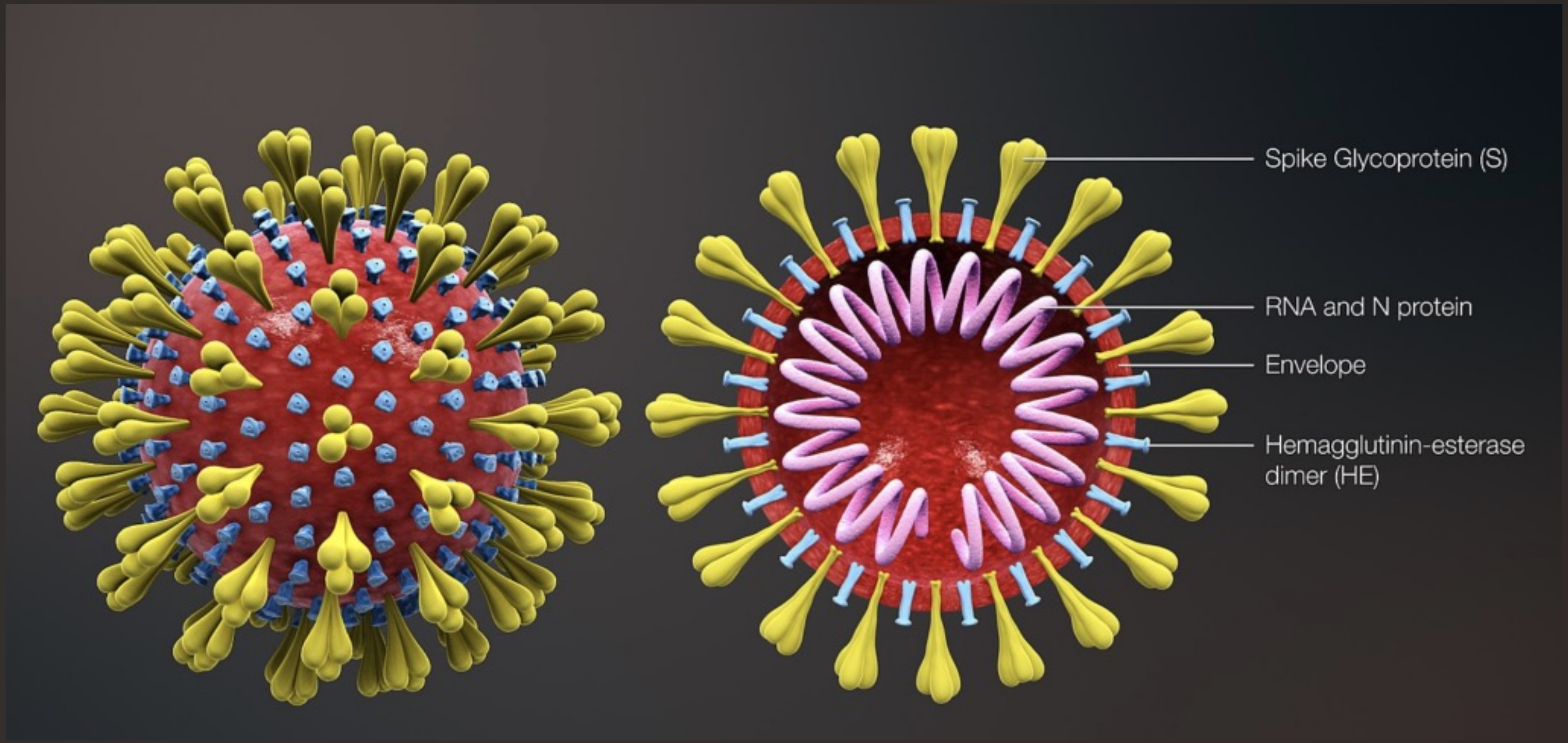
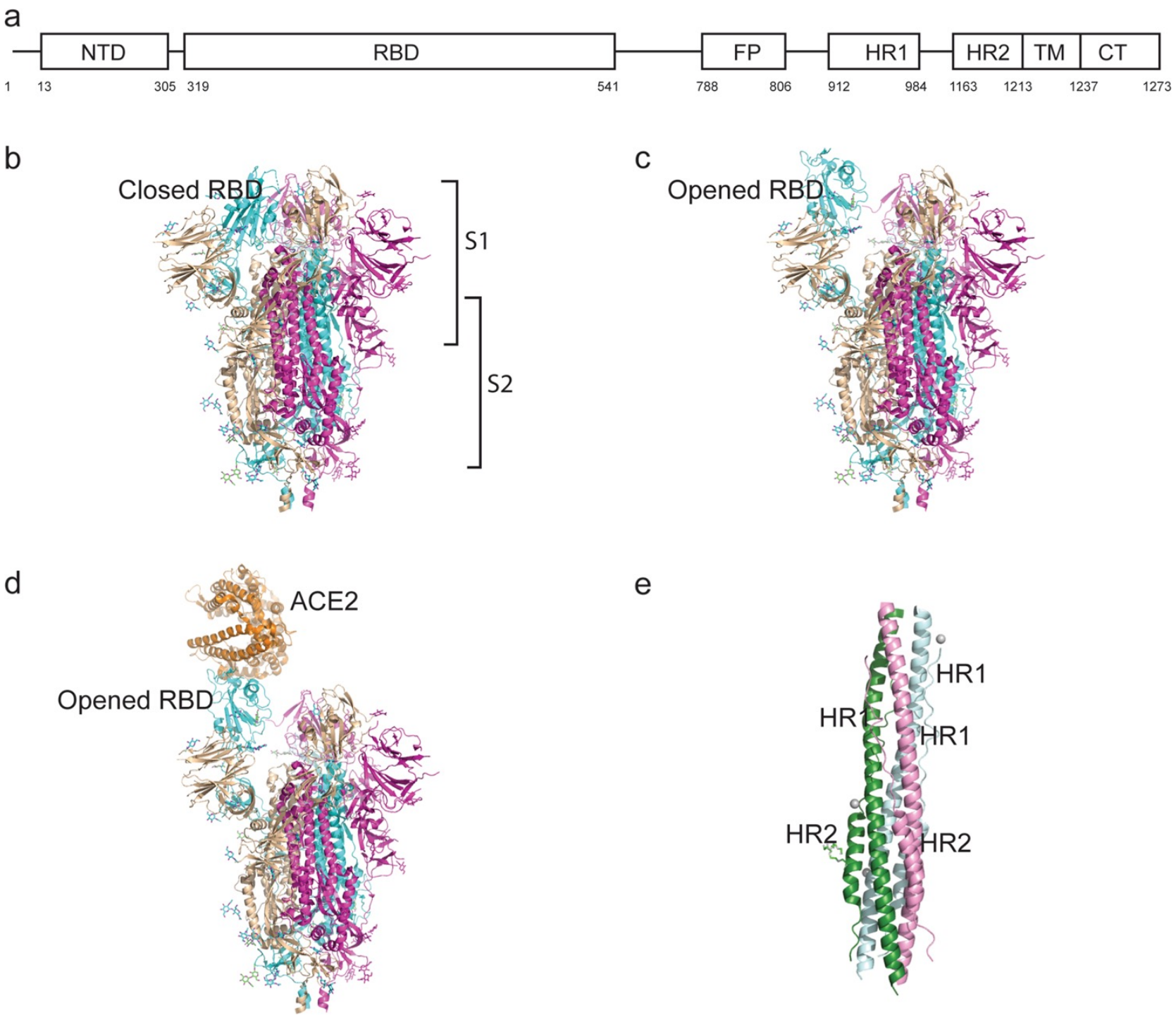
Covid-19 :
Immunité post-infectieuse et post-vaccinale

Olivier Epaulard
Infectiologie
CHU Grenoble Alpes

GERES - 26 novembre 2021


Spike Glycoprotein (S)
RNA and N protein
Envelope
Hemagglutinin-esterase dimer (HE)

Protéine Spike

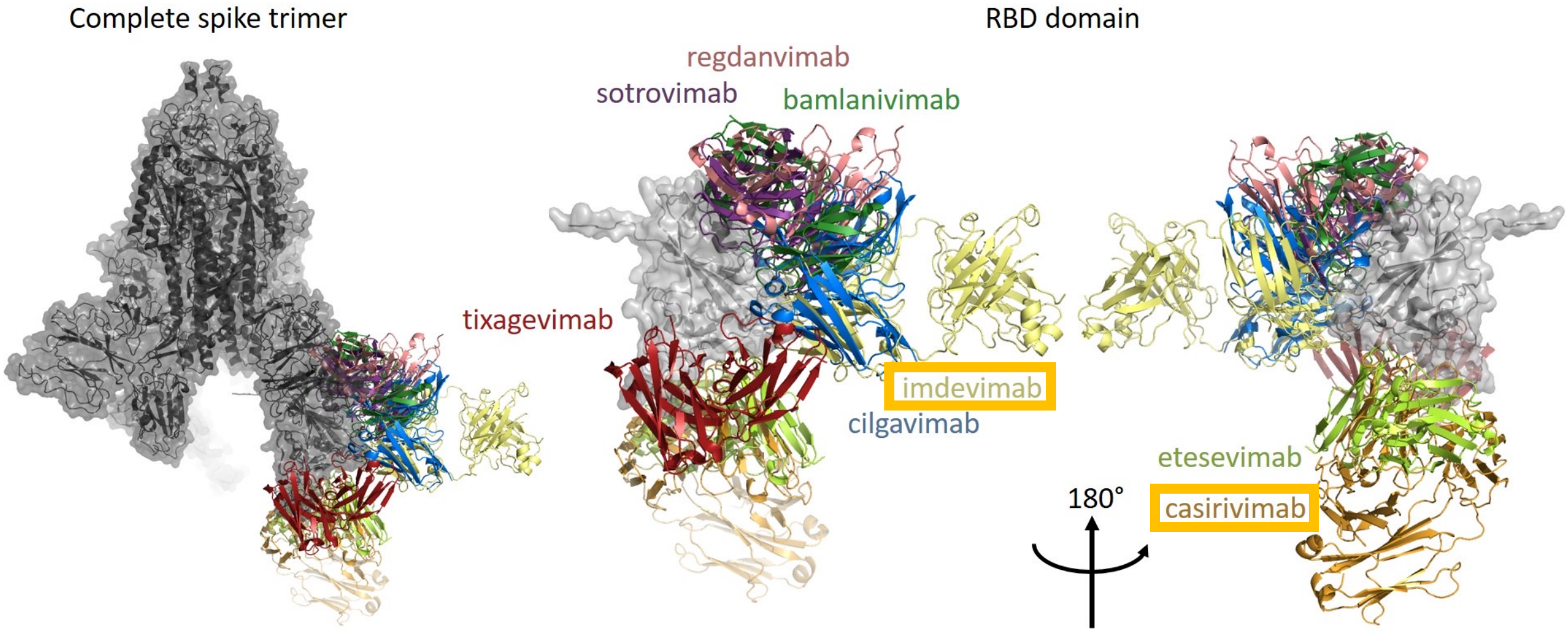


Huang Nature 2020

Fonction des anticorps *(en règle générale)*

- Anticorps neutralisants : interfère avec des facteurs de pathogénicité
  - Anticorps anti-toxine
  - Anticorps anti-molécules d'adhésions virales

- Anticorps non-neutralisants : opsonisation
  - Phagocytose
  - Ciblage par le complément (bactéries, protozoaires …)
  - Cytotoxicité à médiation cellulaire dépendante des anticorps (ADCC)


Complete spike trimer
RBD domain
regdanvimab
sotrovimab
bamlanivimab
tixagevimab
imdevimab
cilgavimab
etesevimab
180°
casirivimab

ARTICLES
https://doi.org/10.1038/s41591-021-01540-1

nature medicine

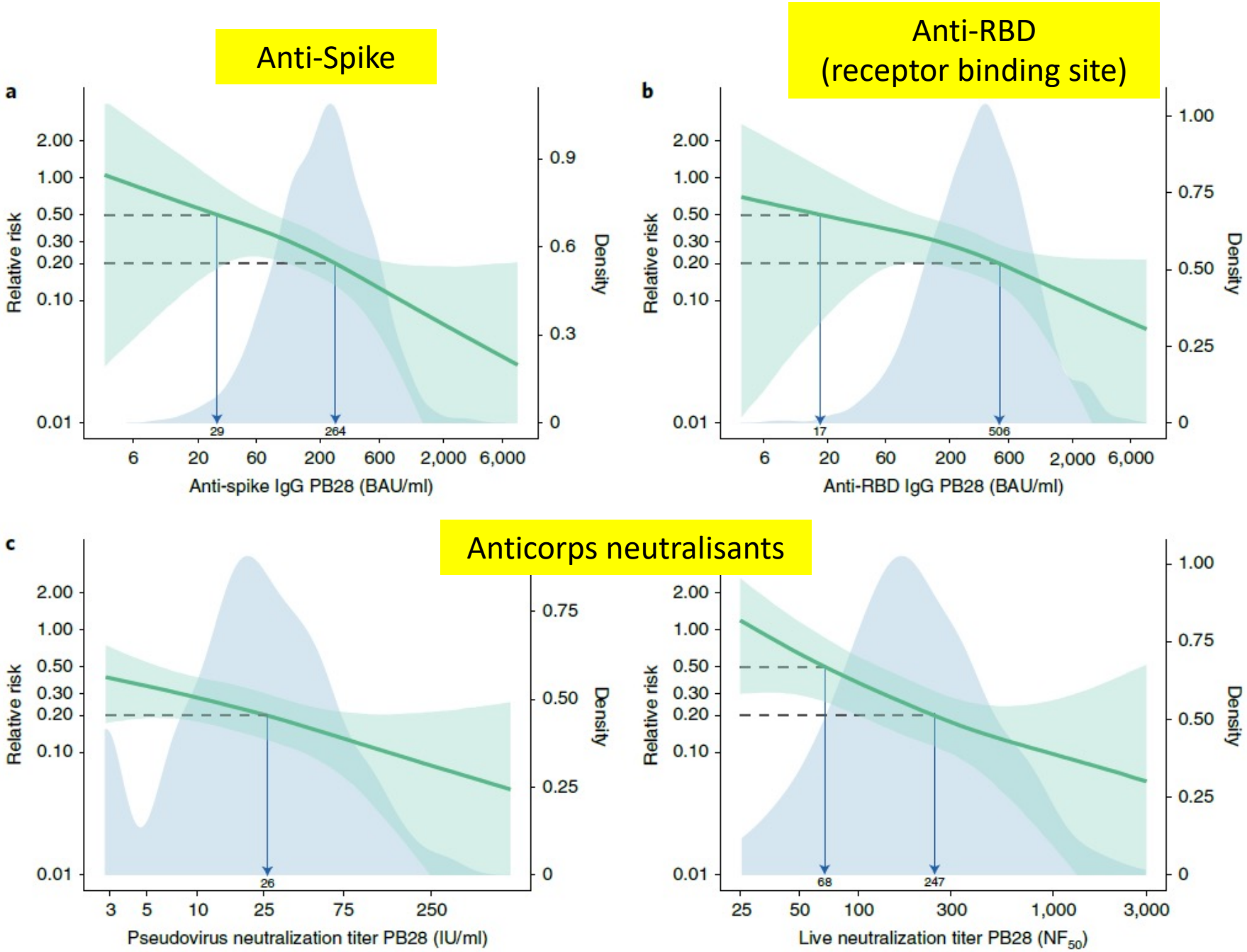
Check for updates

OPEN

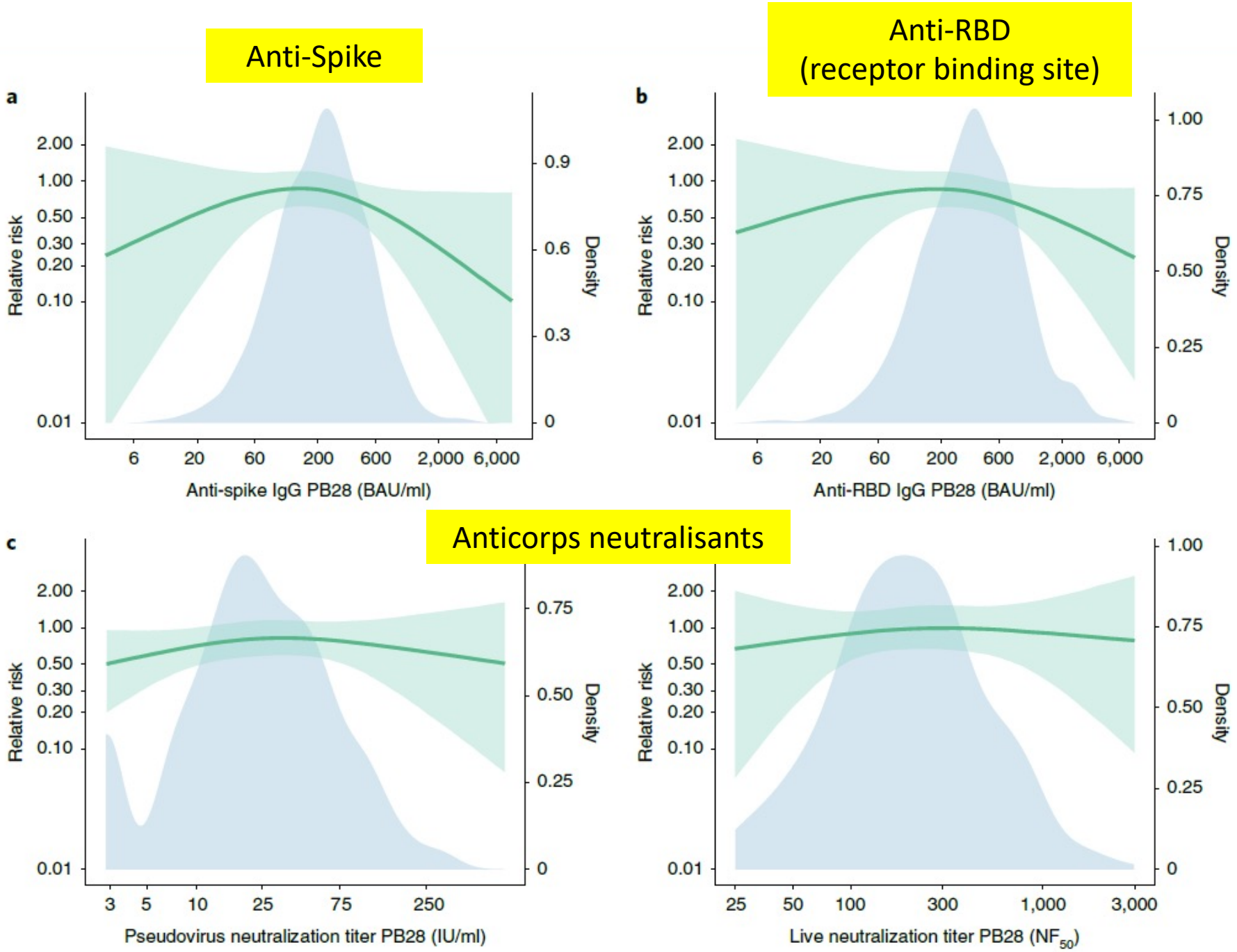
Correlates of protection against symptomatic and asymptomatic SARS-CoV-2 infection

