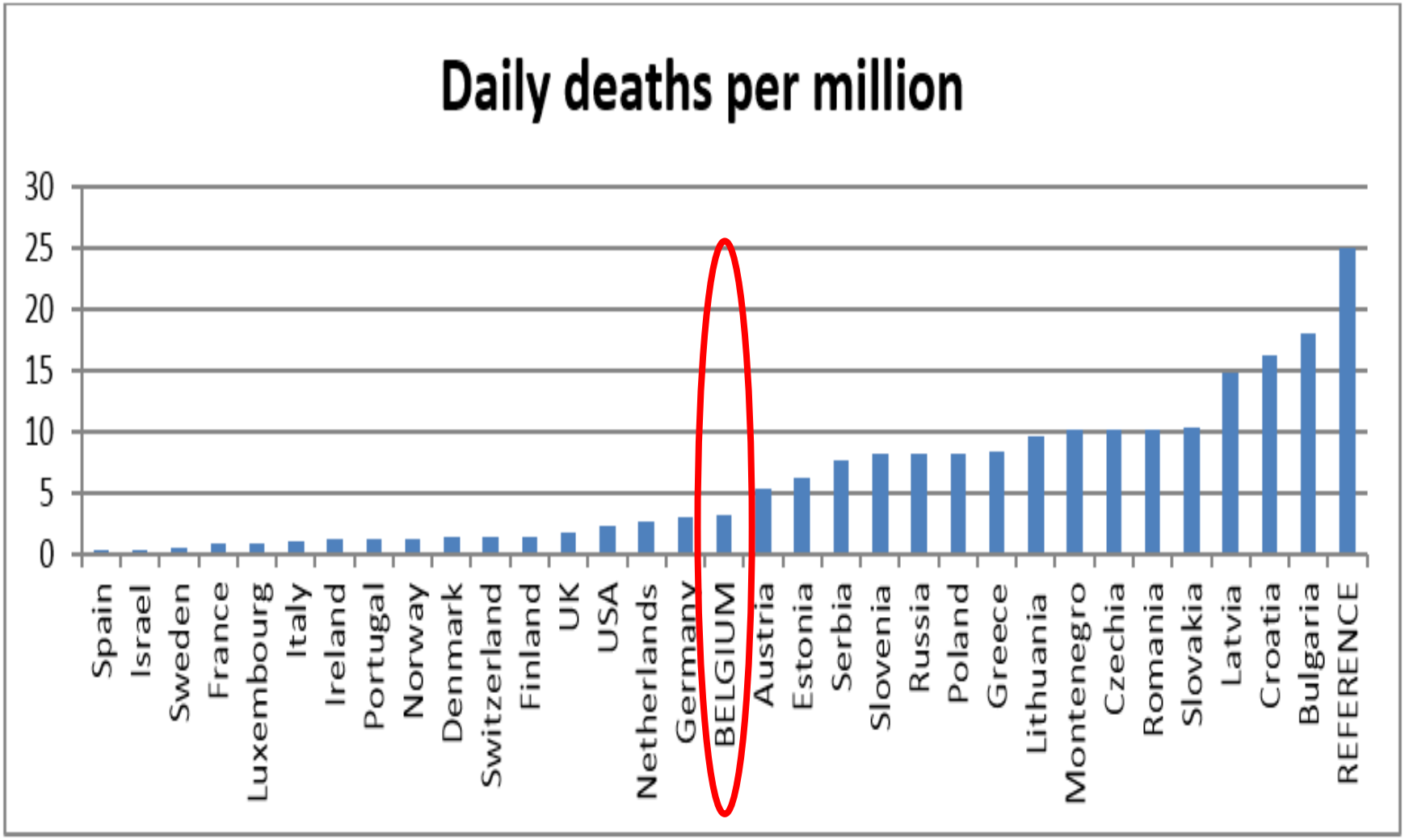
Internationale ijking 27/11/21



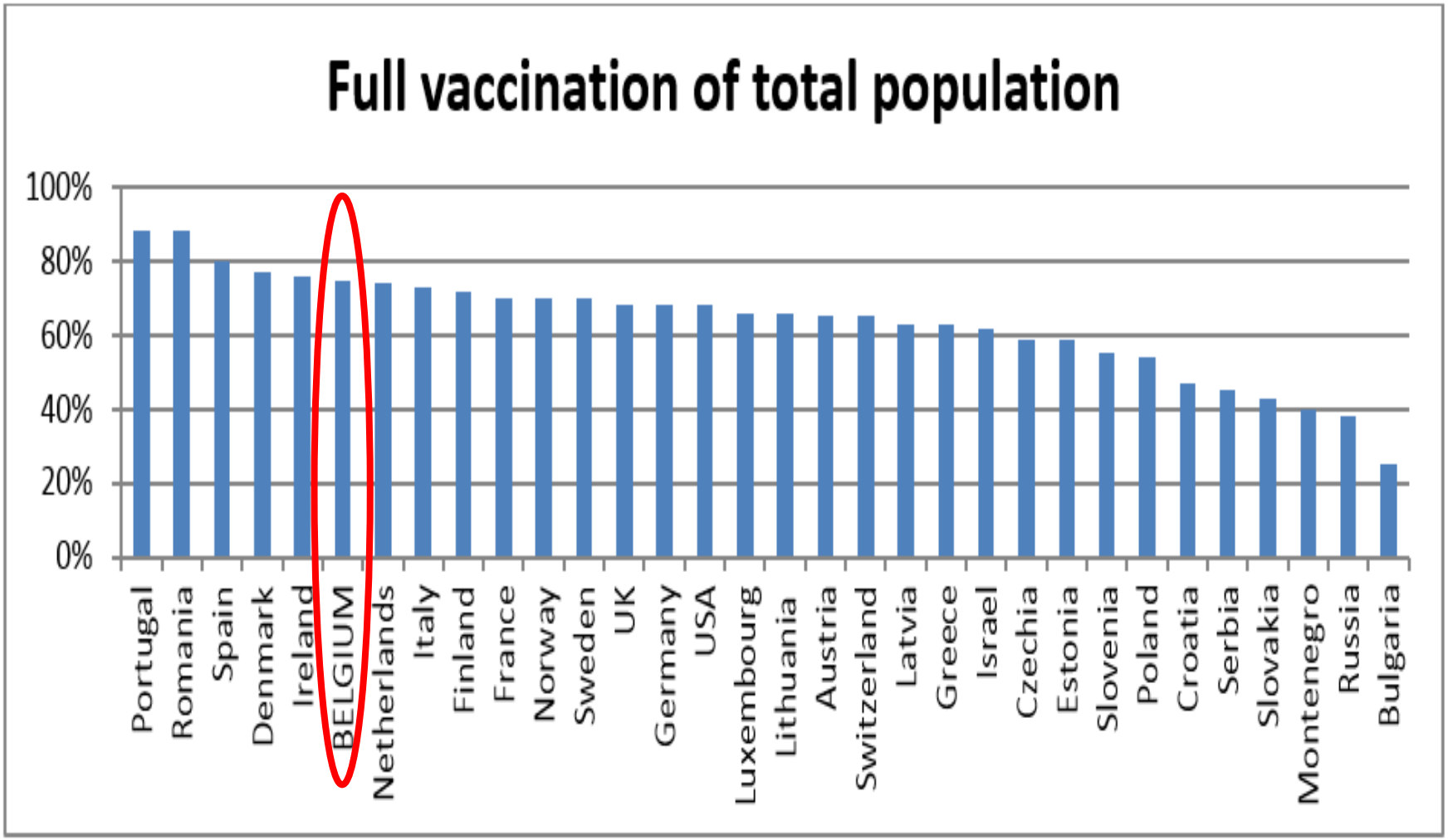
Internationale ijking 27/11/21



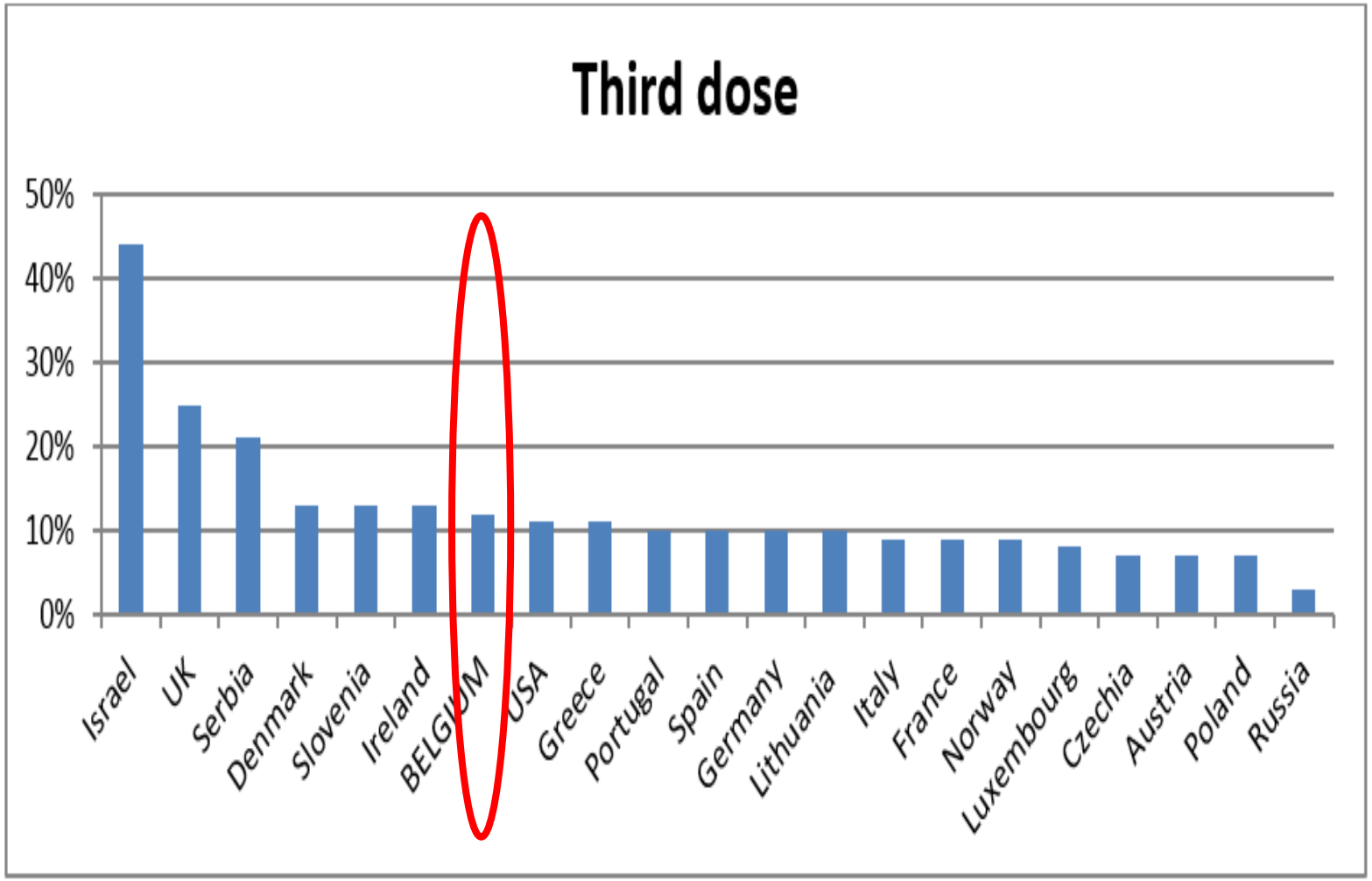
Internationale ijking 27/11/21



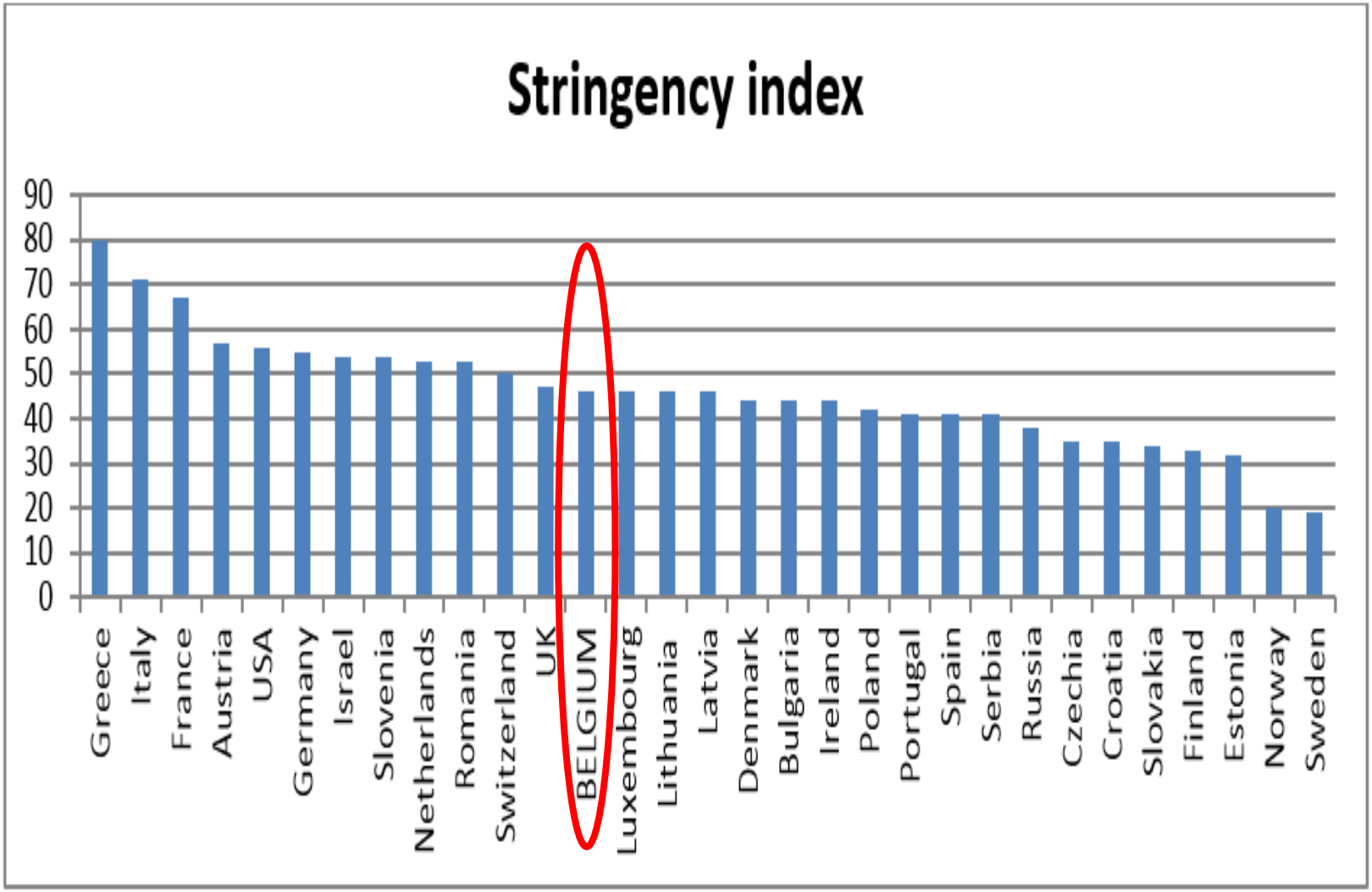
Internationale ijking 27/11/21



Internationale ijking 27/11/21