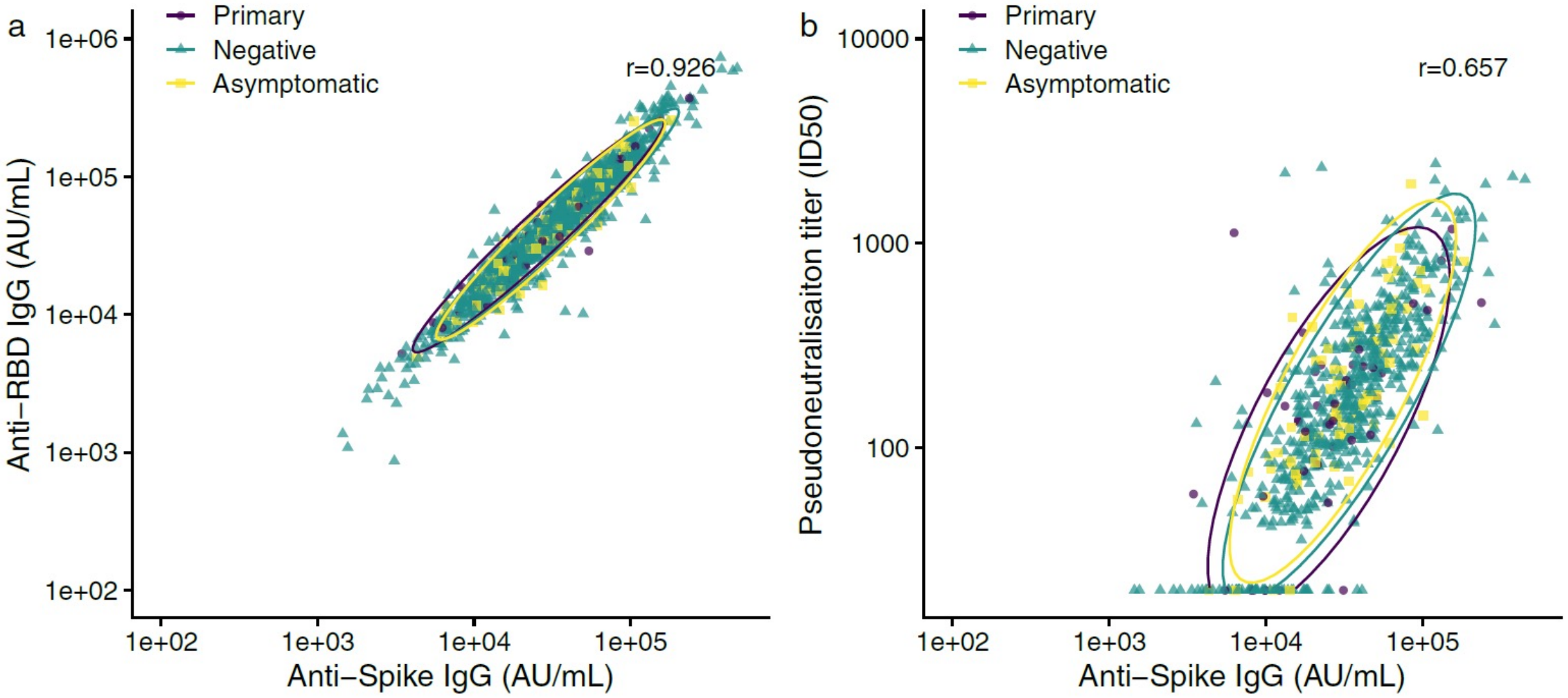
Shuo Feng[1], Daniel J. Phillips[1], Thomas White[2], Homesh Sayal[2], Parvinder K. Aley[1], Sagida Bibi[1], Christina Dold[1], Michelle Fuskova[3], Sarah C. Gilbert[3], Ian Hirsch[2], Holly E. Humphries[4], Brett Jepson[5,6], Elizabeth J. Kelly[7], Emma Plested[1], Kathryn Shoemaker[5], Kelly M. Thomas[4], Johan Vekemans[8], Tonya L. Villafana[5], Teresa Lambe[3,9,35], Andrew J. Pollard[1,10,35], Merryn Voysey[1,10,35] ✉ and the Oxford COVID Vaccine Trial Group*

Relation entre taux d'anticorps et risque d'infection symptomatique



Relation entre taux d'anticorps et risque d'infection asymptomatique




a
Primary
Negative
Asymptomatic
r=0.926
Anti−RBD IgG (AU/mL)
1e+06
1e+05
1e+04
1e+03
1e+02
1e+02
1e+03
1e+04
1e+05
Anti−Spike IgG (AU/mL)
b
Primary
Negative
Asymptomatic
r=0.657
Pseudoneutralisaiton titer (ID50)
10000
1000
100
1e+02
1e+03
1e+04
1e+05
Anti−Spike IgG (AU/mL)

Réponse post-infectieuse

Les coronavirus

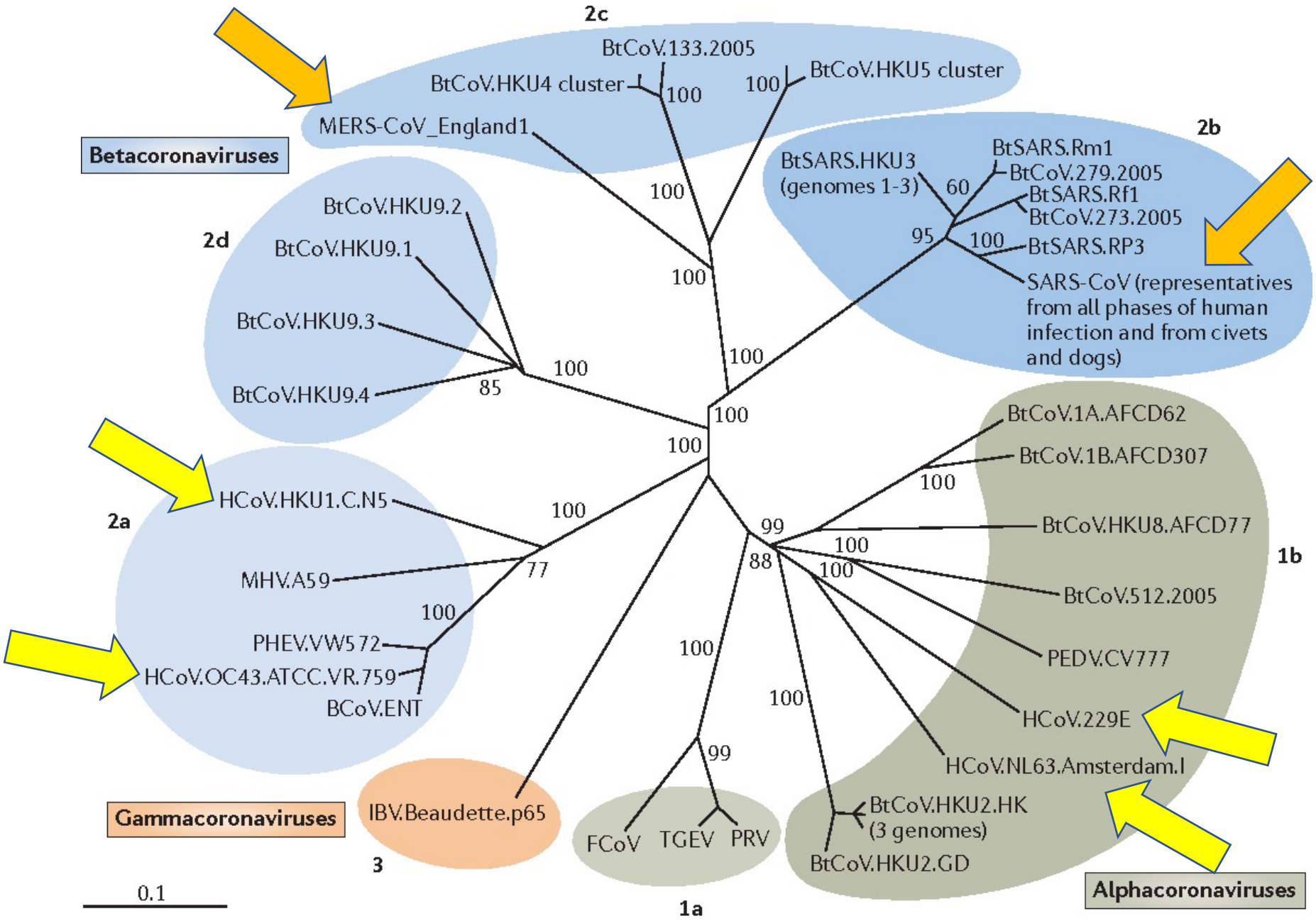


Figure 1 | **Whole-genome phylogeny of representative coronaviruses.** The full genomic sequences of 50 coronaviruses

Graham 2013

Wellcome Open Research 2021 Wellcome Open Research 2021, 6:138 Last updated: 14 OCT 2021

Check for updates

RESEARCH ARTICLE

Estimating the duration of seropositivity of human seasonal coronaviruses using seroprevalence studies [version 1; peer review: 1 approved, 2 approved with reservations]

Eleanor M. Rees[1,2], Naomi R. Waterlow[1],
Centre for the Mathematical Modelling of Infectious Diseases COVID-19 Working Group,
Rachel Lowe[1,2], Adam J. Kucharski[1]

[1]Centre for Mathematical Modelling of Infectious Diseases, London School of Hygiene & Tropical Medicine, London, UK
[2]Centre on Climate Change and Planetary Health, London School of Hygiene & Tropical Medicine, London, UK

Table 1. Characteristics of studies used to fit the model.

Strain	Author (year published)	Pubmed ID	Sample size	Country/ region	Years sampled	Assay
HCoV-HKU1	Chan (2009)	19342289	709	Hong Kong	Not specified	ELISA (IgG)
	Zhou (2013)[a]	24040960	789	China	1999 – 2011	IFA (IgG)
HCoV-OC43	Zhou (2013)[a]	24040960	789	China	1999 – 2011	IFA (IgG)
	Monto (1974)[c]	4816305	910	USA	1965 – 1969	CF or HAI
	Sarateanu (1980)	6248465	3,016	Germany	1974 – 1976	HI
HCoV-NL63	Shao (2007)[b]	17889596	243	USA	2003 – 2004	ELISA (IgG)
	Zhou (2013)[a]	24040960	789	China	1999 – 2011	IFA (IgG)
HCoV-229E	Shao (2007)[b]	17889596	243	USA	2003 – 2004	ELISA (IgG)
	Zhou (2013)[a]	24040960	789	China	1999 – 2011	IFA (IgG)
	Cavallaro (1970)[c]	5504709	307	USA	1965	Neutralization

Table 4. Comparison of duration of antibody persistence estimates from the different models explored.

Model	Reverse catalytic model with age-varying FOI (alpha and cut-off varying across settings) - More informed priors	Reverse catalytic model with age-varying FOI (alpha and cut-off varying across settings) - less informed priors	Reverse catalytic model with age-varying FOI (alpha and cut-off held across settings)	Reverse catalytic model
Duration of antibody persistence (years)	3.75 (1.96 – 7.38)	0.93 (0.60 – 1.64)	2.20 (1.57 – 3.08)	7.69 (6.25 – 9.09)

Duration of Antibody Responses after Severe Acute Respiratory Syndrome

2007

Li-Ping Wu,* Nai-Chang Wang,* Yi-Hua Chang,* Xiang-Yi Tian,* Dan-Yu Na,* Li-Yuan Zhang,* Lei Zheng,* Tao Lan,† Lin-Fa Wang,‡ and Guo-Dong Liang§

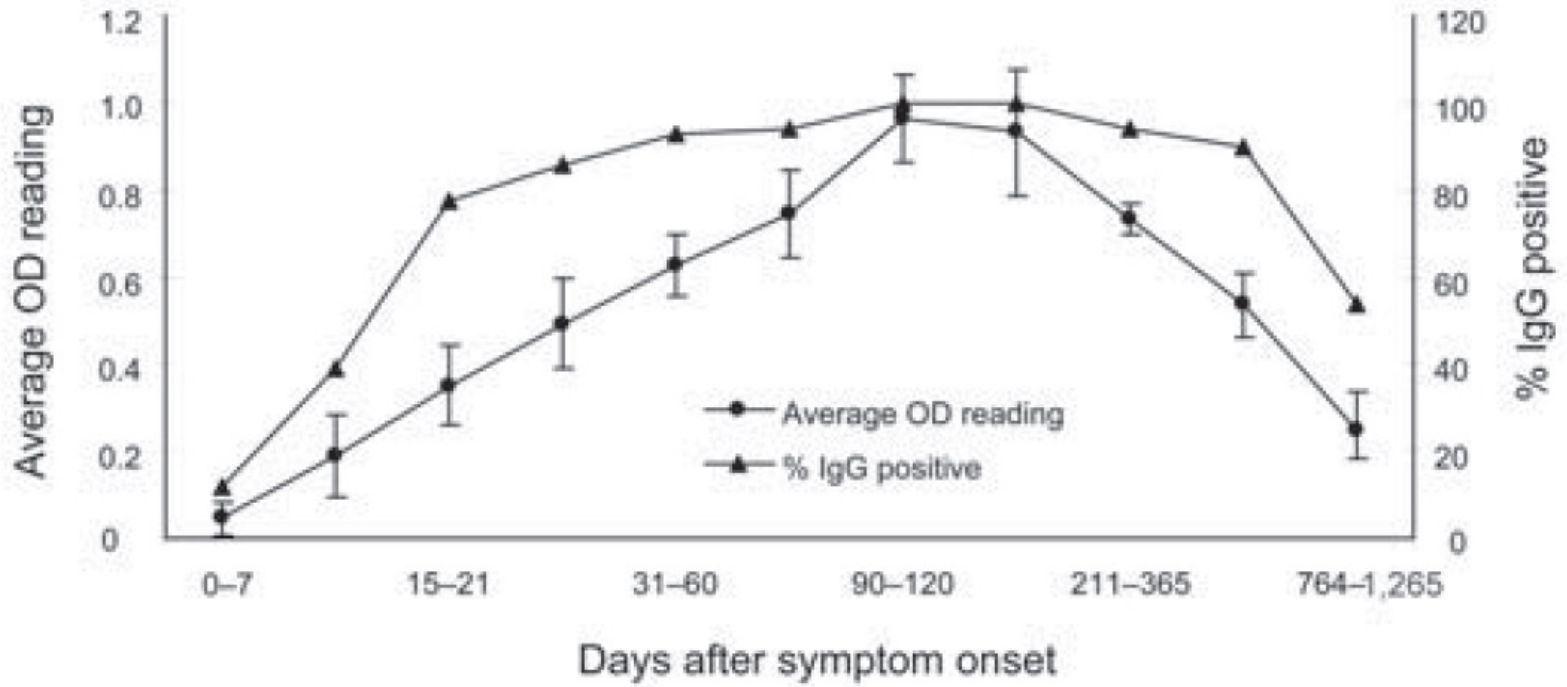
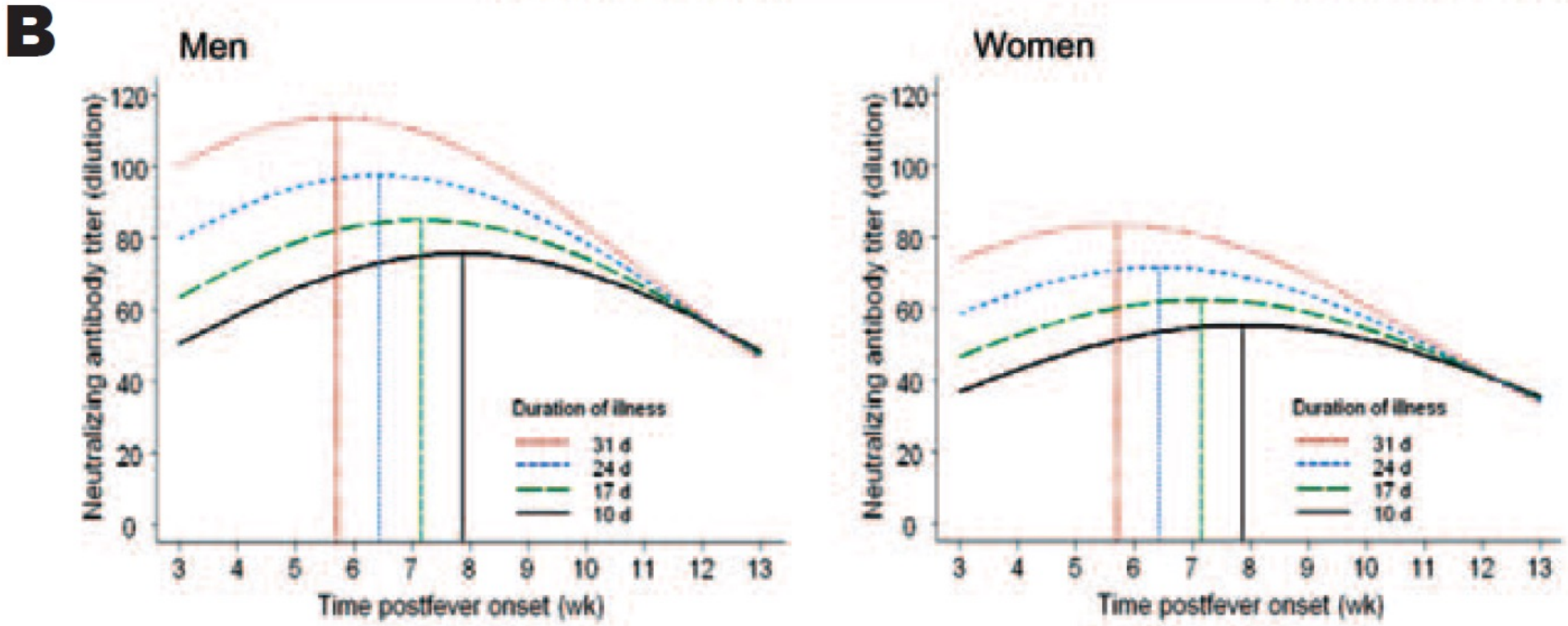


Figure 1. Change of immunoglobulin G (IgG) patterns among 176 convalescent severe acute respiratory syndrome patients

Neutralizing Antibody Response and SARS Severity

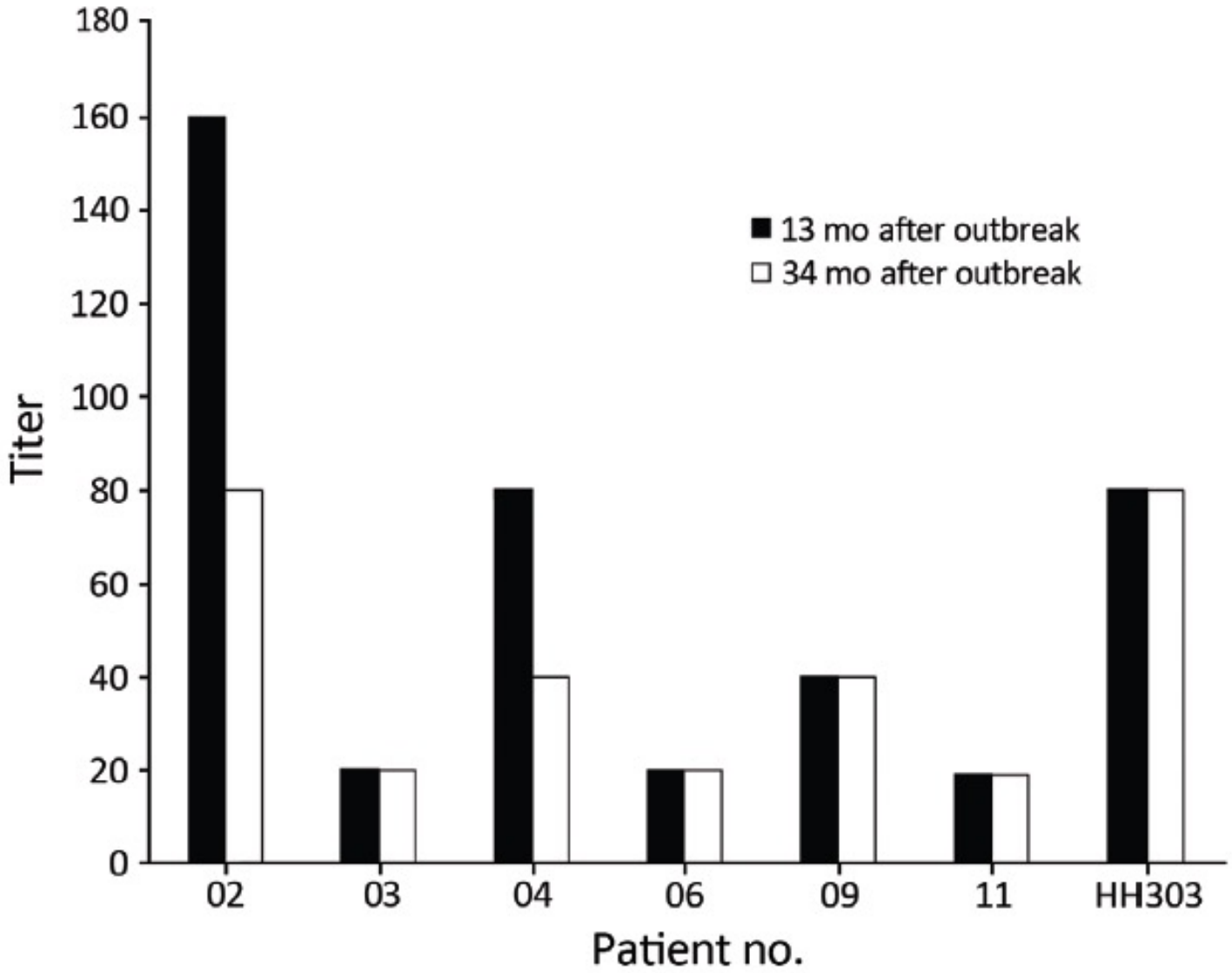
2005

Mei-Shang Ho,* Wei-Ju Chen,* Hour-Young Chen,† Szu-Fong Lin,† Min-Chin Wang,† Jiali Di,† Yen-Ta Lu,‡ Ching-Lung Liu,‡ Shan-Chwen Chang,§ Chung-Liang Chao,¶ Chwan-Chuen King,§ Jeng-Min Chiou,* Ih-Jen Su,# and Jyh-Yuan Yang†



Persistence of Antibodies against Middle East Respiratory Syndrome Coronavirus

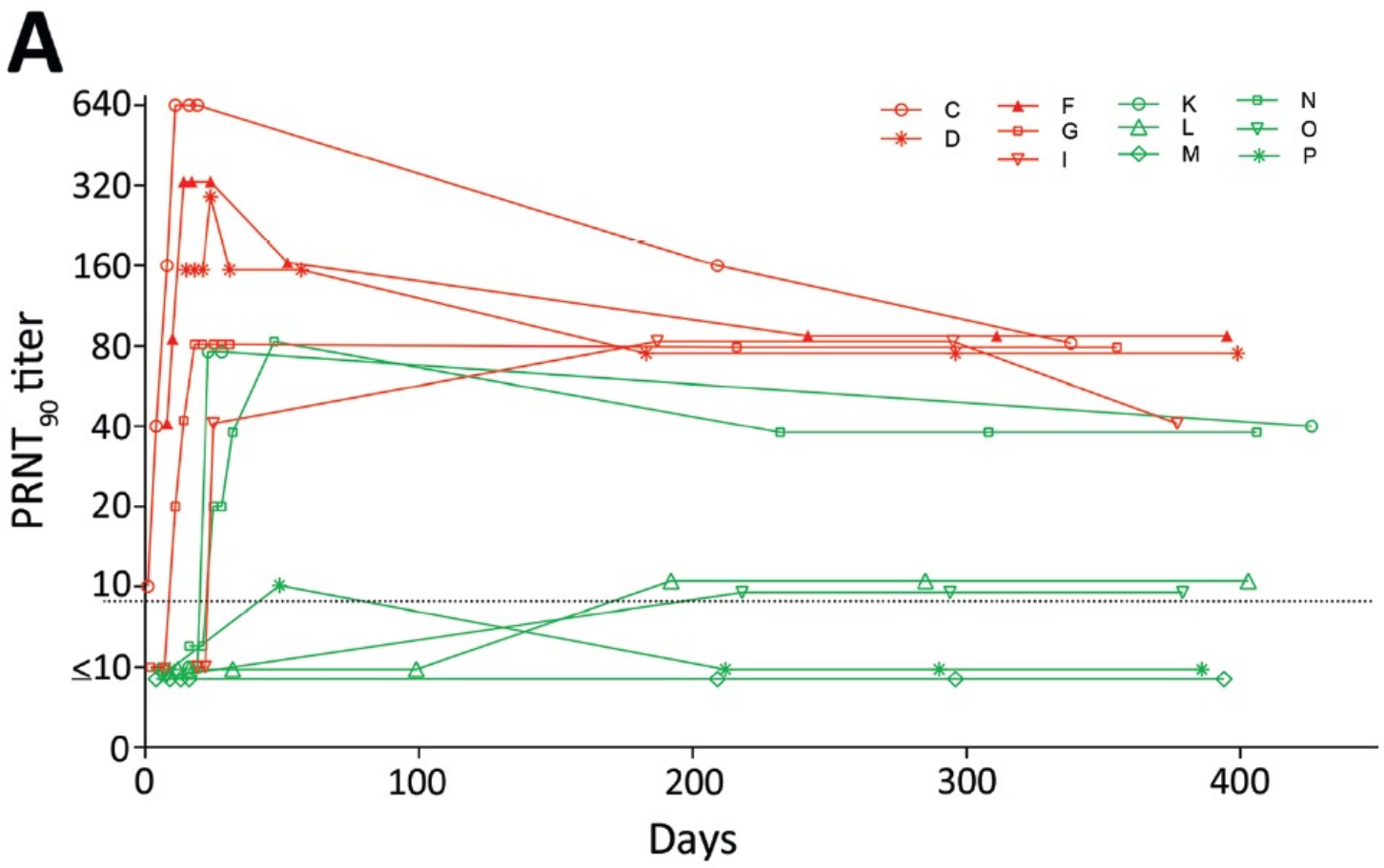
Daniel C. Payne, Ibrahim Iblan, Brian Rha, Sultan Alqasrawi, Aktham Haddadin, Mohannad Al Nsour, Tarek Alsanouri, Sami Sheikh Ali, Jennifer Harcourt, Congrong Miao, Azaibi Tamin, Susan I. Gerber, Lia M. Haynes, Mohammad Mousa Al Abdallat



MERS-CoV Antibody Responses 1 Year after Symptom Onset, South Korea, 2015

Pyoeng Gyun Choe,[1] R.A.P.M. Perera,[1] Wan Beom Park, Kyoung-Ho Song, Ji Hwan Bang, Eu Suk Kim, Hong Bin Kim, Long Wei Ronald Ko, Sang Won Park, Nam-Joong Kim, Eric H.Y. Lau, Leo L.M. Poon, Malik Peiris, Myoung-don Oh

2017



August 2021

Clinical Infectious Diseases

MAJOR ARTICLE

IDSA Infectious Diseases Society of America

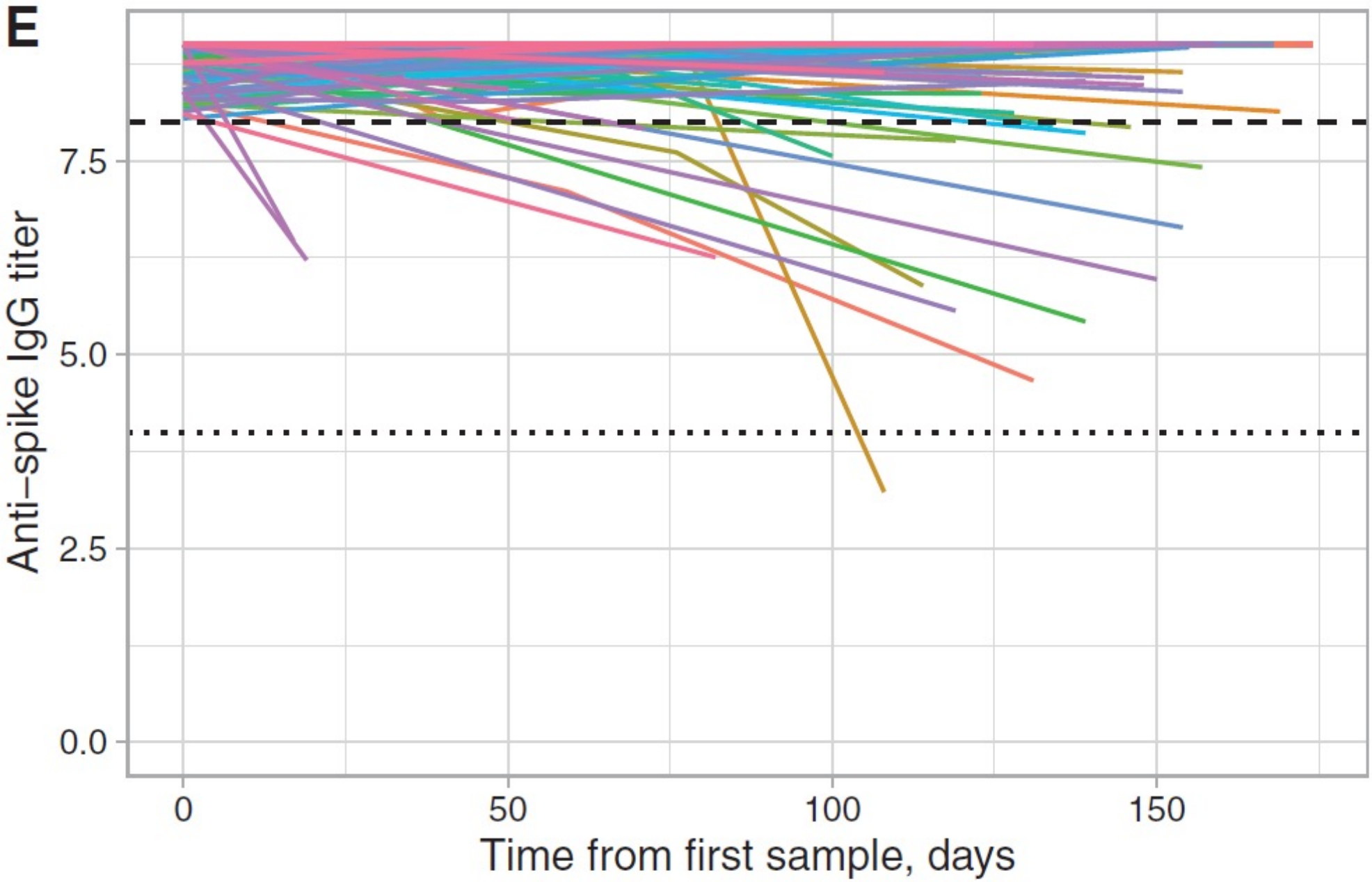
hivma hiv medicine association

OXFORD

The Duration, Dynamics, and Determinants of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Antibody Responses in Individual Healthcare Workers

Sheila F. Lumley,[1,3,a] Jia Wei,[2,3,a] Denise O'Donnell,[3] Nicole E. Stoesser,[3,4,5] Philippa C. Matthews,[3,4,5] Alison Howarth,[3] Stephanie B Hatch,[3] Brian D. Marsden,[3,6] Stuart Cox,[1] Tim James,[1] Liam J. Peck,[7] Thomas G Ritter,[7] Zoe de Toledo,[7] Richard J Cornall,[3] E Yvonne Jones,[3] David I Stuart,[3] Gavin Screaton,[3] Daniel Ebner,[3,8] Sarah Hoosdally,[3,4,5] Derrick W. Crook,[3,4,5] Christopher P. Conlon,[3] Koen B. Pouwels,[5,9] A Sarah Walker,[3,4,5] Tim EA Peto,[3,4,5] Timothy M. Walker,[3,10] Katie Jeffery,[1] and David W. Eyre,[2,4,5,11]; Oxford University Hospitals Staff Testing Group

[1]Oxford University Hospitals NHS Foundation Trust, Oxford, United Kingdom; [2]Big Data Institute, University of Oxford, Oxford, United Kingdom; [3]Nuffield Department of Medicine, University of Oxford, Oxford, United Kingdom; [4]National Institute for Health Research (NIHR) Oxford Biomedical Research Centre, University of Oxford, Oxford, United Kingdom; [5]NIHR Health Protection Research Unit in Healthcare Associated Infections and Antimicrobial Resistance at University of Oxford in partnership with Public Health England, Oxford, United Kingdom; [6]Kennedy Institute of Rheumatology Research, University of Oxford, United Kingdom; [7]Medical School, University of Oxford, Oxford, United Kingdom; [8]Target Discovery Institute, University of Oxford, Oxford, United Kingdom; [9]Health Economics Research Centre, Nuffield Department of Population Health, University of Oxford, Oxford, United Kingdom; [10]Oxford University Clinical Research Unit, Ho Chi Minh City, Vietnam; and [11]Nuffield Department of Population Health, University of Oxford, Oxford, United Kingdom


E
Anti−spike IgG titer
7.5
5.0
2.5
0.0
0
50
100
150
Time from first sample, days

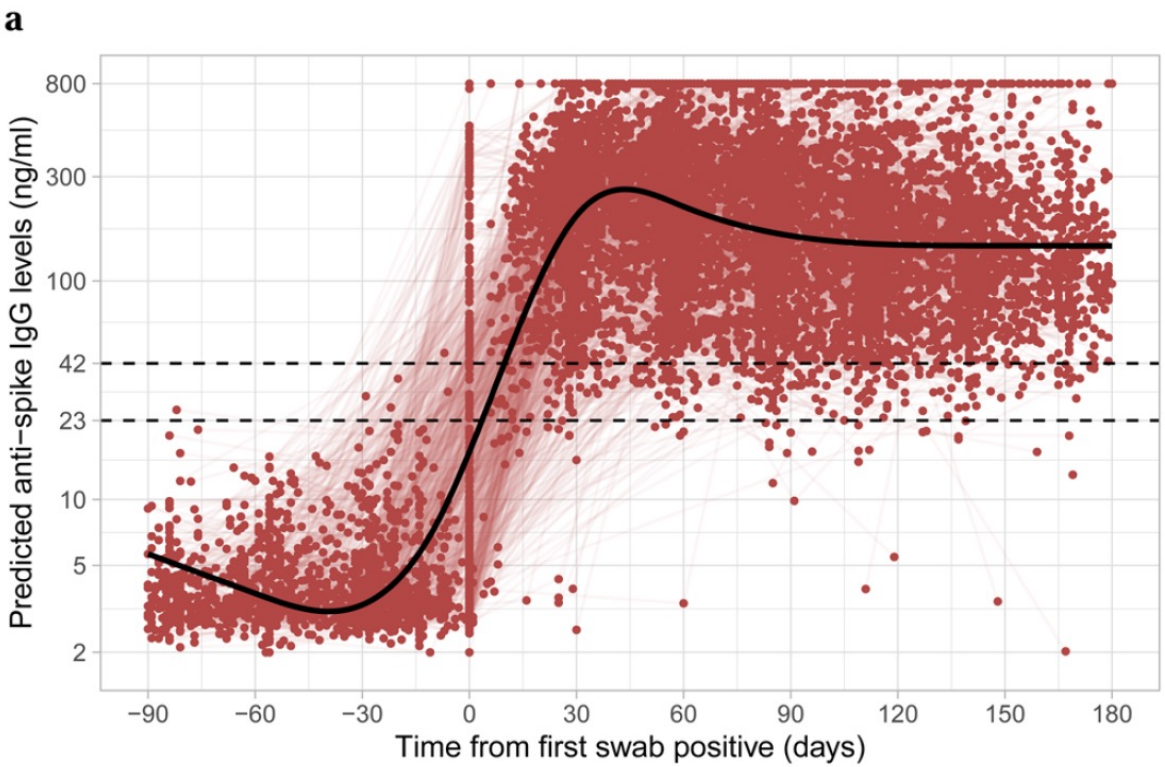
nature COMMUNICATIONS

ARTICLE

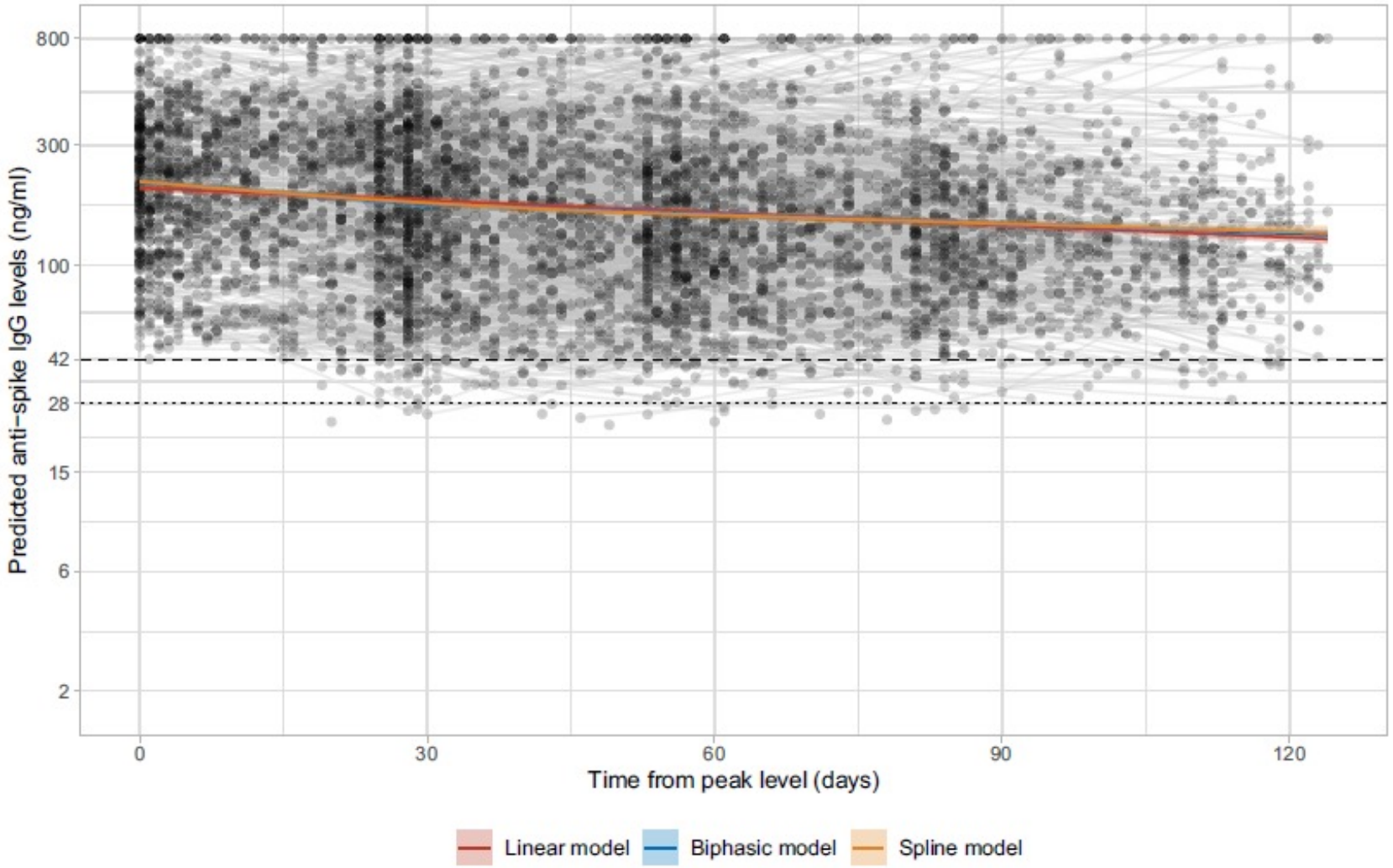
https://doi.org/10.1038/s41467-021-26479-2 OPEN