Internationale ijking 27/11/21



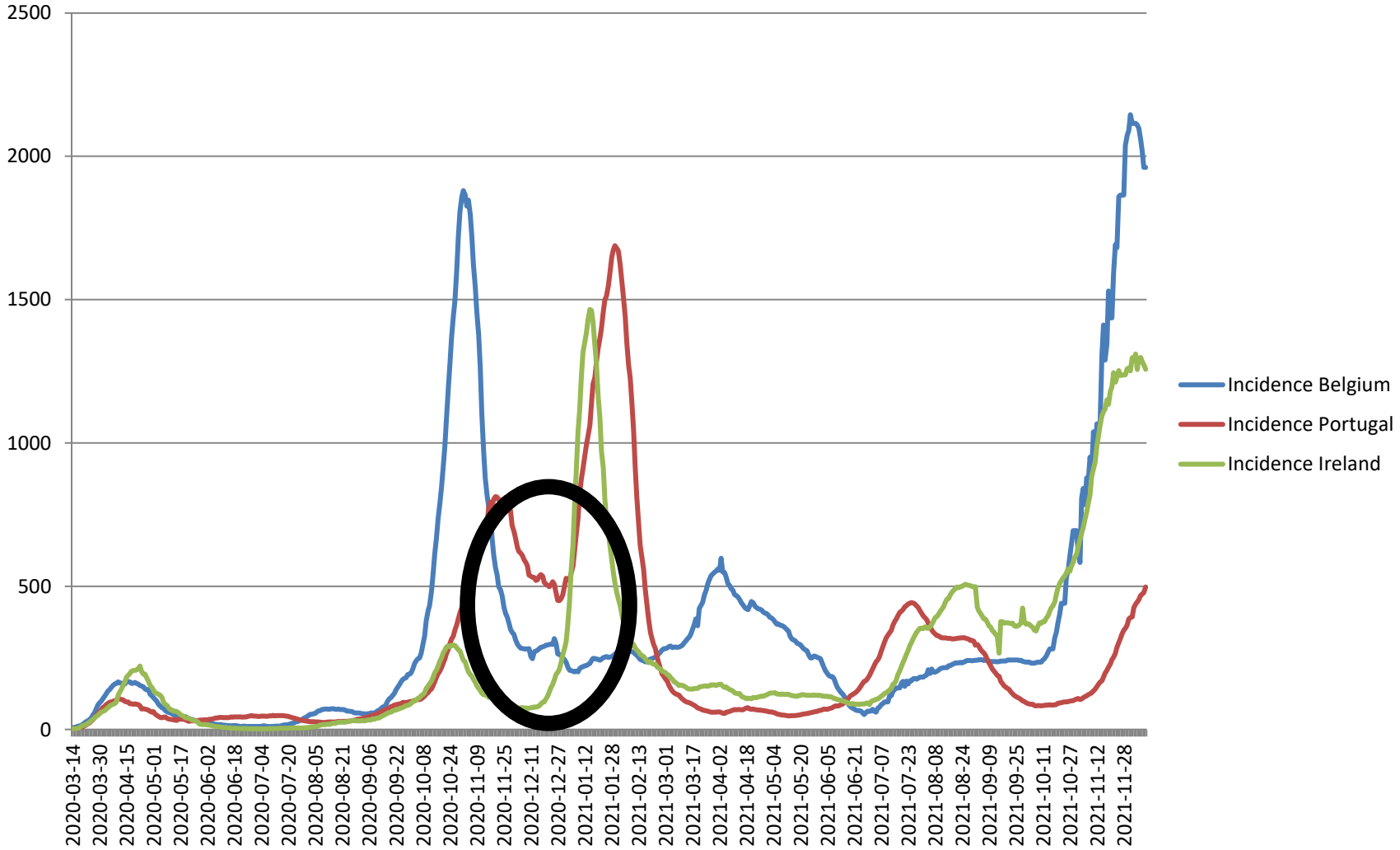
Boosters in enkele landen (12/12/21)

Land	Percentage	Land	Percentage
Israël	44%	Denemarken	20%
Verenigd Koninkrijk	33%	Frankrijk	18%
Servië	23%	Slovenië	17%
Ierland	22%	Verenigde Staten	16%
Duitsland	22%	Luxemburg	15%
België	21%		

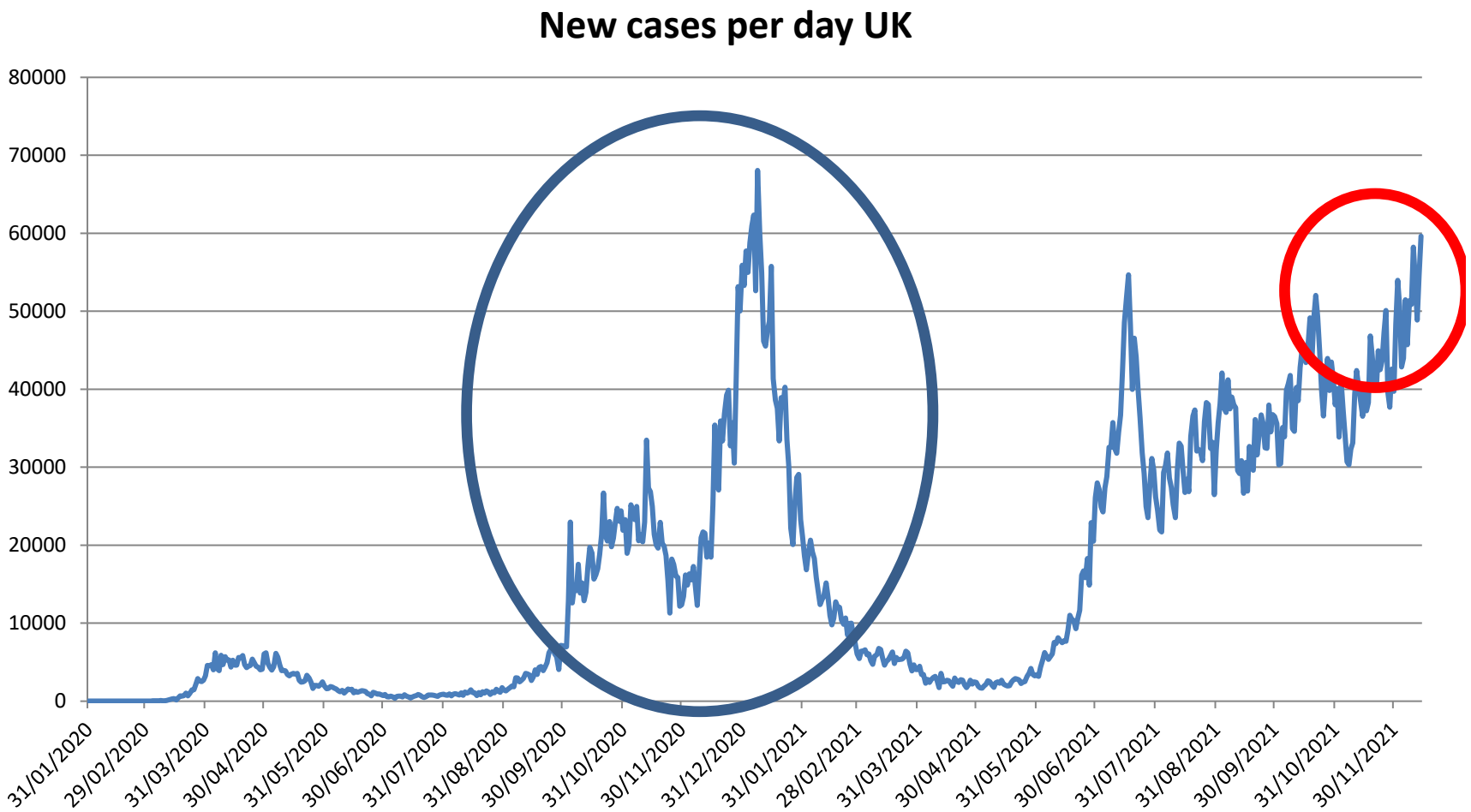
Wat beïnvloedt wat?

Landen-analyse 07/11/21	Besmettingen	ZH opnames	Mortaliteit
			
	Vaccinatie **Stringentie**	***Besmettingen*** **Vaccinatie** **Stringentie**	*Besmettingen* **Vaccinatie** Stringentie
Verklaarde variabiliteit	59%	90%	88%