Anti-spike antibody response to natural SARS-CoV-2 infection in the general population

Jia Wei[1,2], Philippa C. Matthews[1,3], Nicole Stoesser[1,3,4,5], Thomas Maddox[6], Luke Lorenzi[6], Ruth Studley[6], John I. Bell[7], John N. Newton[8], Jeremy Farrar[9], Ian Diamond[6], Emma Rourke[6], Alison Howarth[1,5], Brian D. Marsden[1,10], Sarah Hoosdally[1], E. Yvonne Jones[1], David I. Stuart[1], Derrick W. Crook[1,3,4,5], Tim E. A. Peto[1,3,4,5], Koen B. Pouwels[1,2,4,11,22], A. Sarah Walker[1,2,4,12,22], David W. Eyre[2,3,4,5,22]✉ & the COVID-19 Infection Survey team*



Demi-vie des anticorps anti-Spike sur les 6 premiers mois : 184 jours

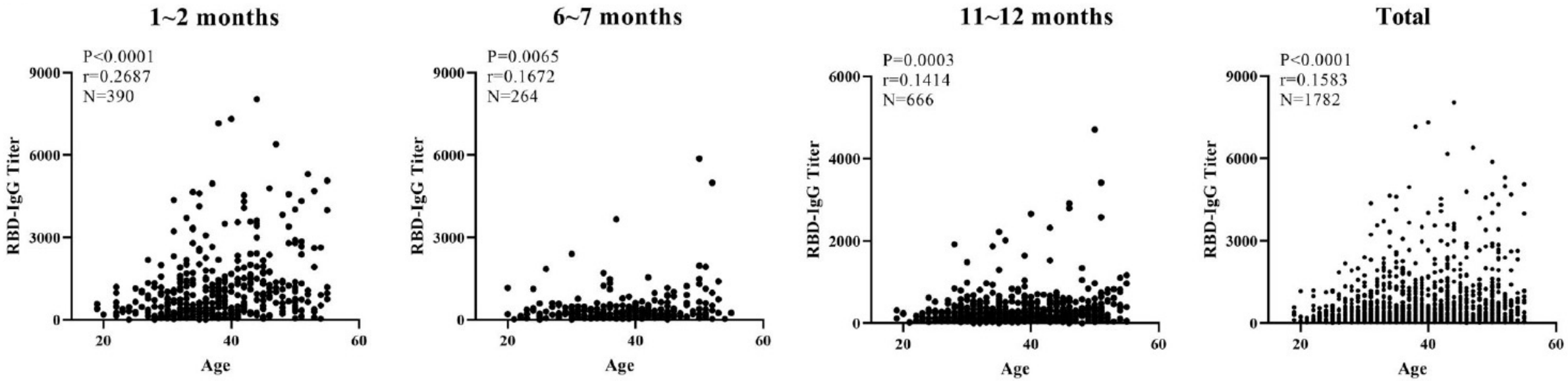


ARTICLE

https://doi.org/10.1038/s41467-021-24230-5 OPEN

Twelve-month specific IgG response to SARS-CoV-2 receptor-binding domain among COVID-19 convalescent plasma donors in Wuhan

Cesheng Li[1,7], Ding Yu[2,3,7], Xiao Wu[1], Hong Liang[2,3], Zhijun Zhou[1], Yong Xie[1,3], Taojing Li[3], Junzheng Wu[2], Fengping Lu[1], Lu Feng[1], Min Mao[1], Lianzhen Lin[1], Huanhuan Guo[1], Shenglan Yue[1], Feifei Wang[1], Yan Peng[1], Yong Hu[1], Zejun Wang[4], Jianhong Yu[1], Yong Zhang[3], Jia Lu[4], Haoran Ning[1], Huichuan Yang[5], Daoxing Fu[3], Yanlin He[1,3], Dongbo Zhou[3], Tao Du[3], Kai Duan[4], Demei Dong[3], Kun Deng[1], Xia Zou[1], Ya Zhang[1], Rong Zhou[3], Yang Gao[3], Xinxin Zhang[6,8]✉ & Xiaoming Yang[5,8]✉



Journal of Autoimmunity 123 (2021) 102703

Contents lists available at ScienceDirect

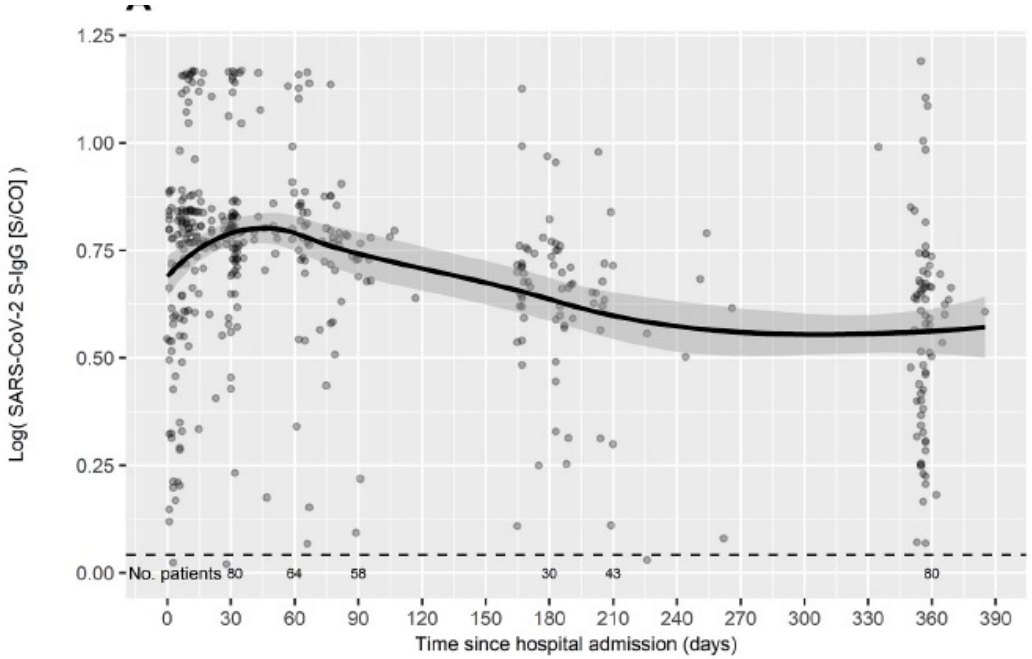
Journal of Autoimmunity

journal homepage: www.elsevier.com/locate/jautimm

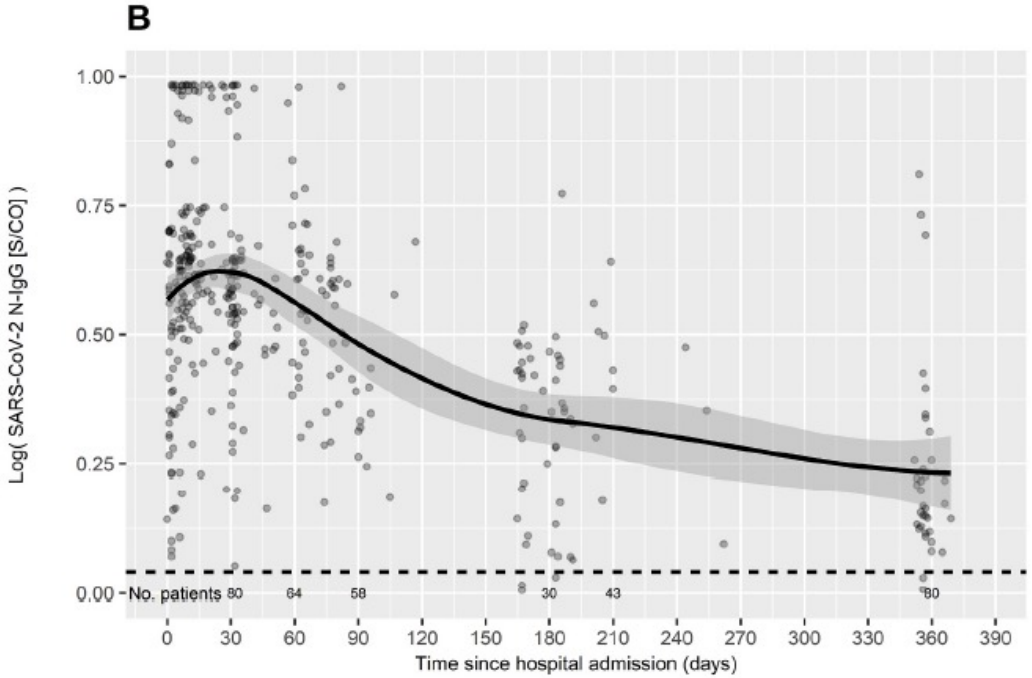
Durable antibody response one year after hospitalization for COVID-19: A longitudinal cohort study

Mar Masiá [a,b,*], Marta Fernández-González [a], Guillermo Telenti [a], Vanesa Agulló [a], José A. García [a], Sergio Padilla [a,b], Javier García-Abellán [a], Antonio Galiana [c], Nieves Gonzalo-Jiménez [c], Félix Gutiérrez [a,b,**]

Spike



Nucleocapside



EBioMedicine

journal homepage: www.elsevier.com/locate/ebiom

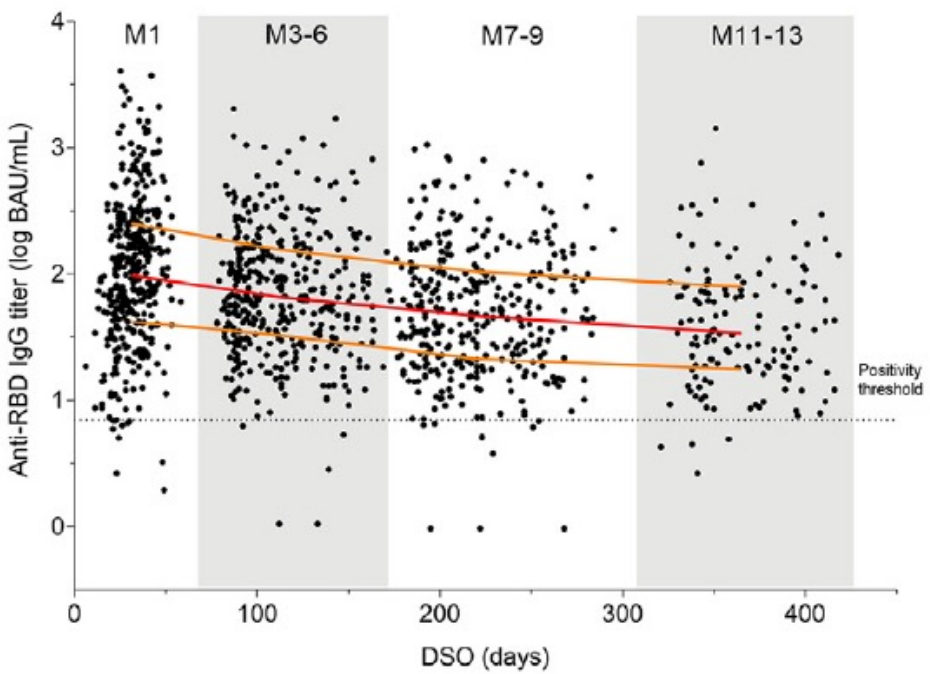
Received june 2021

Research paper

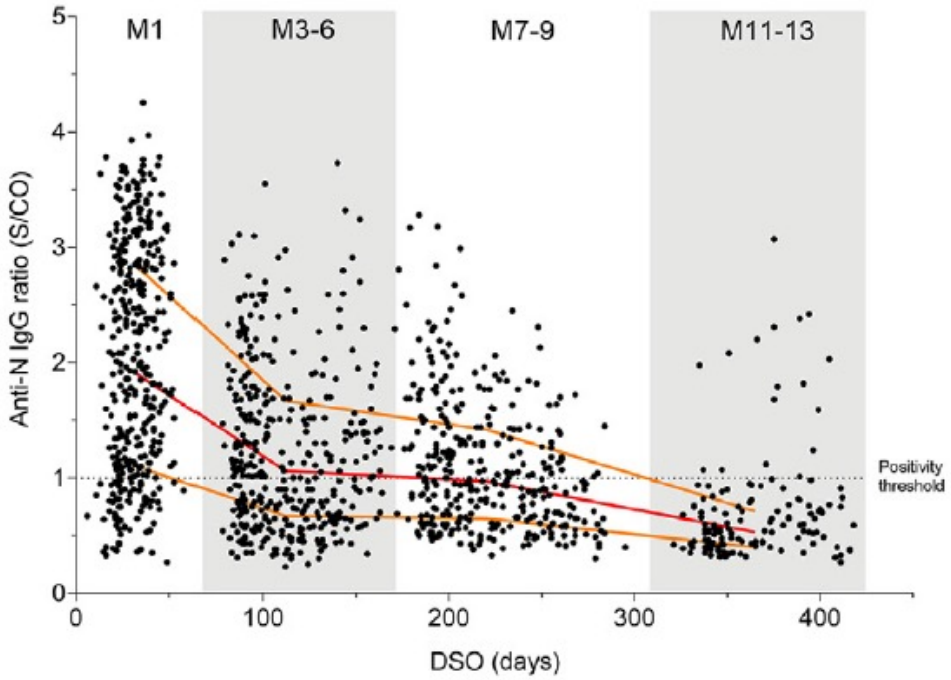
Evolution of antibody responses up to 13 months after SARS-CoV-2 infection and risk of reinfection

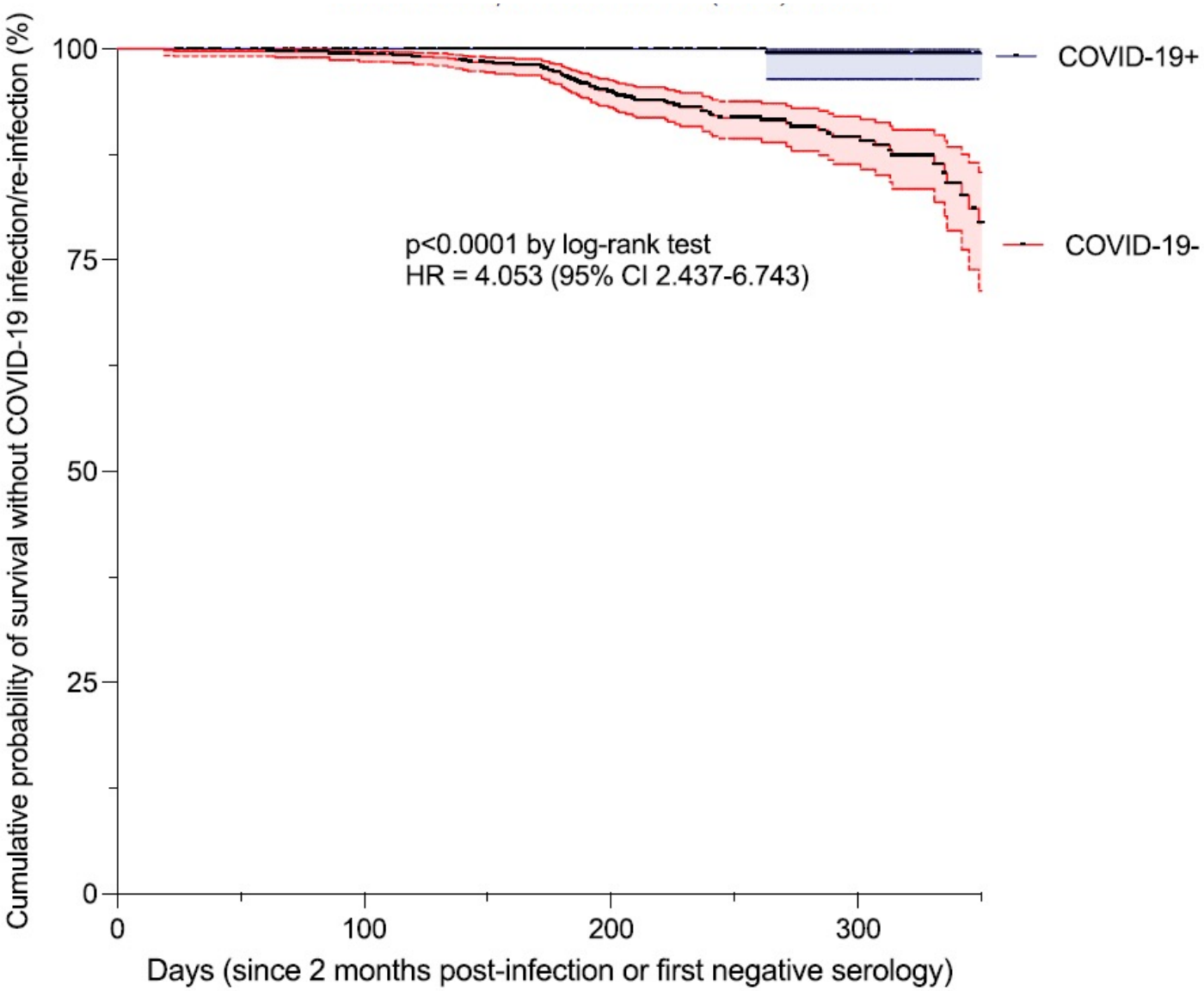
Floriane Gallais[a,b], Pierre Gantner[a,b], Timothée Bruel[c,d,e], Aurélie Velay[a,b], Delphine Planas[c,d,e], Marie-Josée Wendling[a], Sophie Bayer[f], Morgane Solis[a,b], Elodie Laugel[a,b], Nathalie Reix[f], Anne Schneider[g], Ludovic Glady[f], Baptiste Panaget[a,b], Nicolas Collongues[h], Marialuisa Partisani[i], Jean-Marc Lessinger[f], Arnaud Fontanet[j,k], David Rey[i], Yves Hansmann[l], Laurence Kling-Pillitteri[m], Olivier Schwartz[c,d,e], Jérome De Sèze[h], Nicolas Meyer[n], Maria Gonzalez[m], Catherine Schmidt-Mutter[h], Samira Fafi-Kremer[a,b,*]