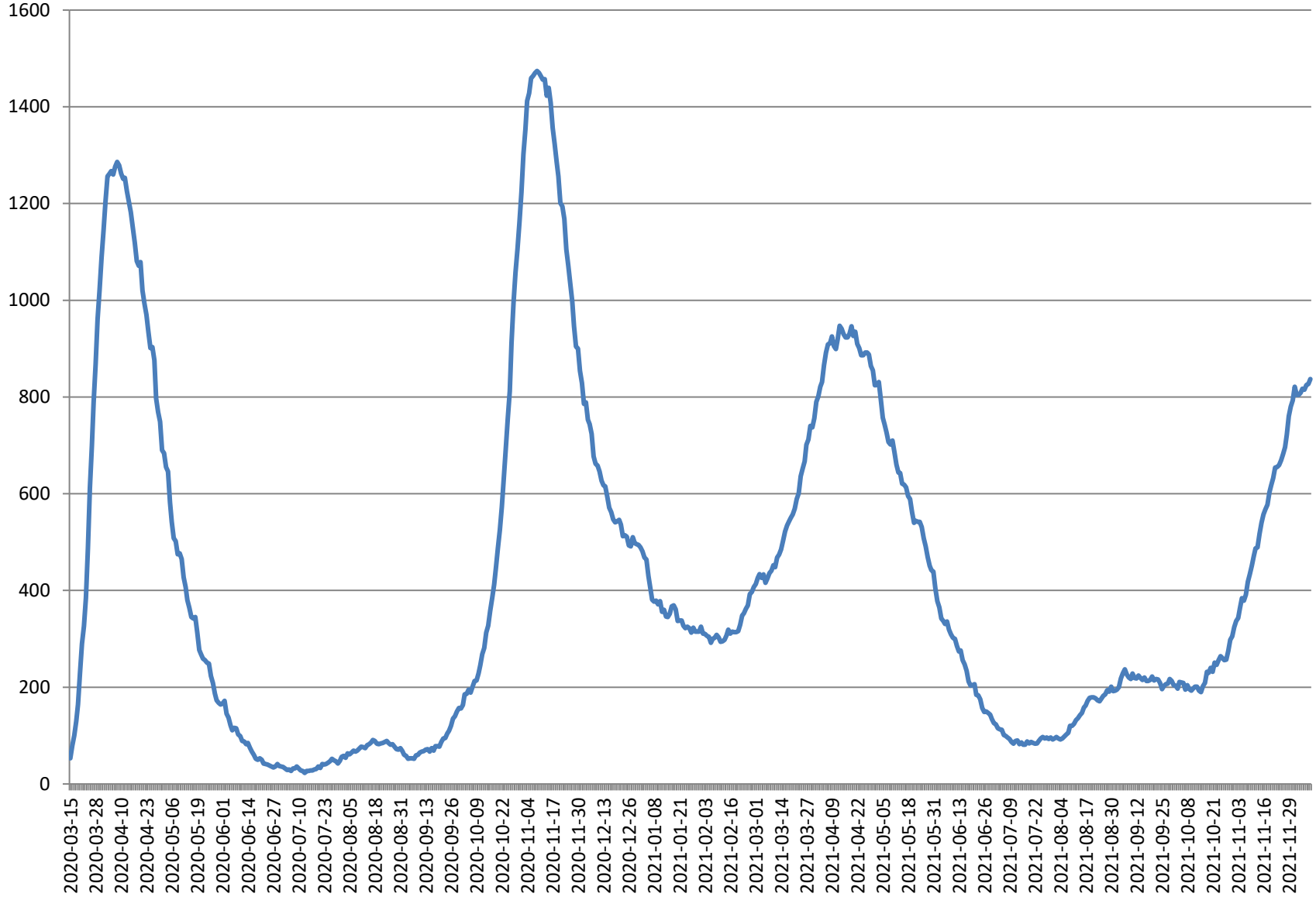
Eindejaar 2020-2021 in drie landen



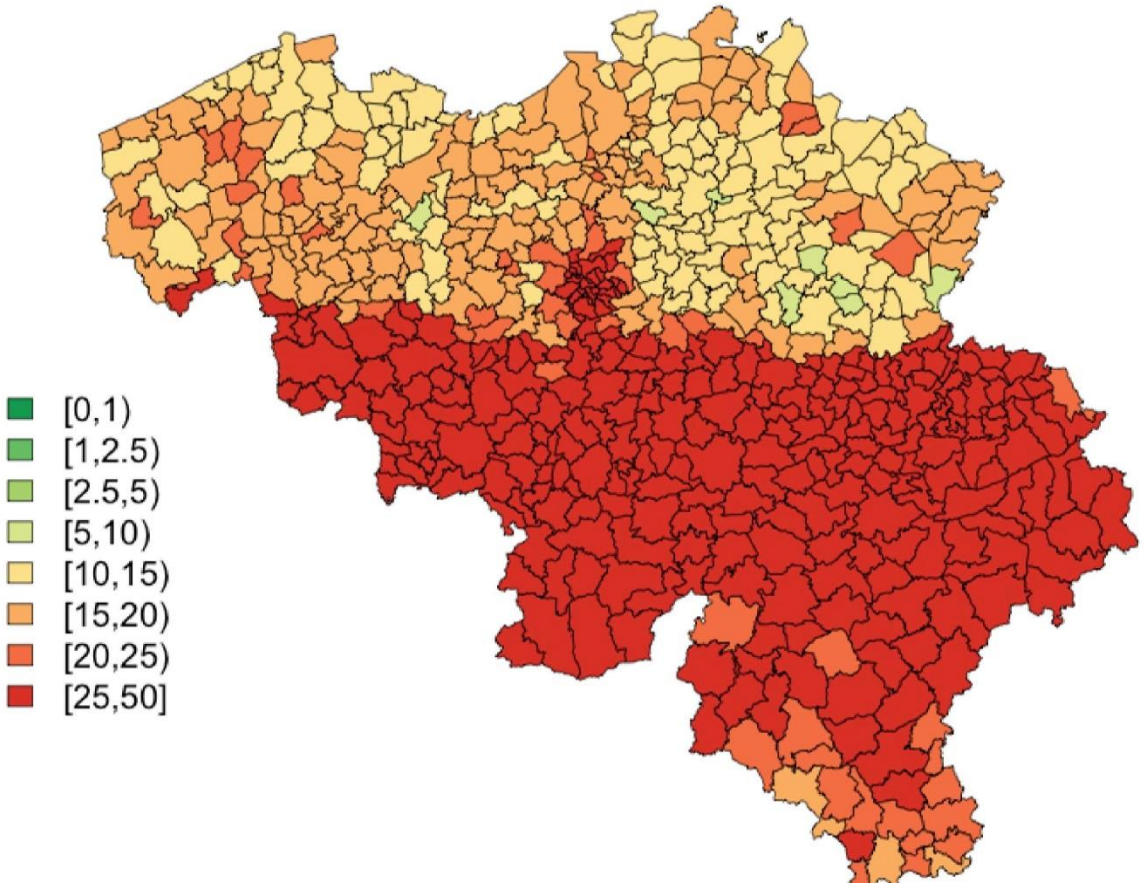
En dan ook het VK



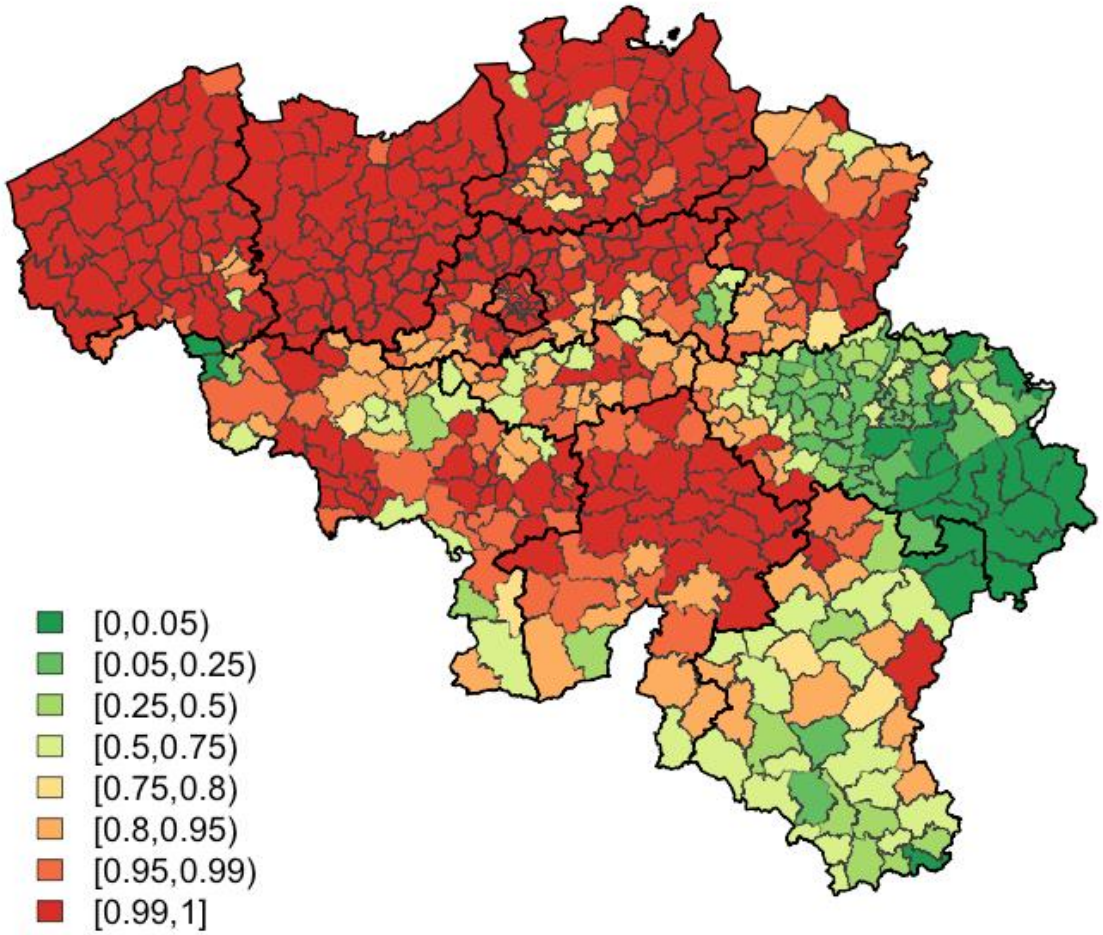
Belgium ICU Occupancy



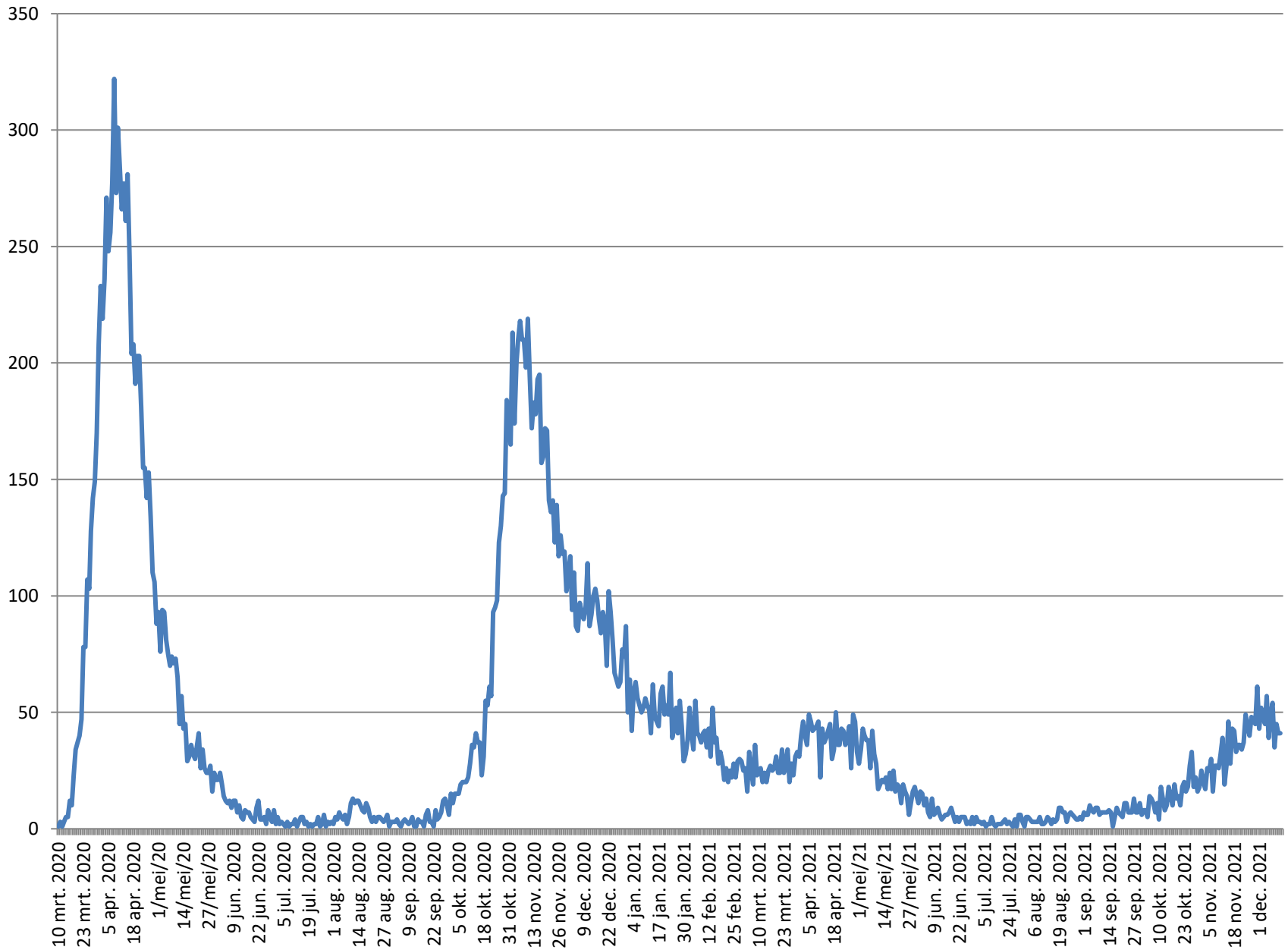
Positivity Map, 11 November 2020



Prob[incidence>500 & growth>1] on 2021-11-14



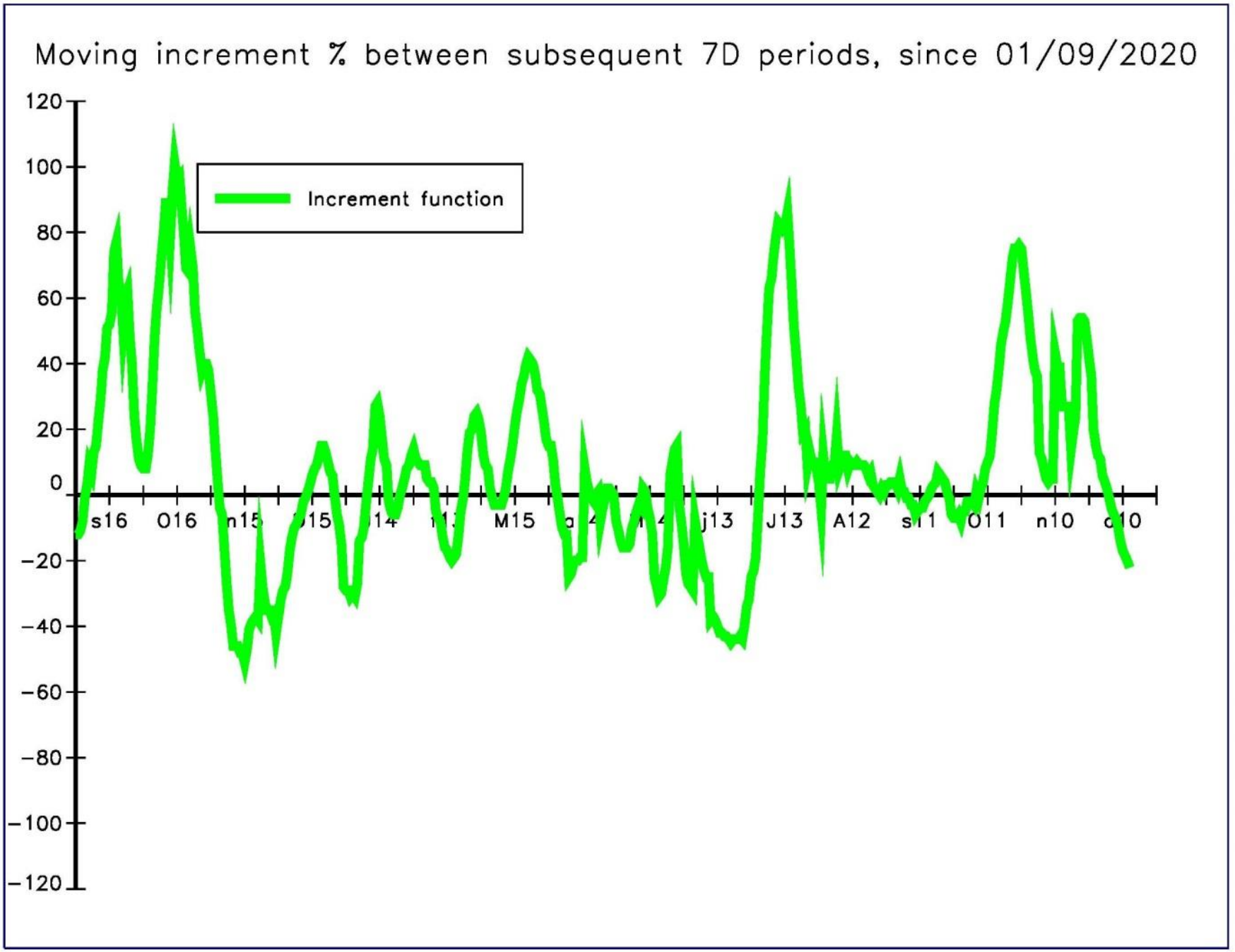
Belgium Daily Deaths



De ECDC regio's (Week 48)

- 211 regio's:
  - 132 donkerrood
  - 62 rood
  - 17 oranje
  - 0 groen

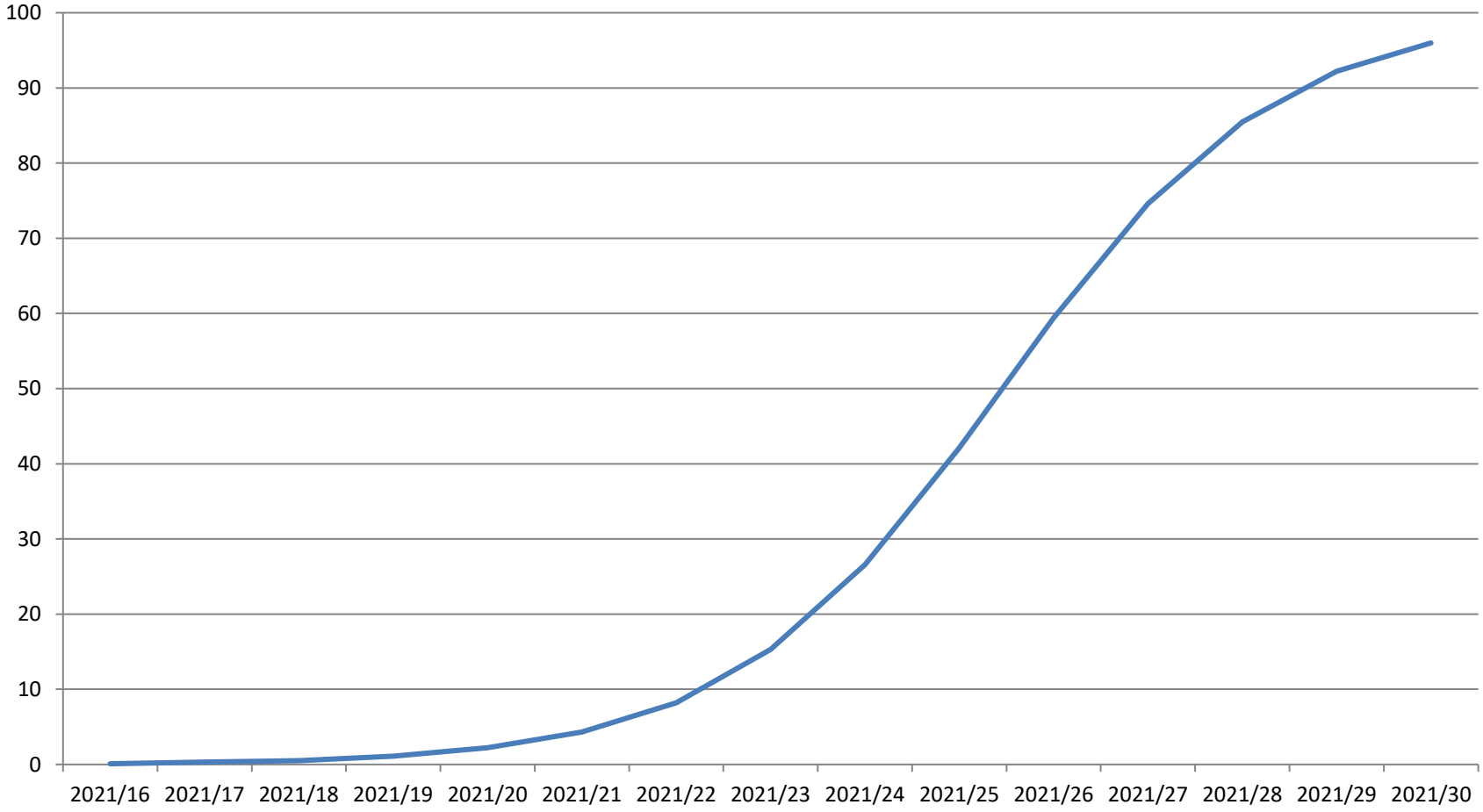
Land	Regio	Plaats	Incidentie
Slovakije	Bratislava	#1	3301
België	Vlaanderen	#9	2465
België	Wallonië	#32	1680
België	Brussel	#44	1435
Frankrijk	Mayotte	#211	53


Moving increment % between subsequent 7D periods, since 01/09/2020
Increment function
120
100
80
60
40
20
0
−20
−40
−60
−80
−100
−120
s16
O16
n15
M15
j13
J13
A12
O11
n10

De kracht van delta (& omicron)

Infectie (start met 4 besmette mensen)	R0	Na 10 generaties	H.I.T. (perfect vaccin)
Seizoensgriep	1.5	684	33.3%
SARS-CoV-2 (Wuhan)	3.0	354.292	66.7%
SARS-CoV-2 (Alfa)	5.0	48,828,124 (~50 miljard)	80.0%
SARS-CoV-2 (Delta)	8.0	4,908,534,052 (~5 miljard)	87.5%
SARS-C0V-2 (Omicron)	?	?	?

De verspreiding van delta



Delta versus Omicron

- UK, DK, SA:
  - Verdubbelingstijd ongeveer 2,5 dagen
- BE:
  - Delta van 0.3% naar 3.0% in 3 weken
  - Omicron van 0.3% naar 3.0% in 1 week
  - Verdubbelingstijd omicron ongeveer 2,5 dagen…
  - Indien deze snelheid aanhoudt:
    - **50% met Kerstmis**
    - **90% met Nieuwjaar**

Relatie Besmettingen – ZH opnames voor Engeland, VK

Engeland		
Golf	**Wanneer**	**Effect op ZH opnames**
Golf 2 (Wuhan / Spaans)	Najaar 2020	64%
Golf 3 (Alfa)	Winter – lente 2021	71%
Golf 4 (Delta)	Vanaf mei 2021	52%

Relatie Besmettingen – ZH opnames voor Catalonië, Spanje

Catalonië		
Golf	**Wanneer**	**Effect op ZH opnames**
Golf 2 (Wuhan / Spaans)	Najaar 2020	61%
Golf 3 (vroeg-alfa)	Winter 2021	65%
Golf 3 (Alfa)	Lente 2021	65%
Golf 4 (Delta)	Laat-juni - juli 2021	55%

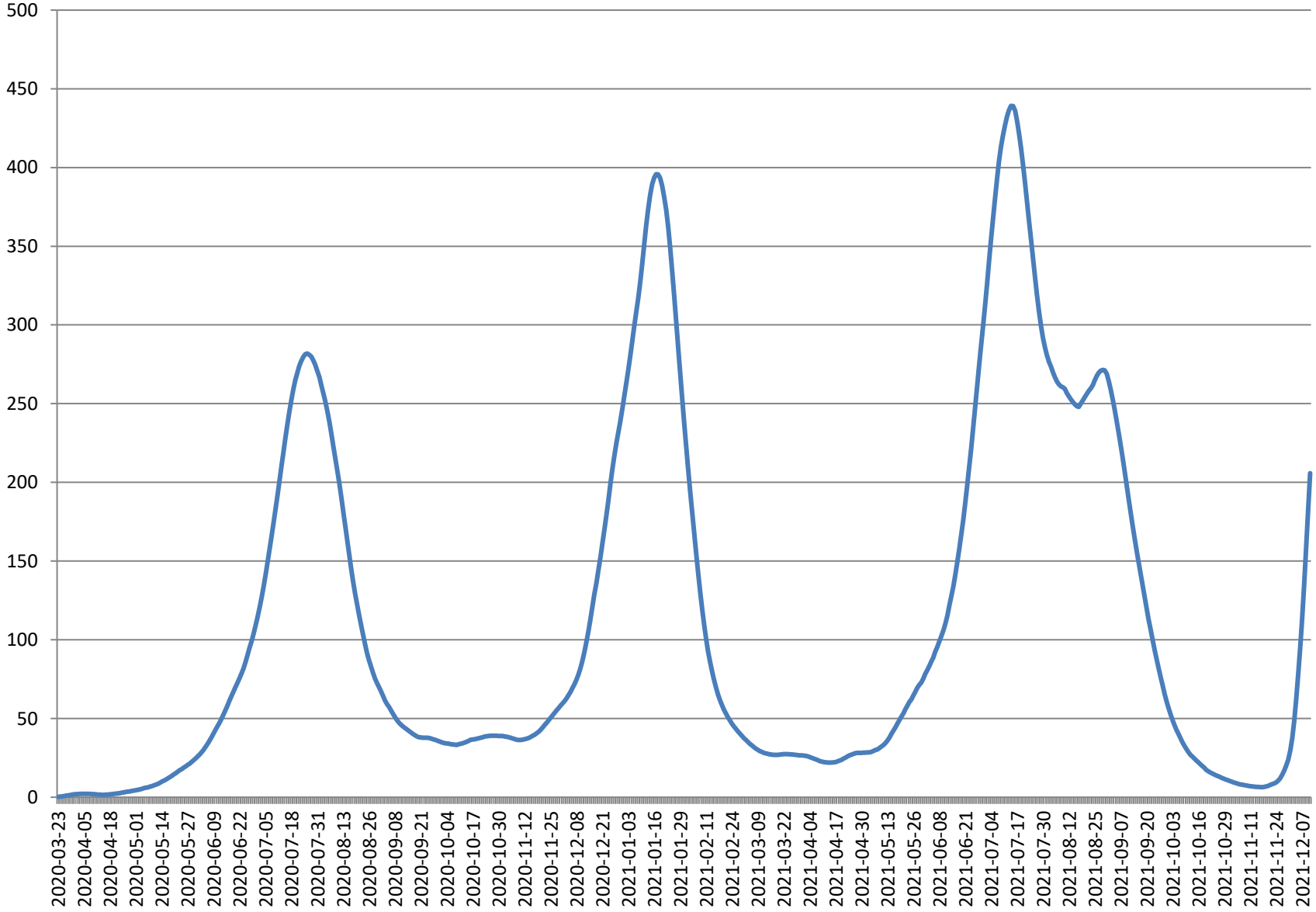
Relatie Besmettingen – ZH opnames voor België