Anti-RBD dynamics

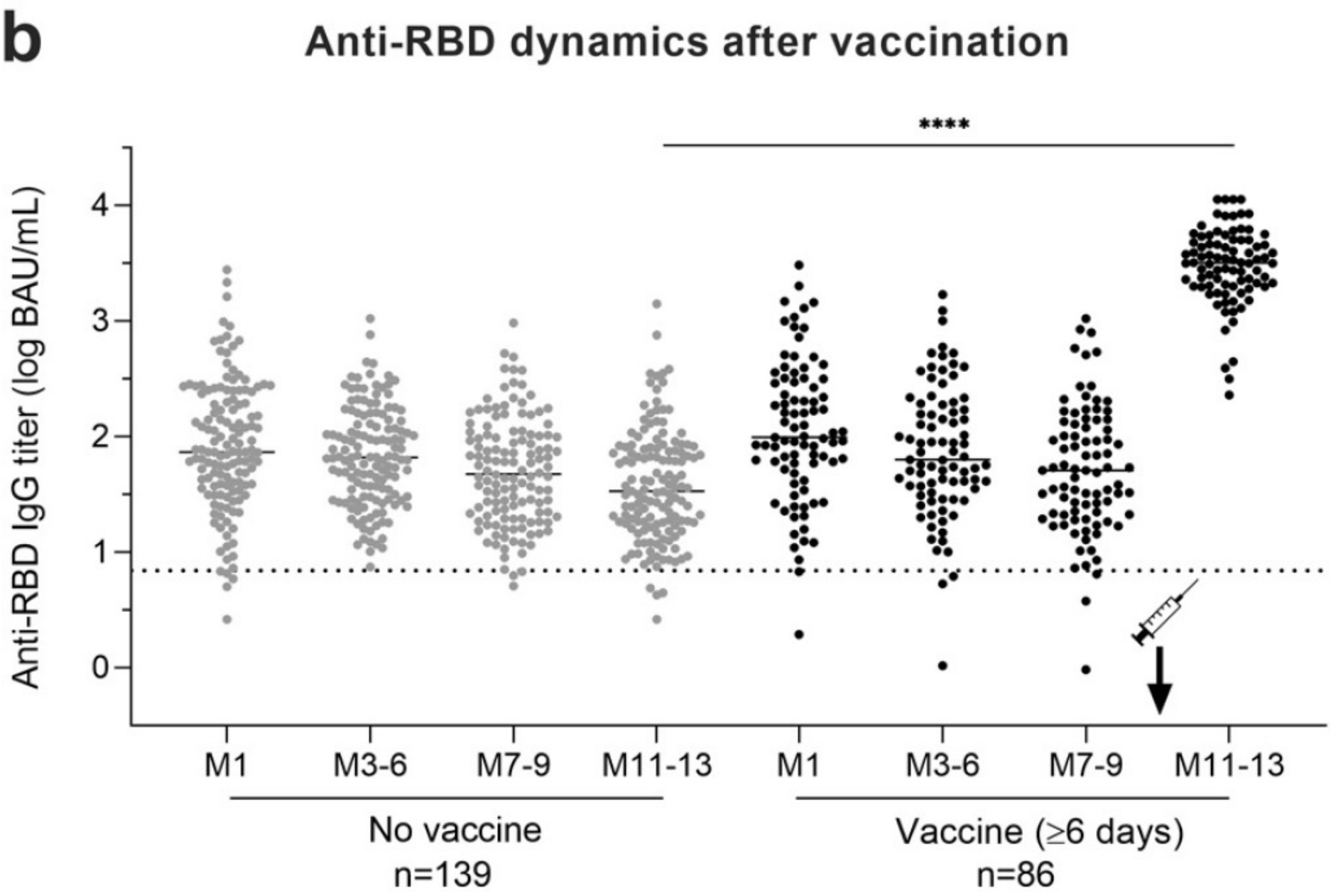


Anti-N dynamics





No. at risk				
COVID-19+	393	361	255	102
COVID-19-	916	844	578	199


b
Anti-RBD dynamics after vaccination
****
Anti-RBD IgG titer (log BAU/mL)
4
3
2
1
0
M1
M3-6
M7-9
M11-13
M1
M3-6
M7-9
M11-13
No vaccine
n=139
Vaccine (≥6 days)
n=86

October 2021

Journal of Infection xxx (xxxx) xxx

Contents lists available at ScienceDirect

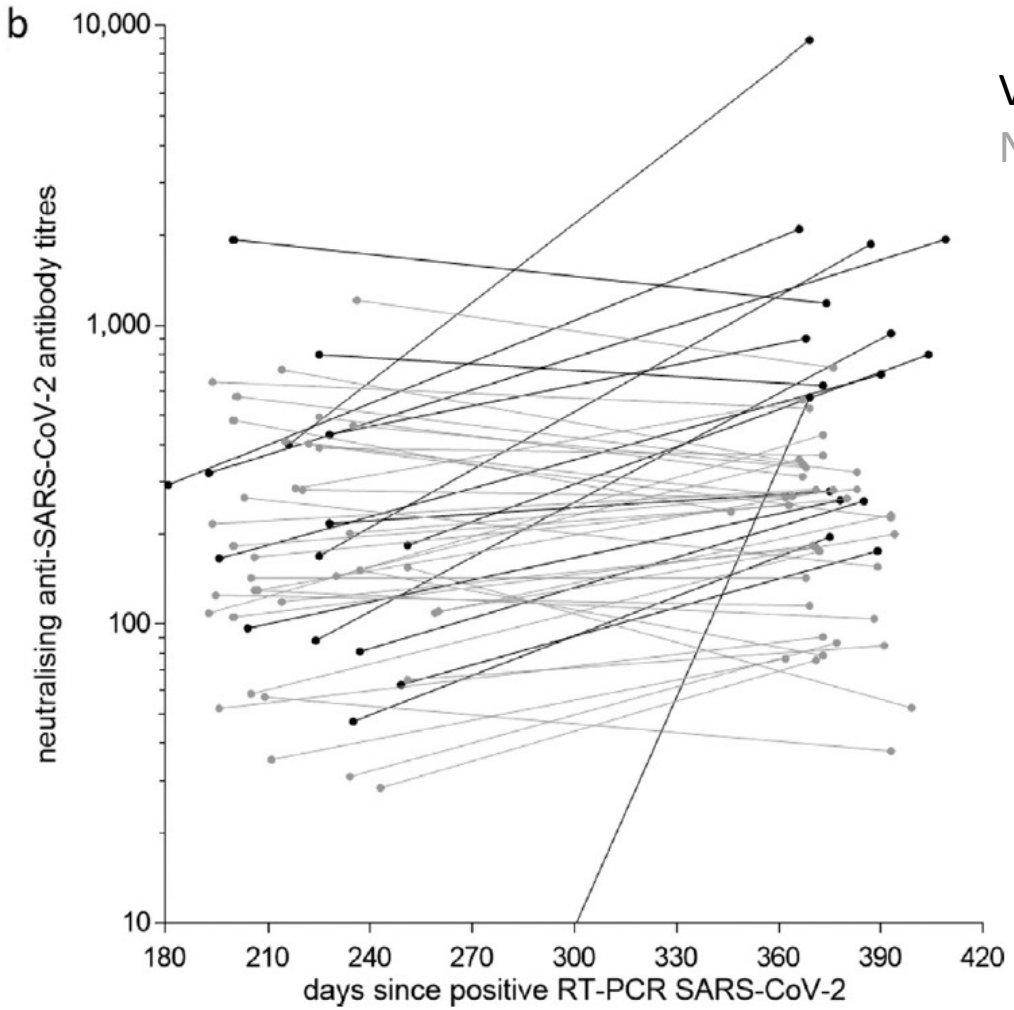
Journal of Infection

journal homepage: www.elsevier.com/locate/jinf

Epaulard et al

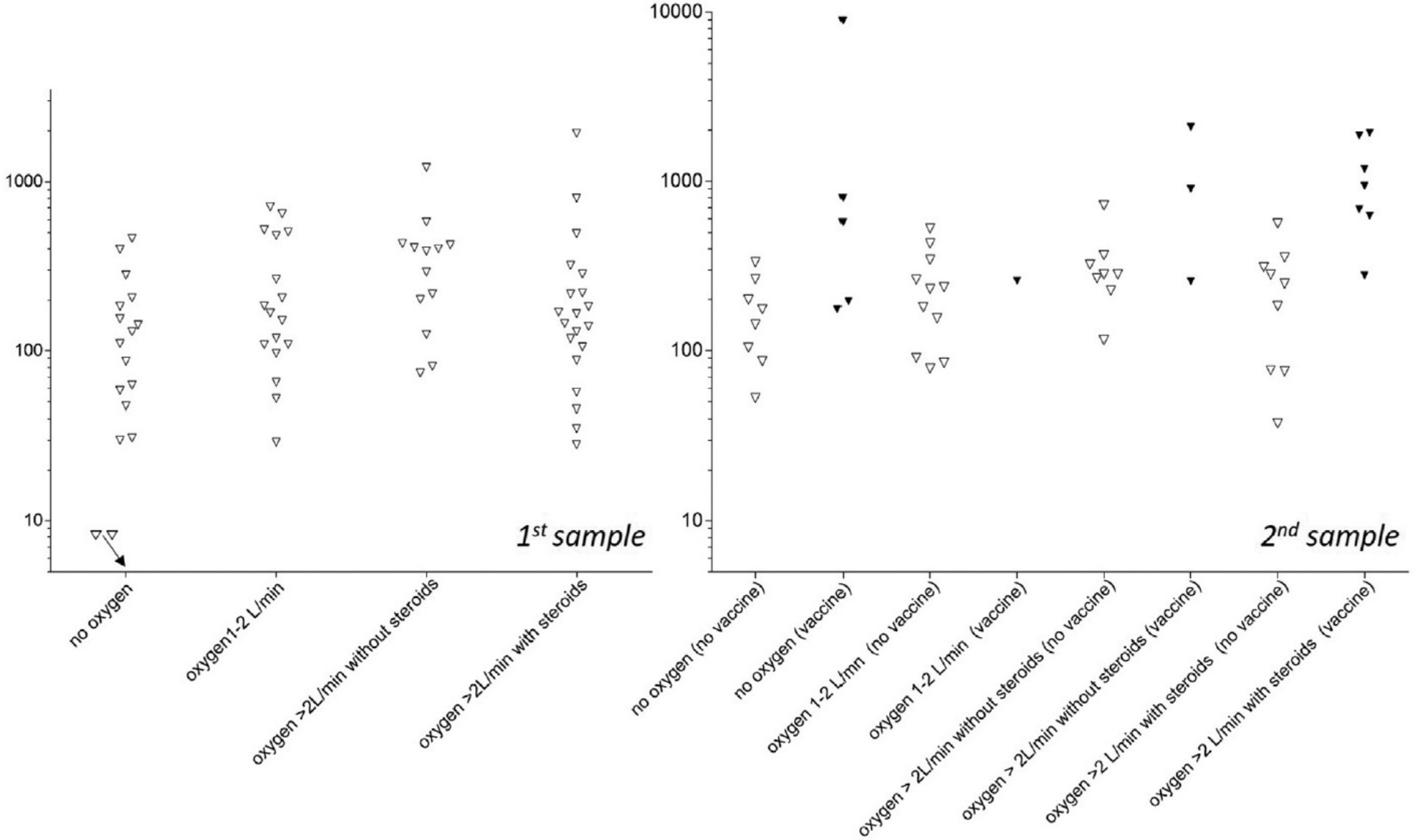
Letter to the Editor

Persistence at one year of neutralizing antibodies after SARS-CoV-2 infection: Influence of initial severity and steroid use



Vaccinated between M6 and M12

Not vaccinated


1000
100
10
1st sample
no oxygen
oxygen1-2 L/min
oxygen >2L/min without steroids
oxygen >2L/min with steroids
10000
1000
100
10
2nd sample
no oxygen (no vaccine)
no oxygen (vaccine)
oxygen 1-2 L/mn (no vaccine)
oxygen 1-2 L/min (vaccine)
oxygen > 2L/min without steroids (no vaccine)
oxygen > 2L/min without steroids (vaccine)
oxygen > 2L/min with steroids (no vaccine)
oxygen >2 L/min with steroids (vaccine)

European Journal of Immunology

Immunity to infection

Research Article

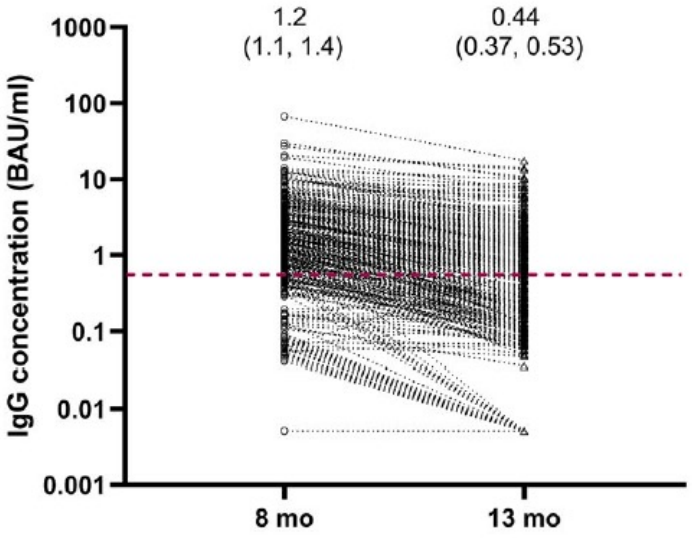
Persistence of neutralizing antibodies a year after SARS-CoV-2 infection in humans

Anu Haveri[#1], Nina Ekström[#1], Anna Solastie[1], Camilla Virta[1], Pamela Österlund[1], Elina Isosaari[2], Hanna Nohynek[1], Arto A Palmu[2] and Merit Melin[1]

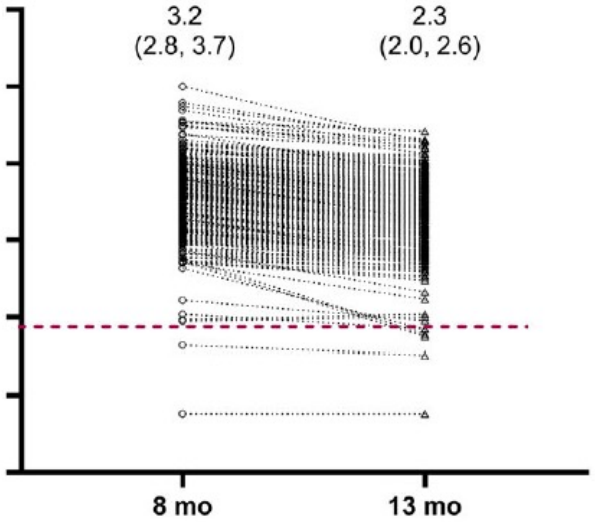
[1] Department of Health Security, Finnish Institute for Health and Welfare, Helsinki, Finland
[2] Department of Public Health and Welfare, Finnish Institute for Health and Welfare, Helsinki, Finland