België		
Golf	**Wanneer**	**Effect op ZH opnames**
Golf 2 (Wuhan / Spaans)	Najaar 2020	58%
Golf 3 (Alfa)	Winter – Lente 2021	58%
Golf 4 (Delta)	Vanaf eind juni 2021	35%

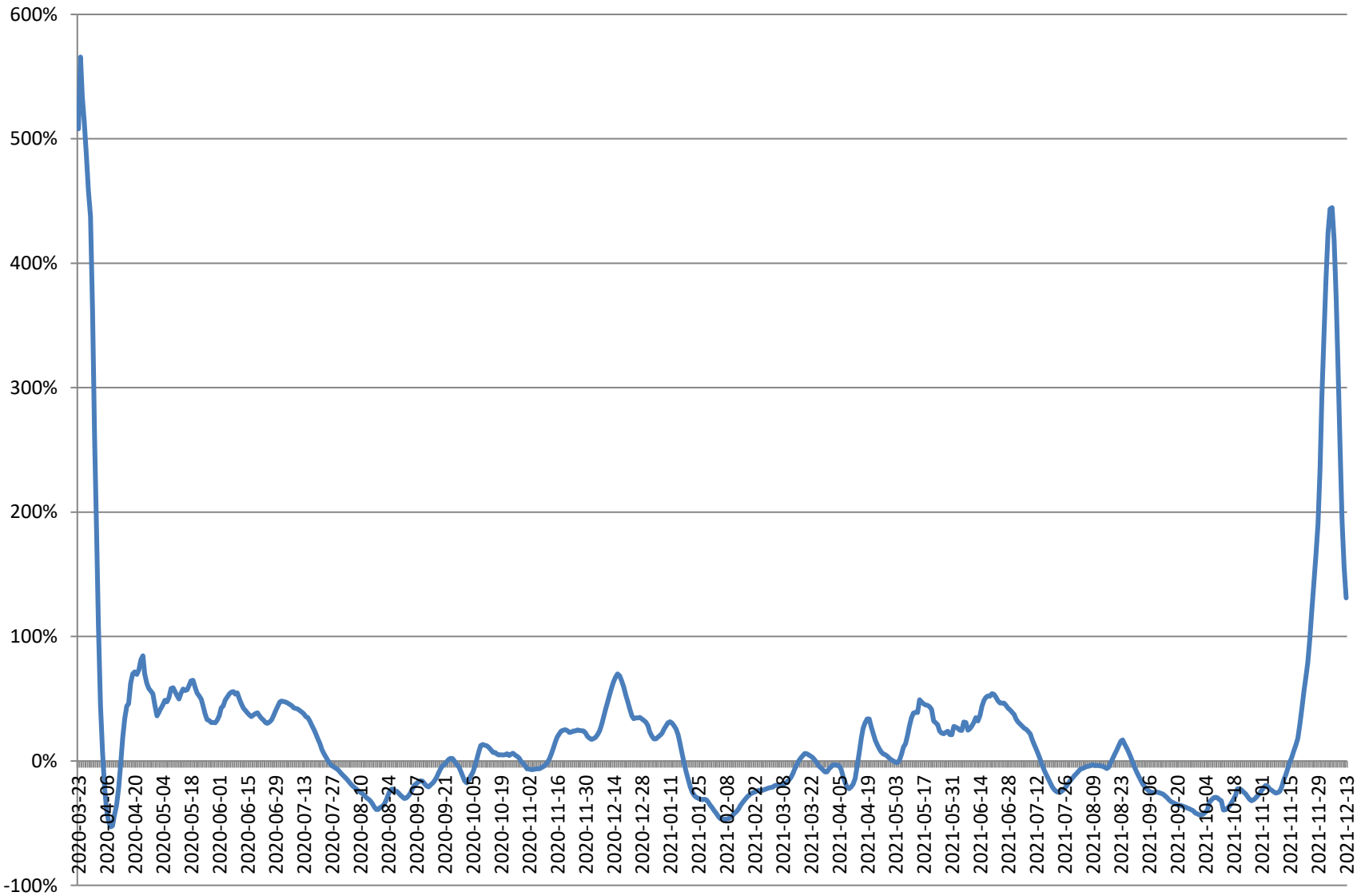
Relatie Besmettingen – ZH opnames voor Zuid-Afrika

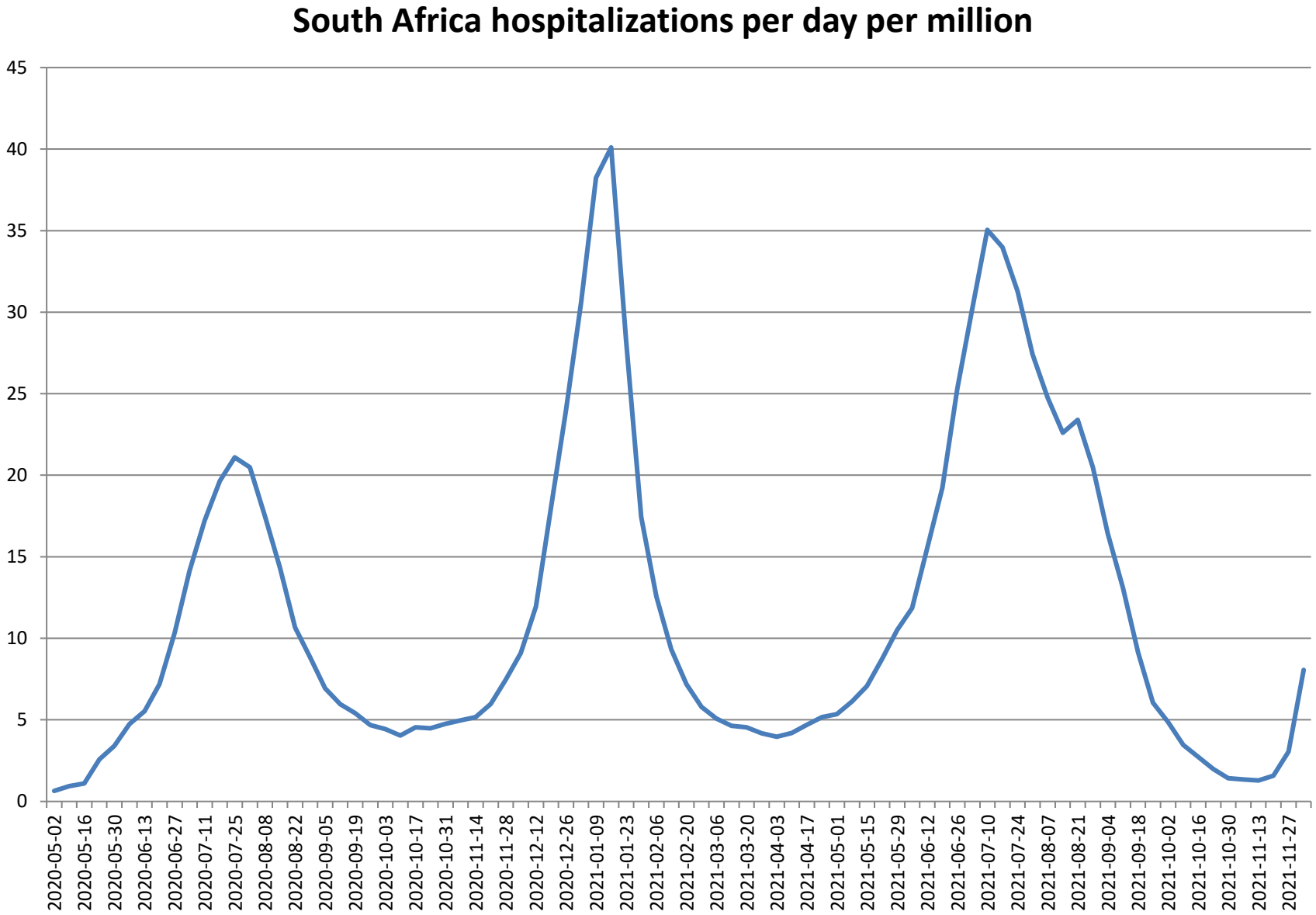
Zuid-Afrika		
Periode	**Metriek**	**Effect**
23/10/21 – 27/11/21	Gevallen	* 3.5
30/10/21 – 04/12/21	ZH opnames	* 5.7
27/11/21 – 11/12/21	Gevallen	Nogmaals vermenigvuldigd met 10.1 …

Incidence South Africa



Growth South Africa




South Africa hospitalizations per day per million
45
40
35
30
25
20
15
10
5
0
2020-05-02
2020-05-16
2020-05-30
2020-06-13
2020-06-27
2020-07-11
2020-07-25
2020-08-08
2020-08-22
2020-09-05
2020-09-19
2020-10-03
2020-10-17
2020-10-31
2020-11-14
2020-11-28
2020-12-12
2020-12-26
2021-01-09
2021-01-23
2021-02-06
2021-02-20
2021-03-06
2021-03-20
2021-04-03
2021-04-17
2021-05-01
2021-05-15
2021-05-29
2021-06-12
2021-06-26
2021-07-10
2021-07-24
2021-08-07
2021-08-21
2021-09-04
2021-09-18
2021-10-02
2021-10-16
2021-10-30
2021-11-13
2021-11-27

Werkzaamheid vaccins?

- We kijken naar een reeks eindpunten:
  - Transmissie
  - Infectie (inclusief asymptomatisch)
  - Symptomatische COVID
  - Ernstige COVID
  - Hospitalisatie
  - ICU / mechanische ventilatie
  - Dood

Vaccins

- *Efficacy – effectiveness*
  - Surrogaat / *Correlates-of-Protection*:
  - Humorale immuniteit
  - Cellulaire immuniteit
  - …
- Een bewegend doel …

W.T. → **α** → β → γ → **δ** → **ο** → …

Gardner and Kilpatrick medRxiv 13 Dec estimate vaccine effectiveness (VE) against omicron, extrapolated from neutralizing antibodies.

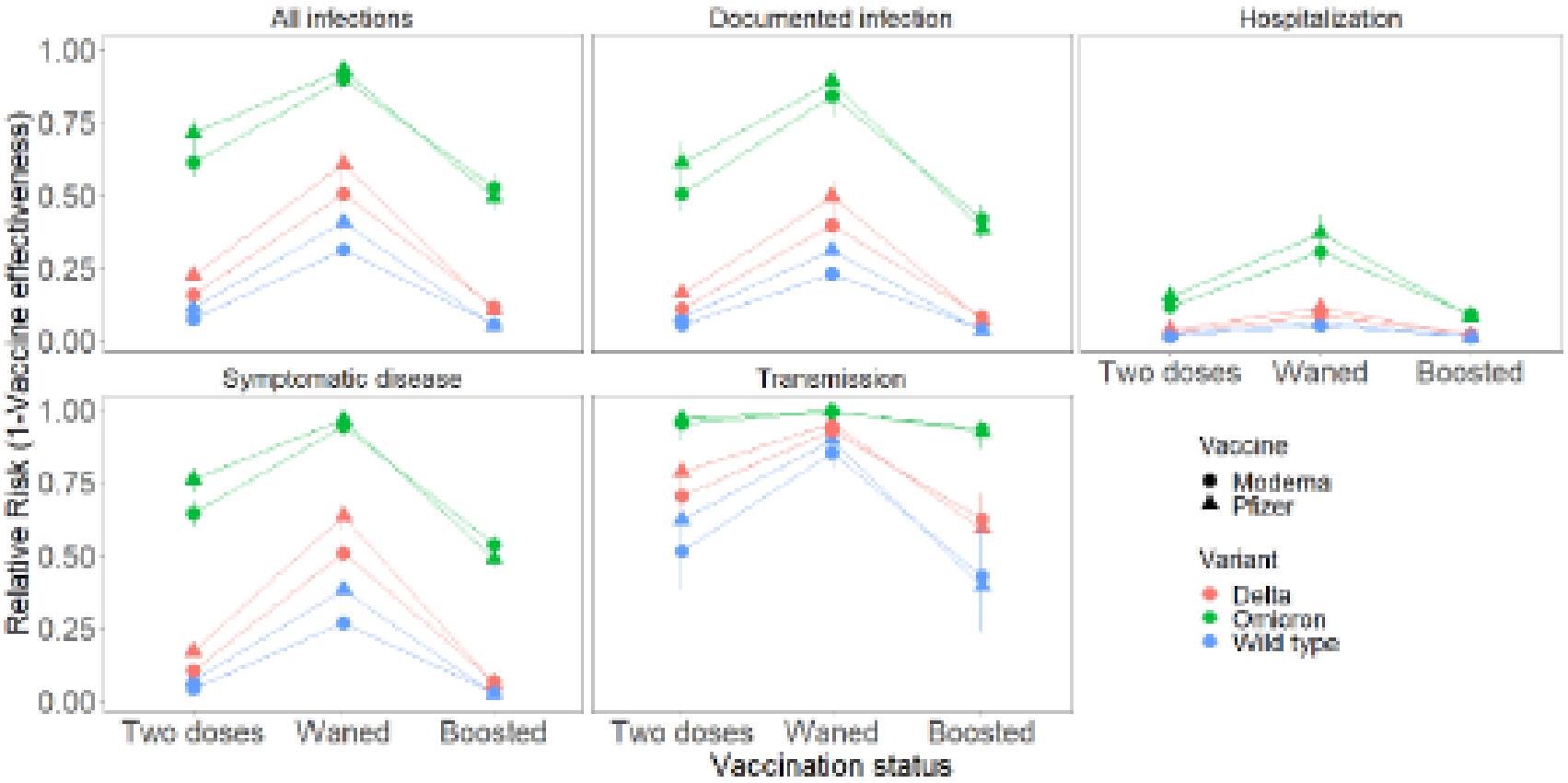


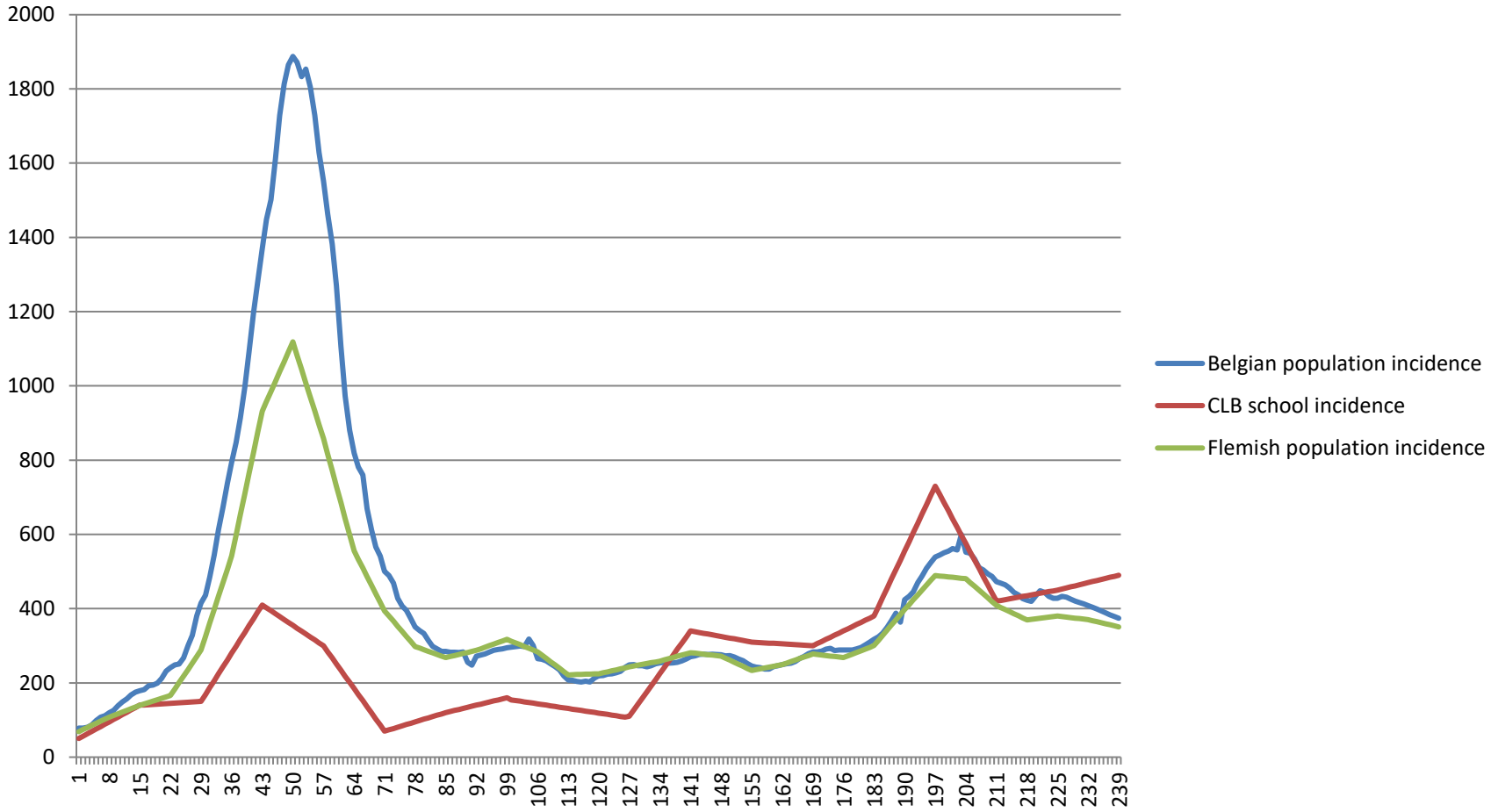
Fig 6. Estimated relative risk (1-VE) for five endpoints, two vaccines, and three variants for three vaccine statuses (shortly after vaccination(two doses), 6 months (Waned), and shorty after a 3rd dose (Boosted).

Vaccineren – Vaccineren – Vaccineren & Maatregelen

- Vaccinatie:
  - Boost de boostercampagne!
  - Vaccineer wie het nu nog niet is
  - 5 – 11 jarigen
- Een aangepast pakket aan maatregelen zal nodig blijven in de omikron-periode

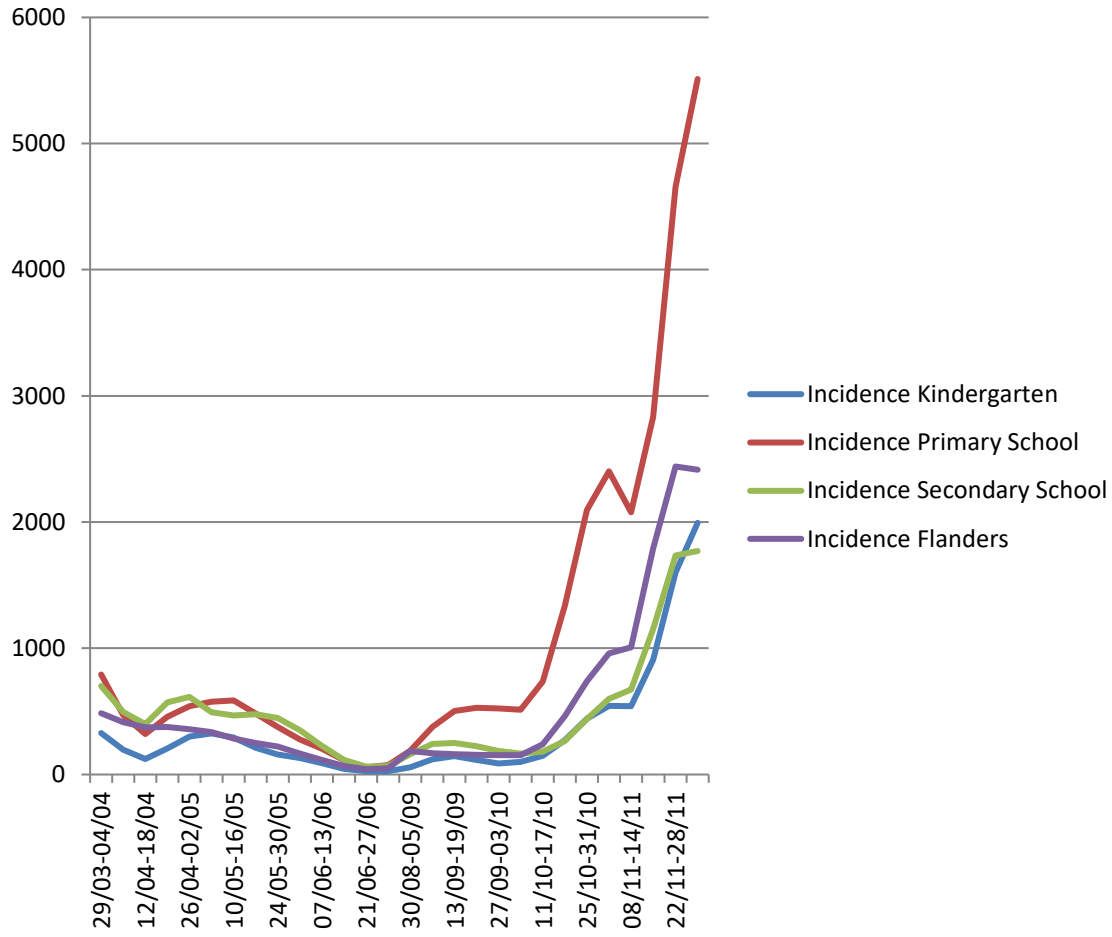
BACKUP

Incidentie Vlaams schoolssysteem (2020-2021)