Received July 2021

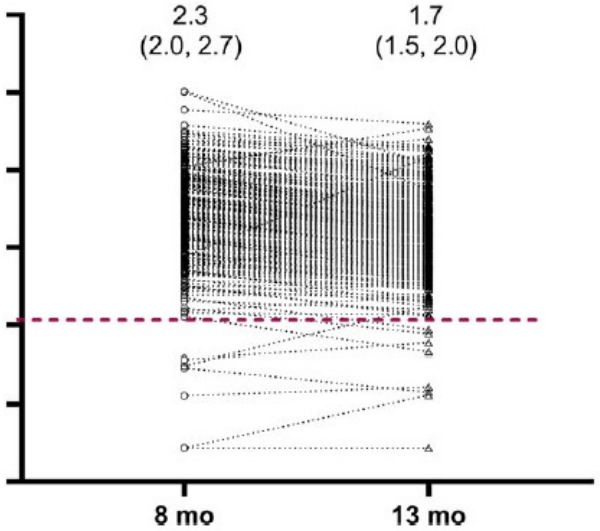
nucleocapside

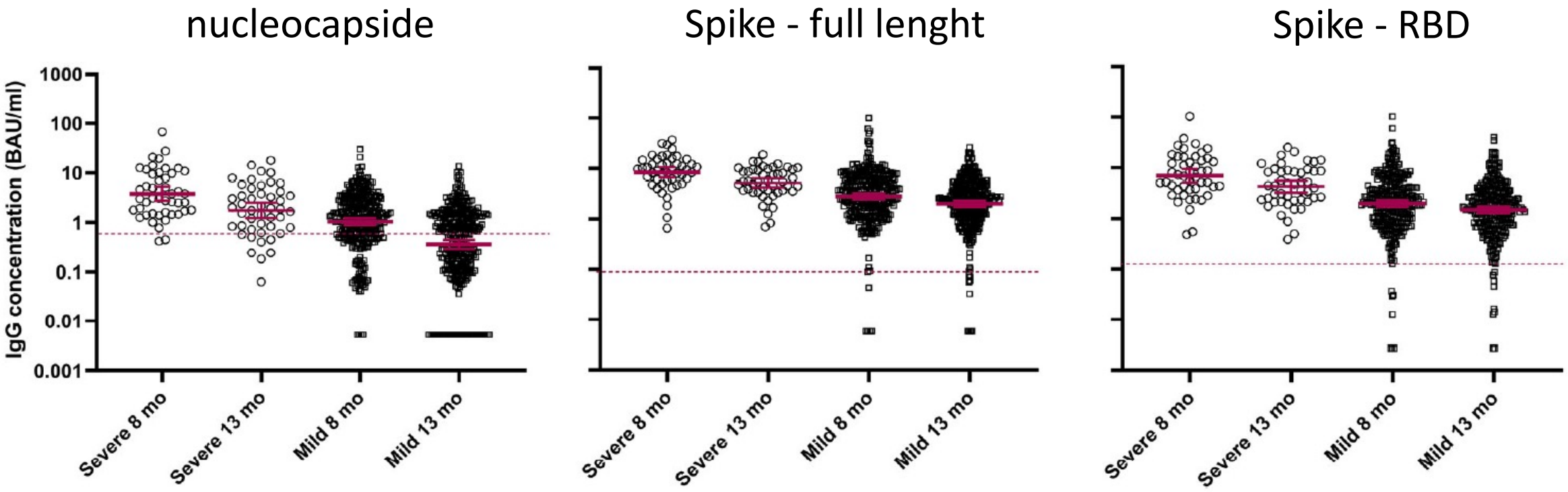


Spike - full lenght

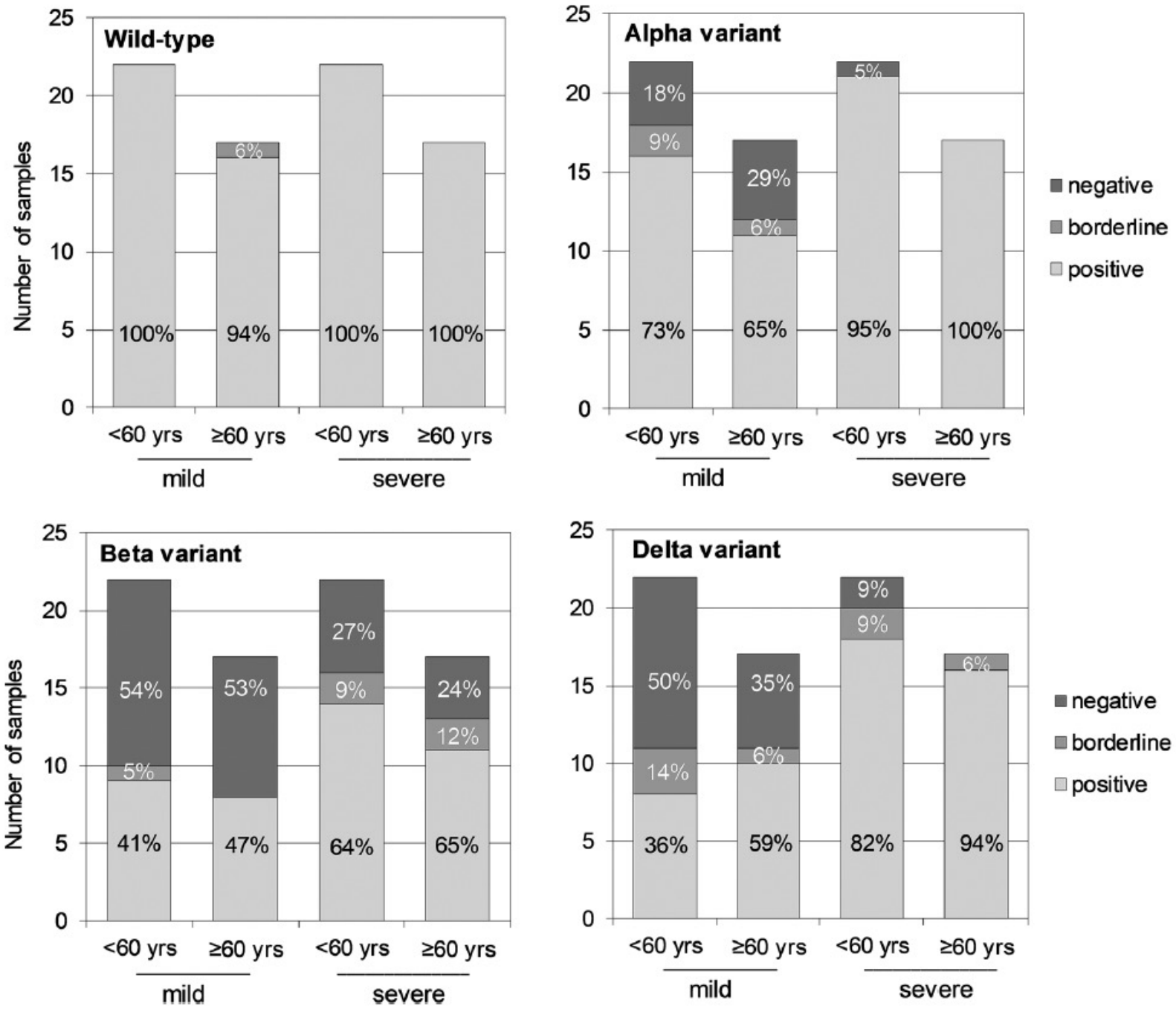


Spike - RBD





Severe Covid | Mild Covid | Severe Covid | Mild Covid | Severe Covid | Mild Covid


Wild-type
Alpha variant
Beta variant
Delta variant
Number of samples
0
5
10
15
20
25
<60 yrs
≥60 yrs
mild
severe
100%
94%
6%
73%
65%
29%
6%
18%
9%
95%
5%
41%
47%
64%
65%
54%
53%
27%
9%
24%
12%
5%
36%
59%
82%
94%
50%
35%
14%
6%
9%
9%
6%
negative
borderline
positive

BMJ Open

Longitudinal humoral antibody response to SARS-CoV-2 infection among healthcare workers in a New York City hospital

Vidya Menon ,[1] Masood A Shariff ,[1] Victor Perez Gutierrez,[1] Juan M Carreño,[2] Bo Yu,[1] Muzamil Jawed,[1] Marcia Gossai,[1] Elisenda Valdez,[1] Anjana Pillai,[1] Usha Venugopal,[1] Moiz Kasubhai,[1] Vihren Dimitrov,[1] Florian Krammer[2]

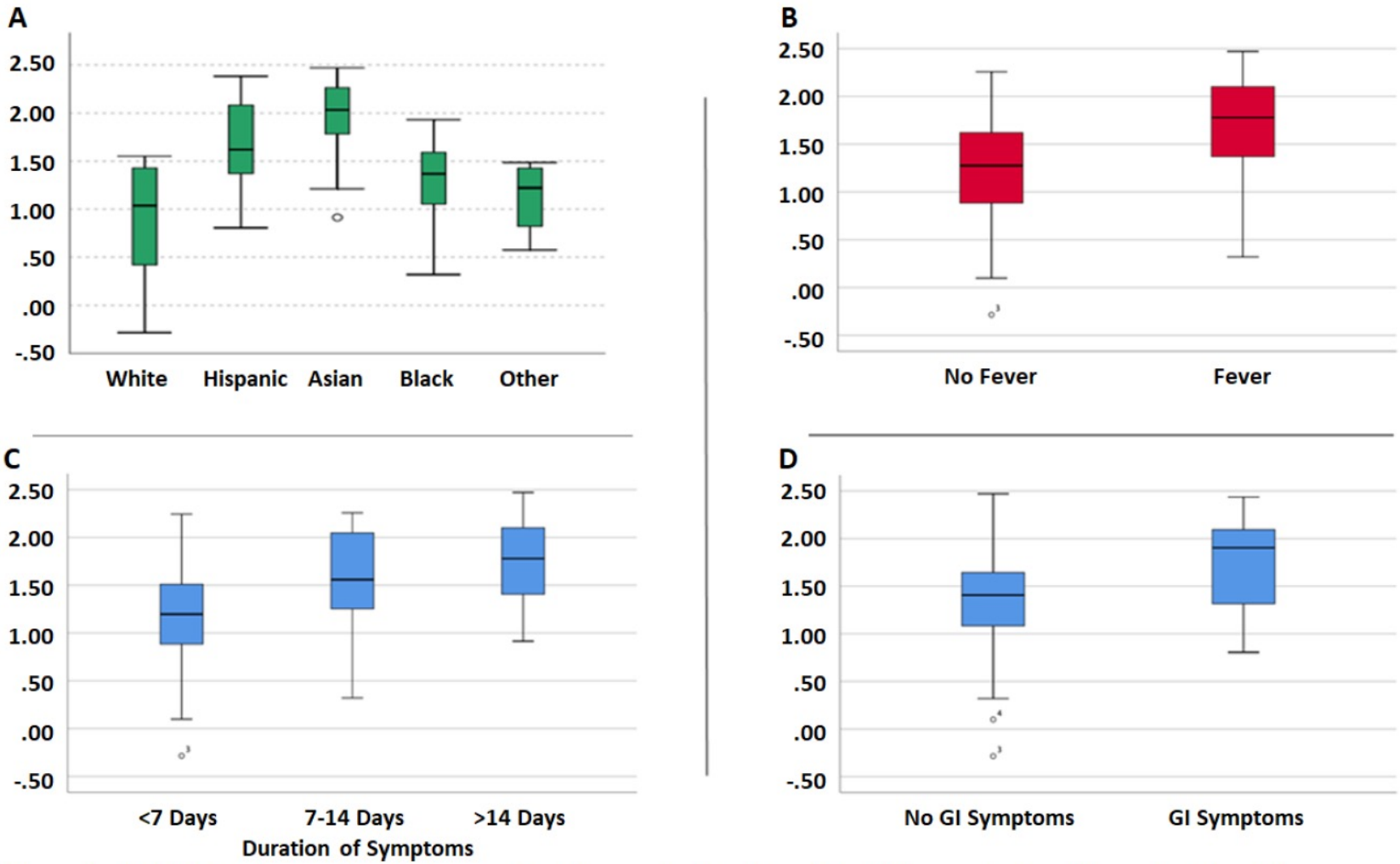


Figure 5 (A–D) Paired comparison between rate of decay of anti-spike antibody titres and patient characteristics. GI, gastrointestinal.

Received: 13 June 2021 | Revised: 6 August 2021 | Accepted: 10 August 2021
DOI: 10.1002/jmv.27270

RESEARCH ARTICLE

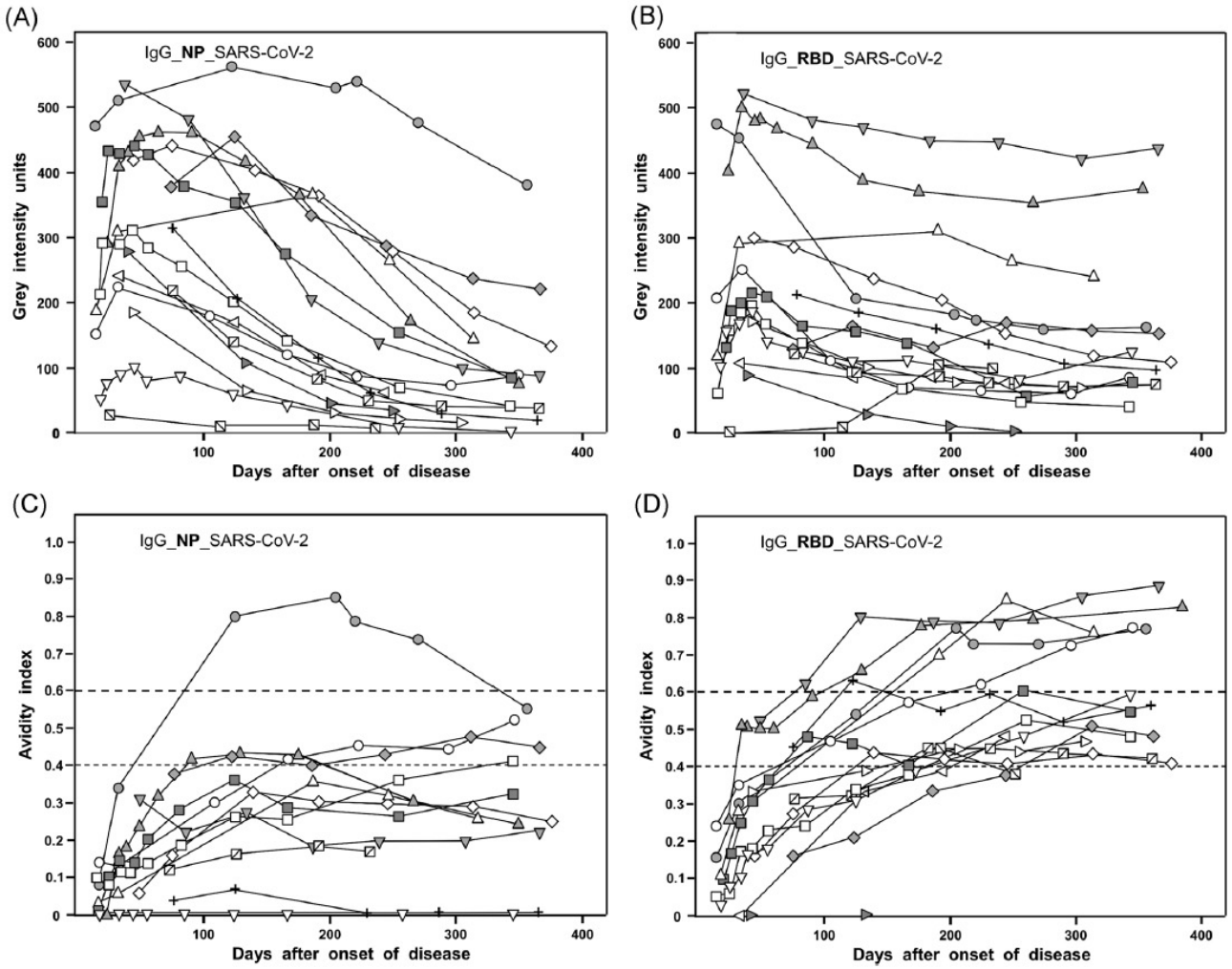
JOURNAL OF MEDICAL VIROLOGY WILEY

Vaccination versus infection with SARS-CoV-2: Establishment of a high avidity IgG response versus incomplete avidity maturation

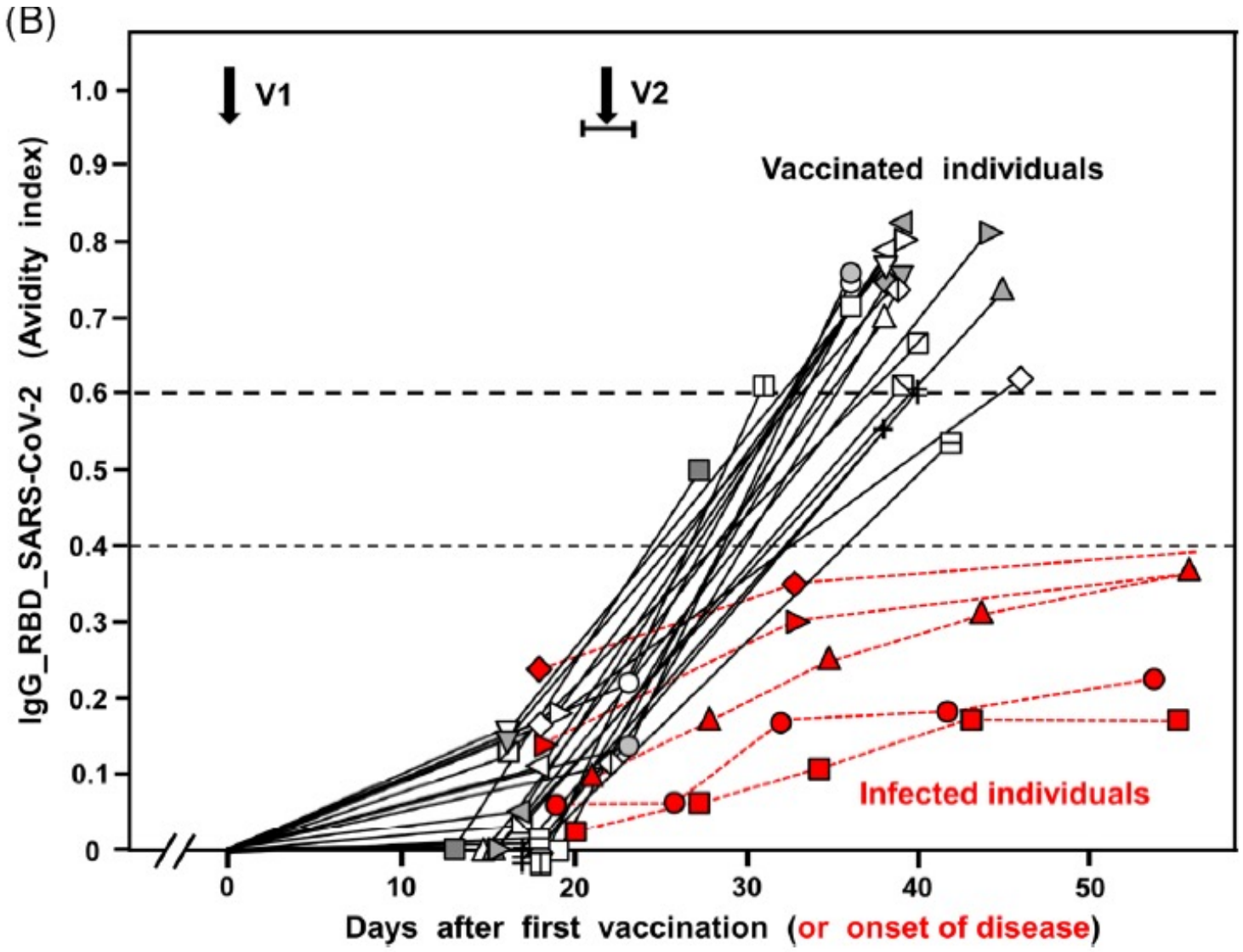
Friedhelm Struck[1] | Patrick Schreiner[1] | Eva Staschik[1] | Karin Wochinz-Richter[1] | Sarah Schulz[1] | Erwin Soutschek[1] | Manfred Motz[1] | Georg Bauer[2,3]

Concentration

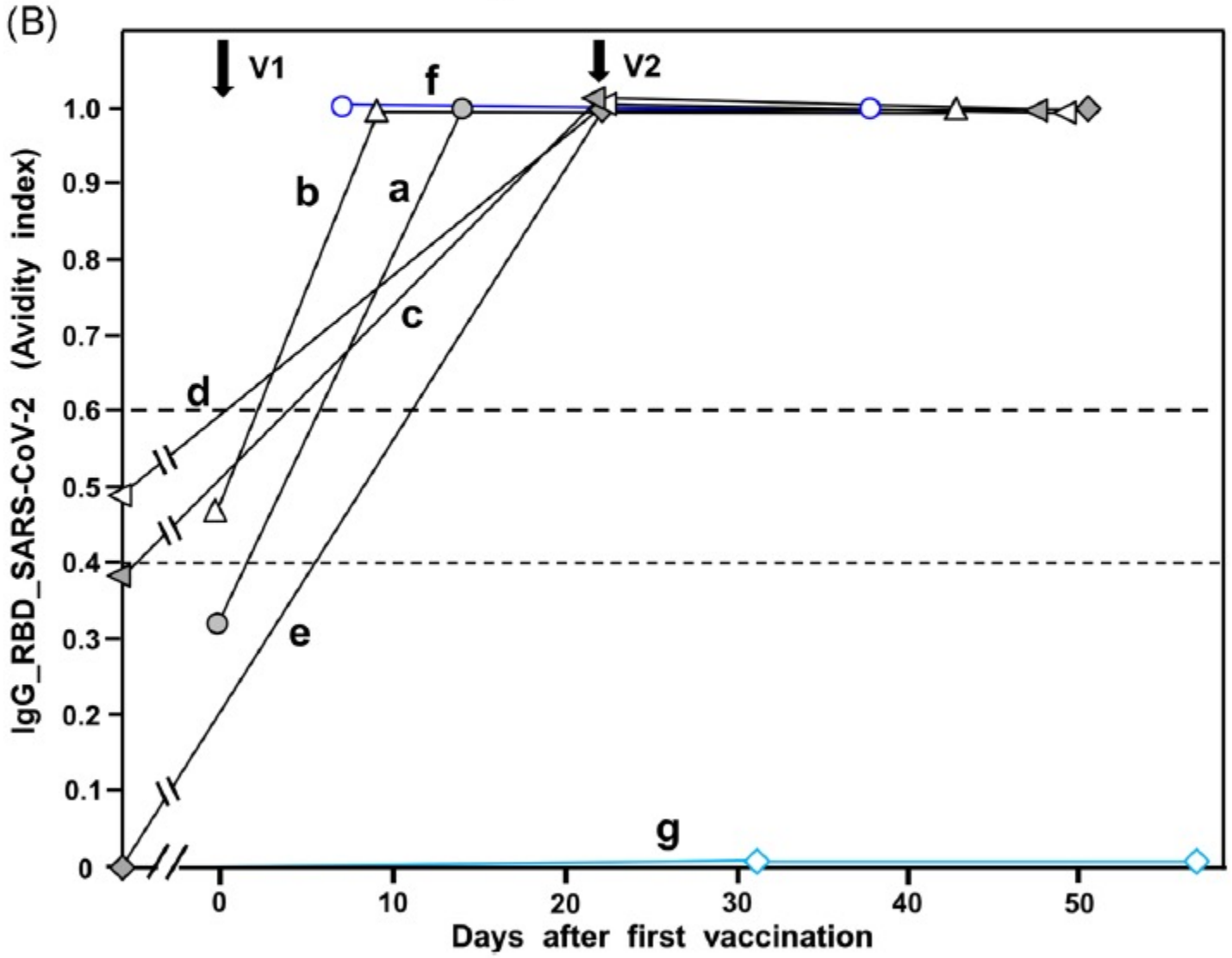
Affinité



Affinité des anticorps anti-Spike
infection
ou
vaccination



Affinité des anticorps anti-Spike
infection
puis vaccination



CMI

www.nature.com/cmi

REVIEW ARTICLE OPEN

Check for updates

SARS-CoV-2-specific T cells in infection and vaccination

Antonio Bertoletti[1,2]✉, Nina Le Bert[1], Martin Qui[1] and Anthony T. Tan[1]