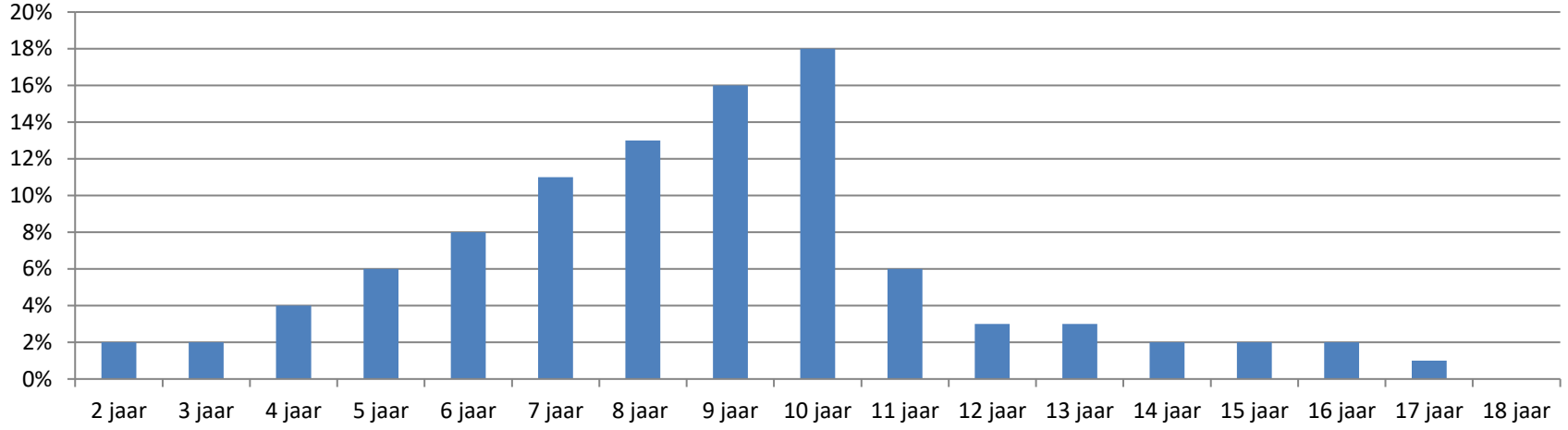


14-d incidentie week 2021/48:

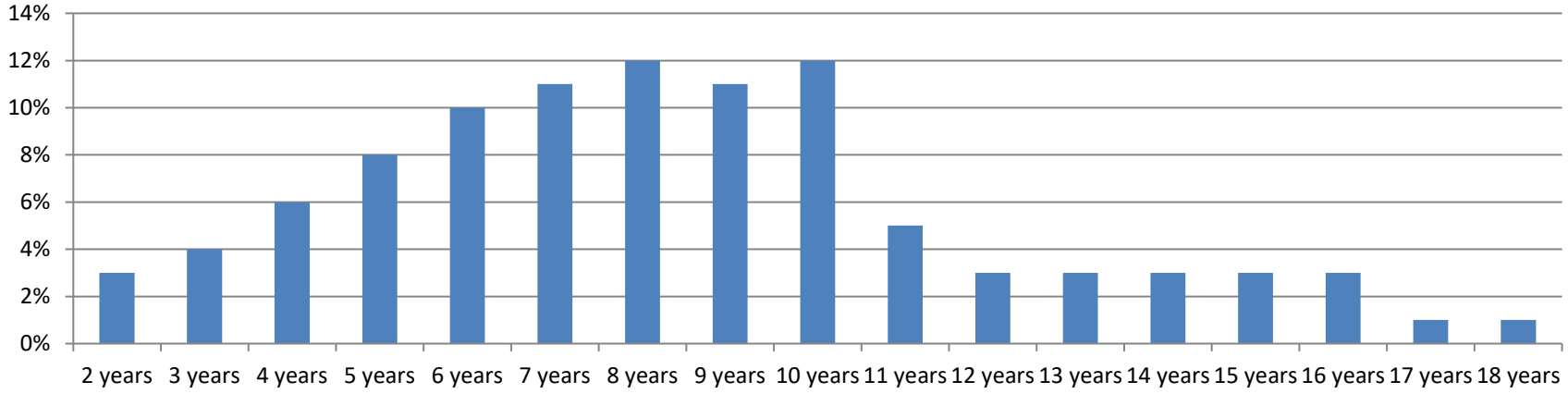
- Kleuterschool: 1994
- Lagere school: 5511
- Middelbare school: 1771
- Vlaanderen: 2415



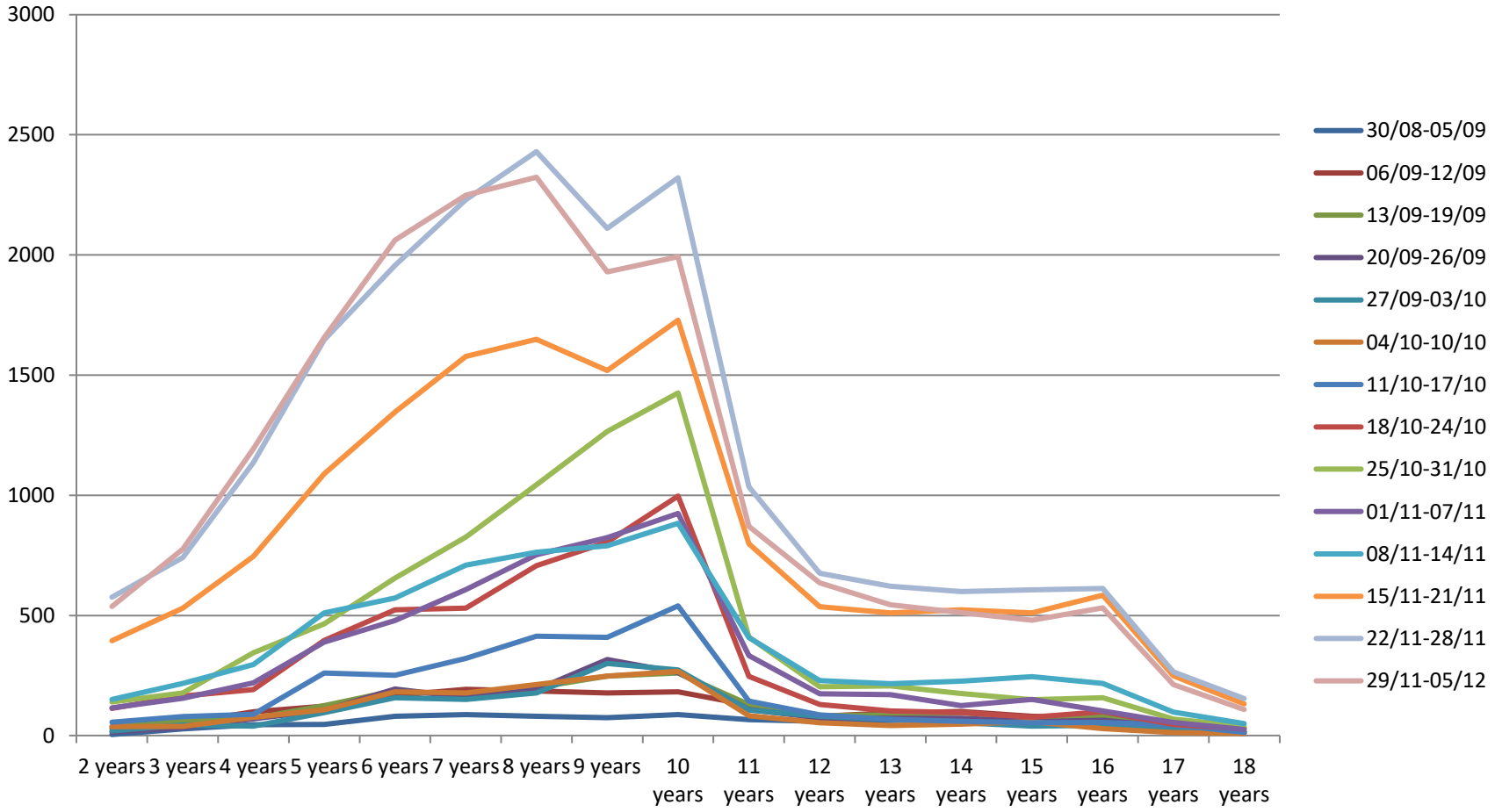
Fraction infections 25/10 - 07/11 in Flemish schools



Fraction infections 22/11 - 28/11 in Flemish schools



Infecties in Vlaamse scholen
Week voor week



Invloed op incidentie

Model for log(incidence)	
Effect	Estimates (standard errors)
Intercept	-365.93 (123.64)
Logit(full vaccination)	8.07 (4.74)
Logit(full vaccination)^2	-0.80 (0.39)
Log(stringency)	300.35 (102.34)
Log(stringency)^2	-80.26 (28.08)
Log(stringency)^3	7.11 (2.55)
Logit(full vaccination * Log(stringency)	-2.26 (1.21)
R2	0.59

Invloed op ZH opname en mortaliteit

Effect	Estimates (standard errors)	
	Model for hospitalization	Model for death
Intercept	78.8120 (37.7227)	15.8969 (8.3891)
Incidence	0.0334 (0.0042)	0.0076 (0.0010)
Inverse vaccination	-6.3241 (2.5122)	-1.2688 (0.5665)
Stringency	-2.7433 (1.0310)	-0.4807 (0.1626)
Inverse vaccination * stringency	0.2009 (0.0677)	0.0349 (0.0105)
R2	0.90	0.88