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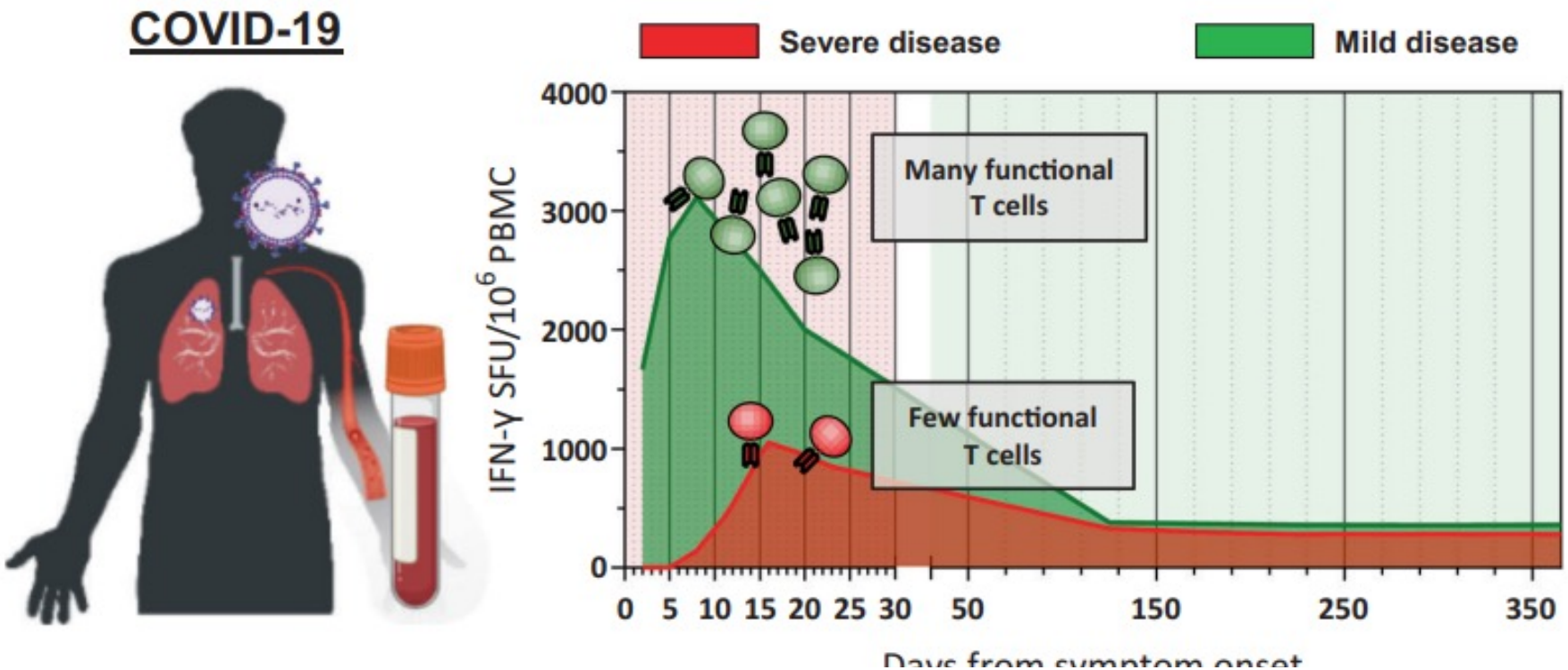


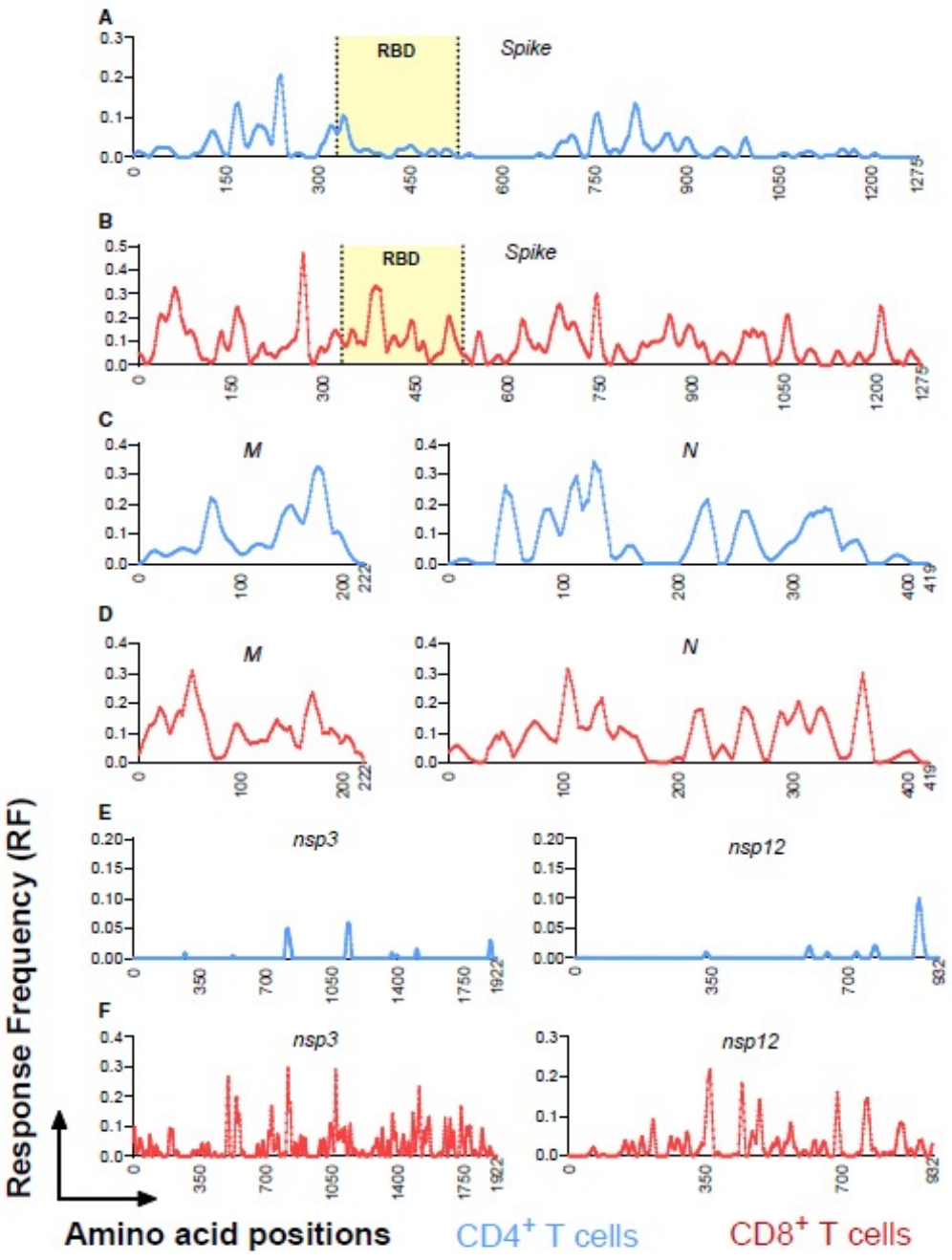
CellPress

Cell Host & Microbe

Review

SARS-CoV-2 human T cell epitopes: Adaptive immune response against COVID-19

Alba Grifoni,[1] John Sidney,[1] Randi Vita,[1] Bjoern Peters,[1,2] Shane Crotty,[1,2] Daniela Weiskopf,[1] and Alessandro Sette[1,2,*]
[1]Center for Infectious Disease and Vaccine Research, La Jolla Institute for Immunology (LJI), La Jolla, CA 92037, USA
[2]Department of Medicine, Division of Infectious Diseases and Global Public Health, University of California, San Diego (UCSD), La Jolla, CA 92037, USA
*Correspondence: alex@lji.org
https://doi.org/10.1016/j.chom.2021.05.010



Clinical Infectious Diseases
IDSA Infectious Diseases Society of America
hivma hiv medicine association

ACCEPTED MANUSCRIPT

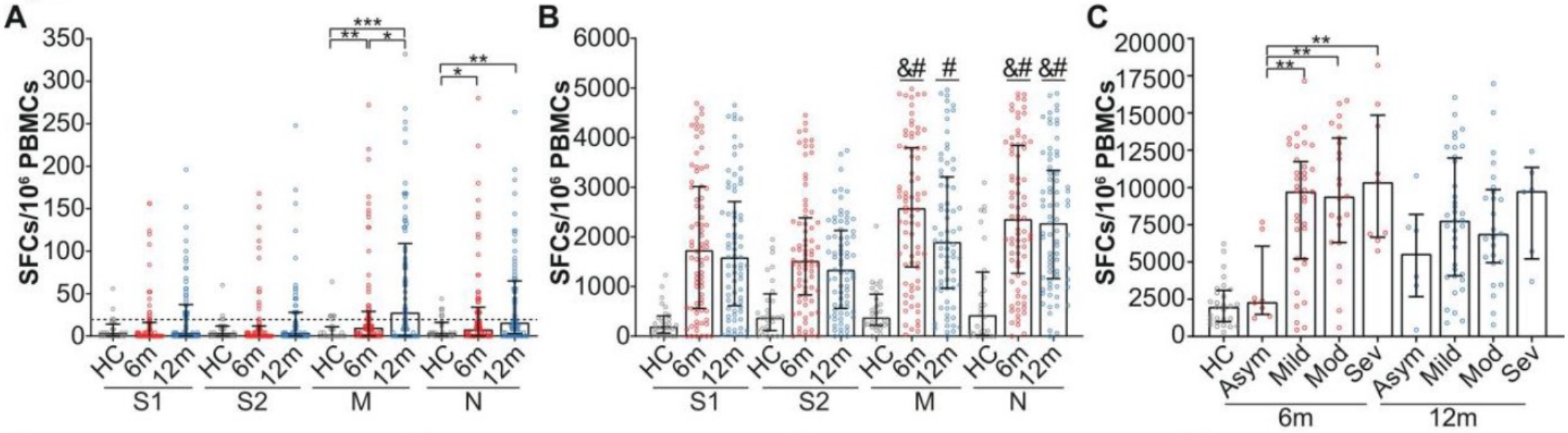
One-year sustained cellular and humoral immunities of COVID-19 convalescents FREE

Jie Zhang, Hao Lin, Beiwei Ye, Min Zhao, Jianbo Zhan, Shaobo Dong, Yaxin Guo, Yingze Zhao, Min Li, Sai Liu ... Show more
Author Notes

Freshly isolated PBMC

In vitro stimulated PBMC

Figure 3



Conclusions quant à l’immunité post-infectieuse

- Développement presque constant d’anticorps neutralisants
- Persistance d’un taux d’anticorps stable à 1 an chez la plupart des sujets
- Réponses humorales plus élevées en cas de tableaux graves
  - L’inverse pour les réponses cellulaires ?
- Forte réponse anticorps après vaccination des sujets antérieurement infectés
- Moindre efficacité sur le variant delta

Réponse vaccinale

Contents lists available at ScienceDirect

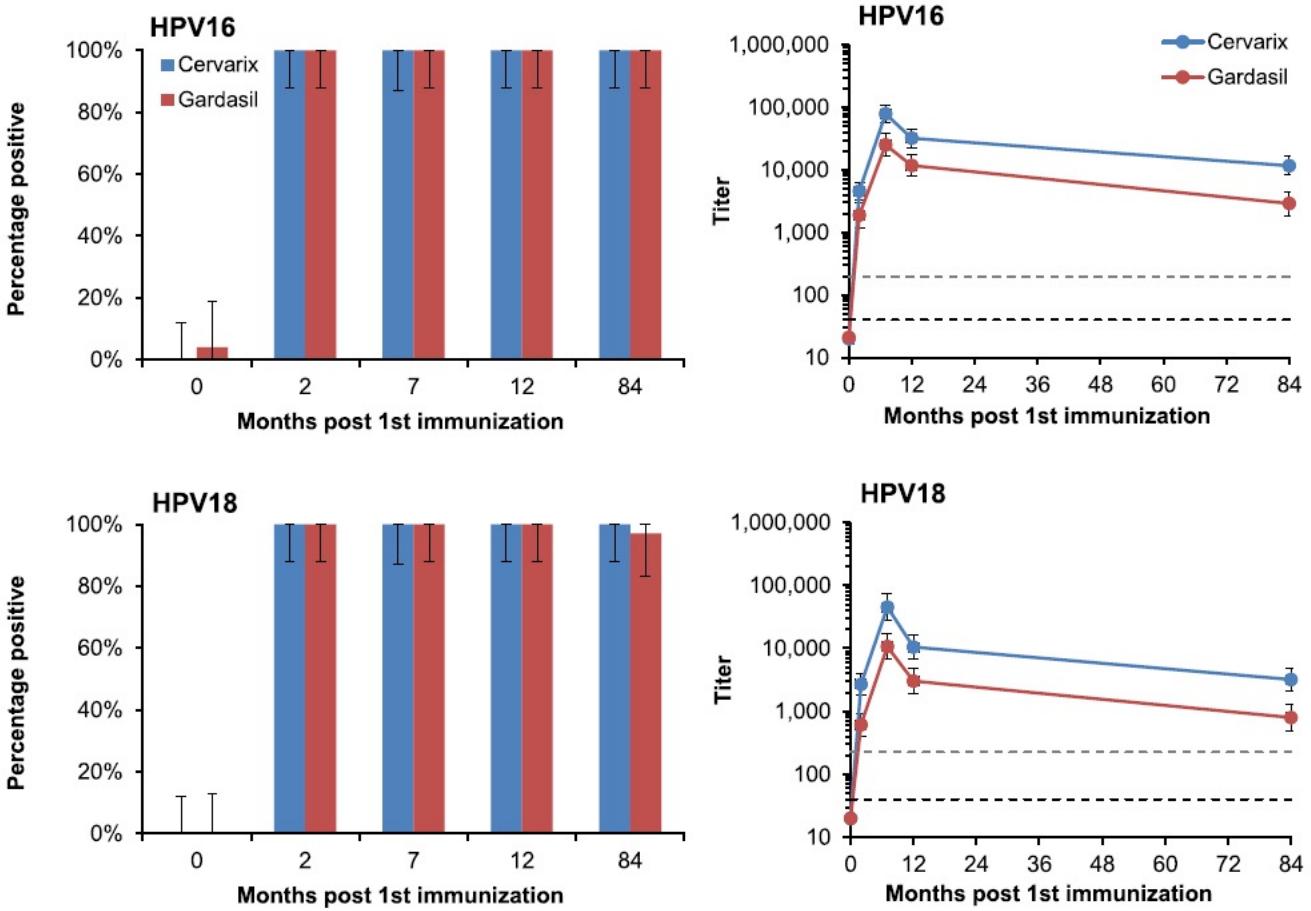
Vaccine

journal homepage: www.elsevier.com/locate/vaccine

2019

Durability of the neutralizing antibody response to vaccine and non-vaccine HPV types 7 years following immunization with either Cervarix® or Gardasil® vaccine

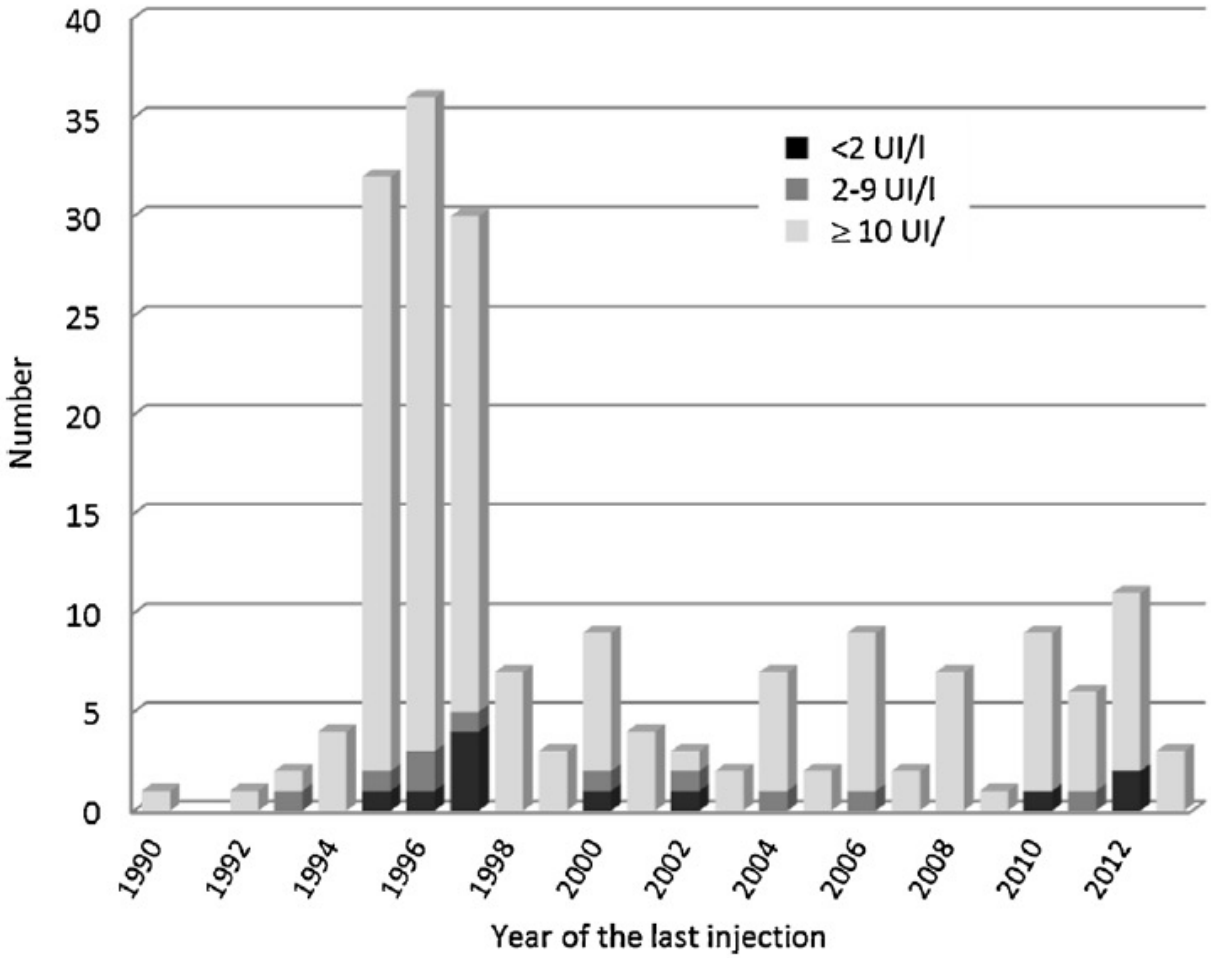
Anna Godi [a], Kavita Panwar [a], Mahmoud Haque [a], Clementina E. Cocuzza [c], Nick Andrews [d], Jo Southern [b], Paul Turner [e], Elizabeth Miller [b], Simon Beddows [a,*]

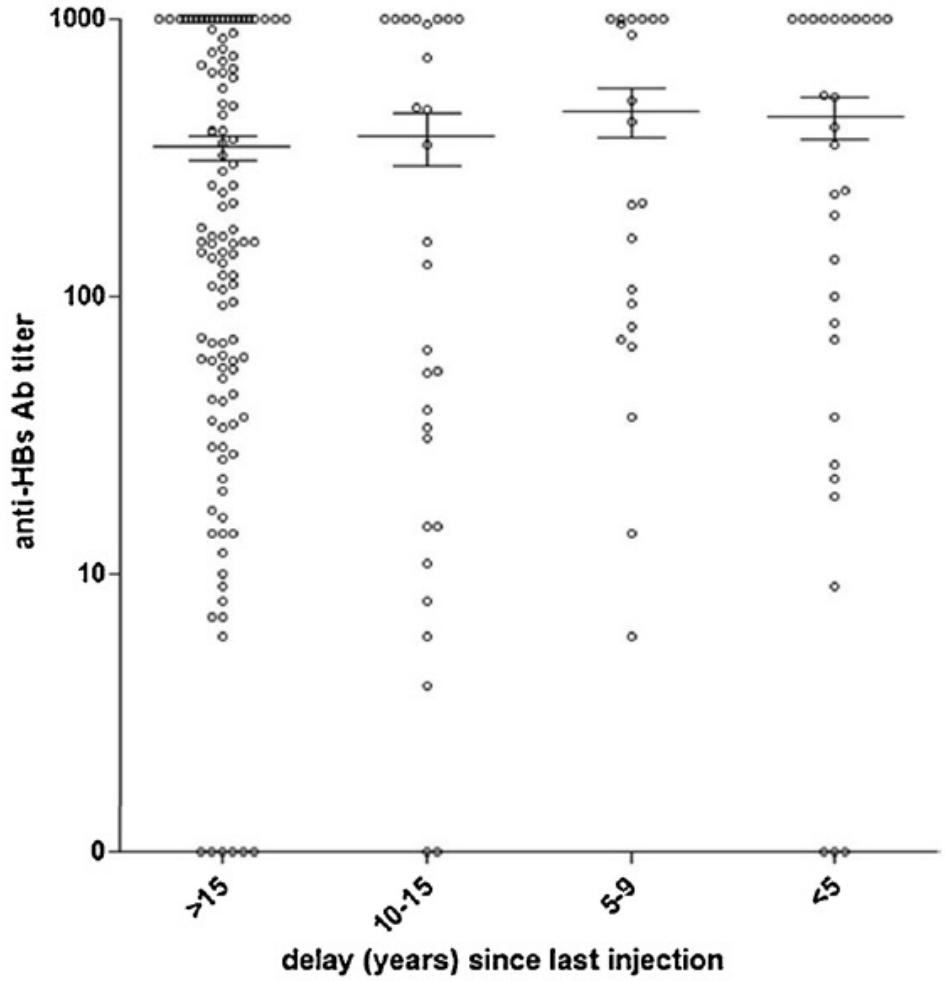


Hepatitis B vaccination status in an at-risk adult population: long-term immunity but insufficient coverage

2017

S. Hustache[1] · L. Moyroud[1,2] · L. Goirand[1] · O. Epaulard[2,3,4,5]





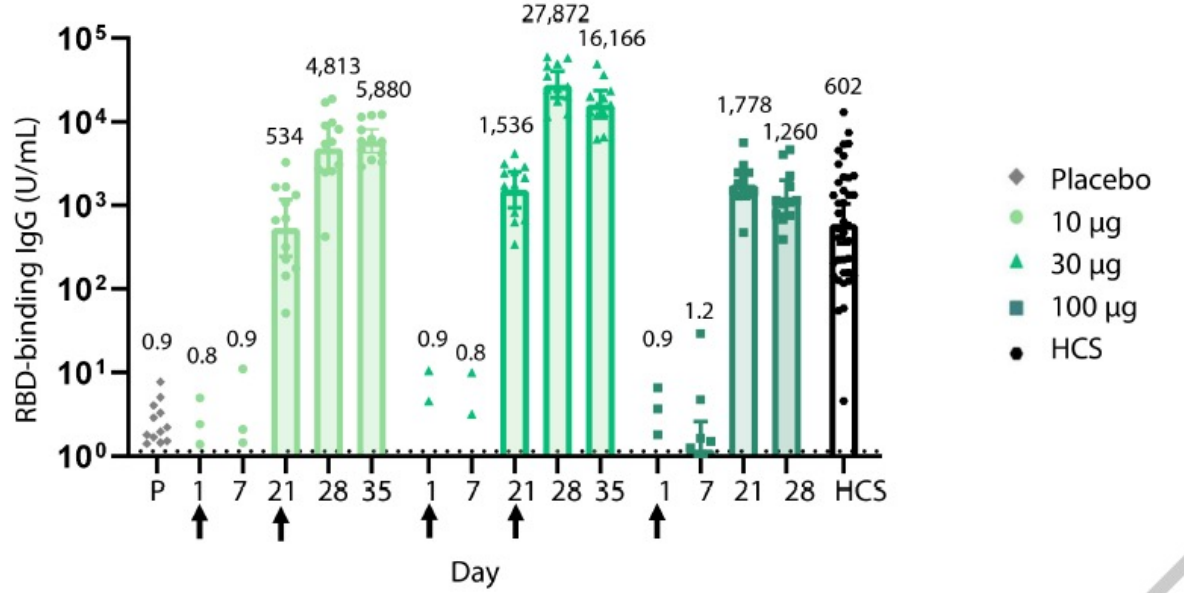
Article

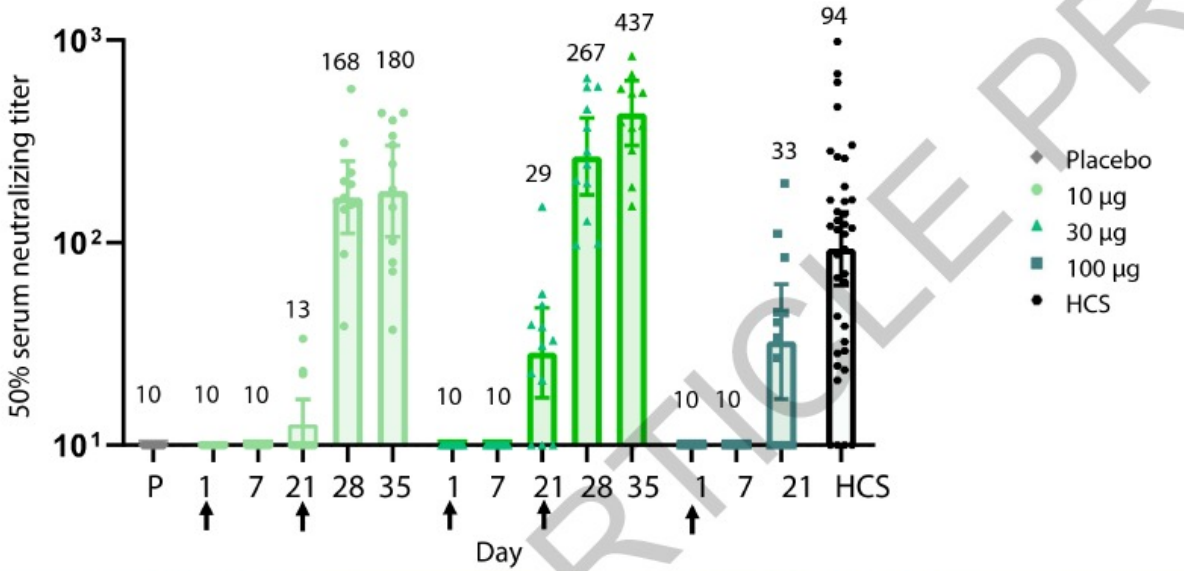
Phase I/II study of COVID-19 RNA vaccine BNT162b1 in adults

https://doi.org/10.1038/s41586-020-2639-4
Received: 29 June 2020
Accepted: 4 August 2020
Published online: 12 August 2020
Check for updates

Mark J. Mulligan[1,2,12], Kirsten E. Lyke[3,12], Nicholas Kitchin[4,12], Judith Absalon[5]✉, Alejandra Gurtman[5], Stephen Lockhart[4], Kathleen Neuzil[3], Vanessa Raabe[1,2], Ruth Bailey[4], Kena A. Swanson[5], Ping Li[6], Kenneth Koury[5], Warren Kalina[5], David Cooper[5], Camila Fontes-Garfias[7], Pei-Yong Shi[7], Özlem Türeci[8], Kristin R. Tompkins[5], Edward E. Walsh[9,10], Robert Frenck[11], Ann R. Falsey[9,10], Philip R. Dormitzer[5], William C. Gruber[5], Uğur Şahin[8] & Kathrin U. Jansen[5]

June 2020





HCS : *Human COVID-19 convalescent sera*

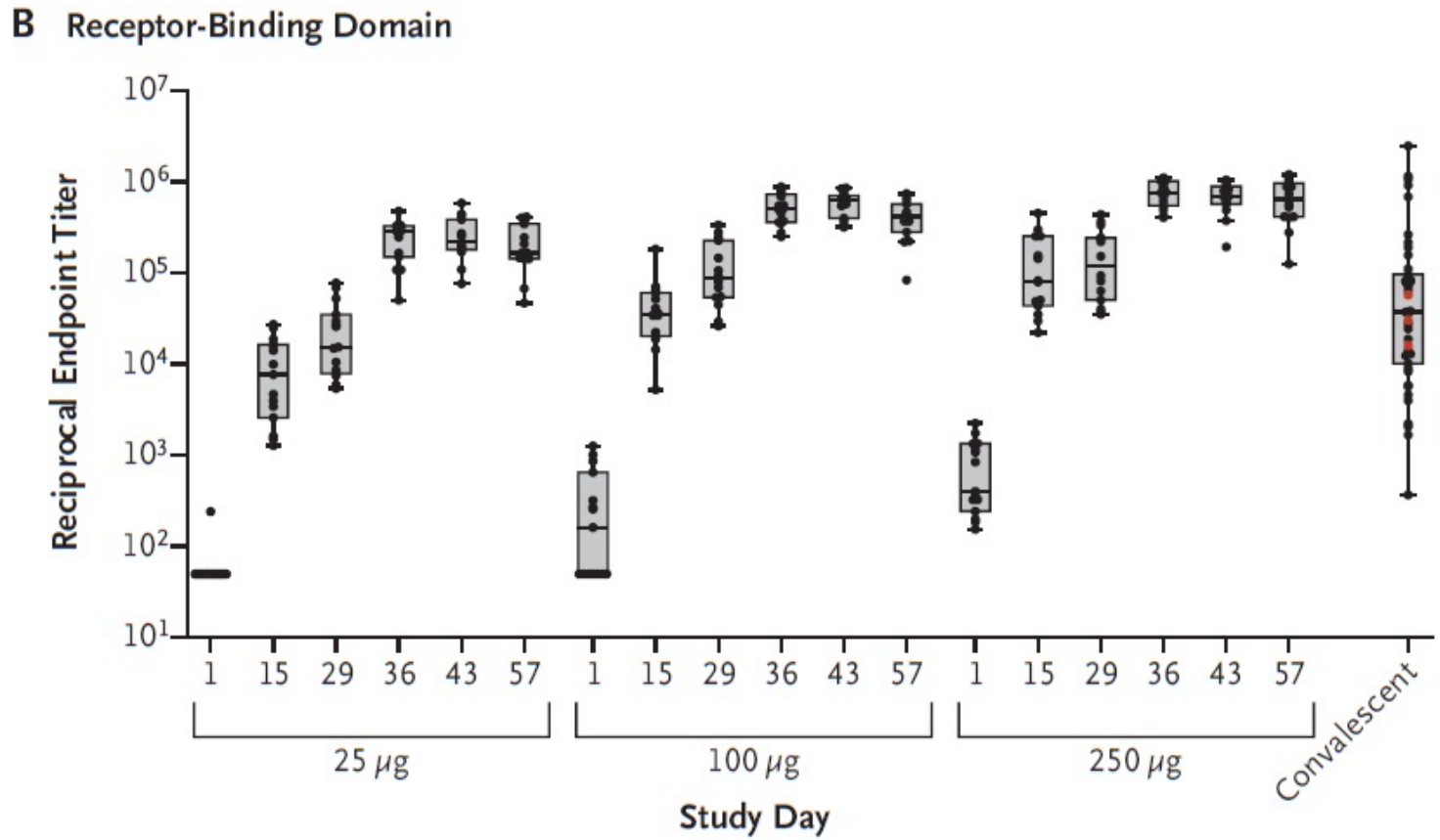
The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

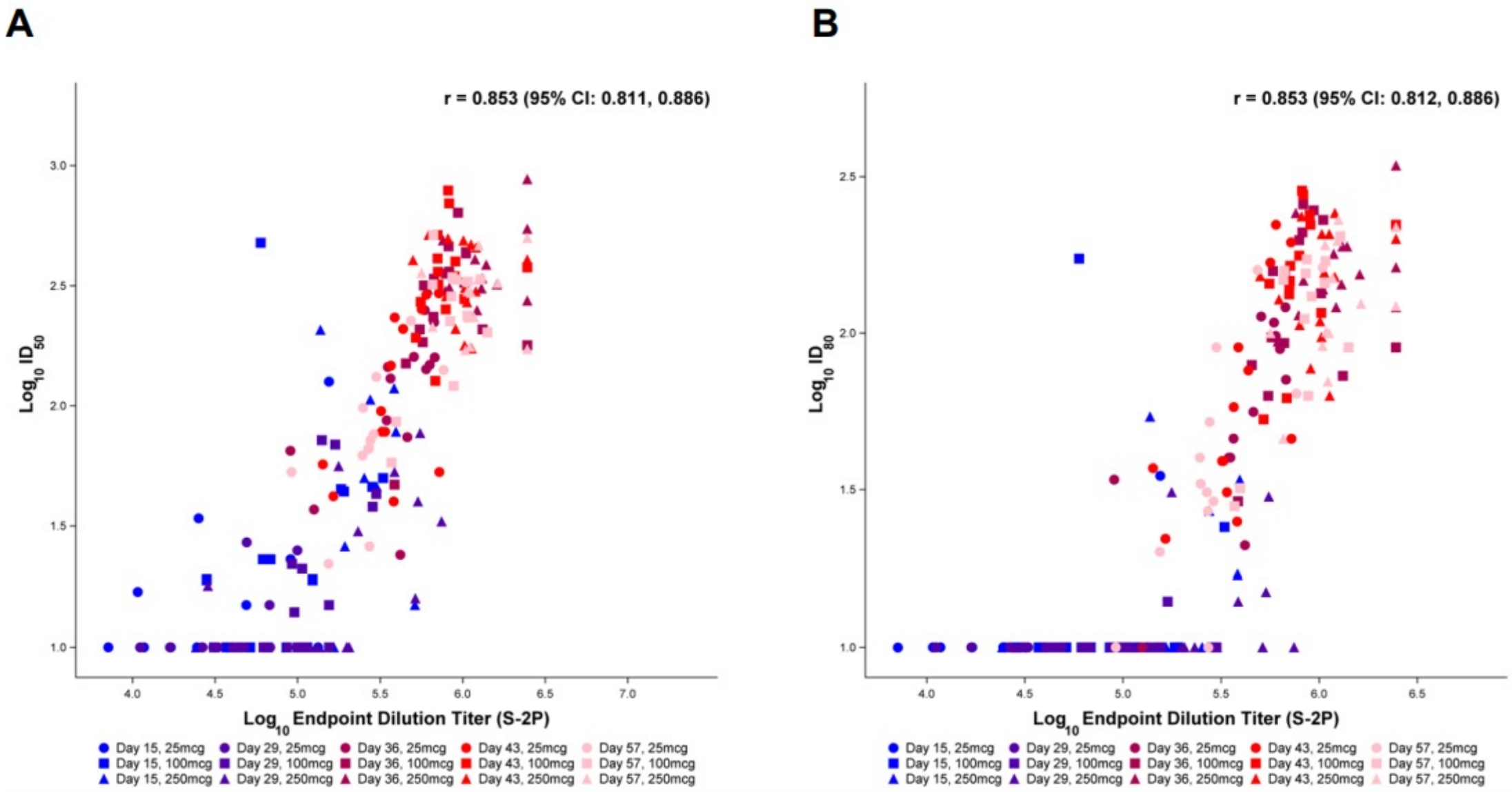
An mRNA Vaccine against SARS-CoV-2 — Preliminary Report

L.A. Jackson, E.J. Anderson, N.G. Rouphael, P.C. Roberts, M. Makhene, R.N. Coler, M.P. McCullough, J.D. Chappell, M.R. Denison, L.J. Stevens, A.J. Pruijssers, A. McDermott, B. Flach, N.A. Doria-Rose, K.S. Corbett, K.M. Morabito, S. O'Dell, S.D. Schmidt, P.A. Swanson II, M. Padilla, J.R. Mascola, K.M. Neuzil, H. Bennett, W. Sun, E. Peters, M. Makowski, J. Albert, K. Cross, W. Buchanan, R. Pikaart-Tautges, J.E. Ledgerwood, B.S. Graham, and J.H. Beigel, for the mRNA-1273 Study Group*

July 2020

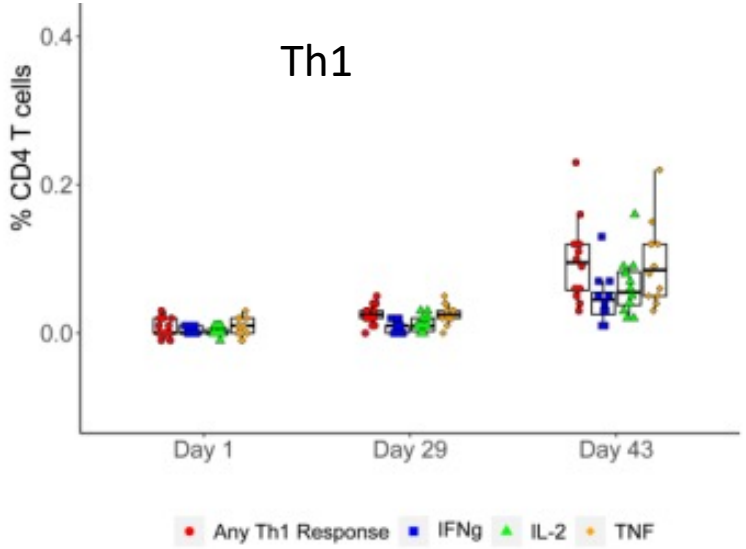


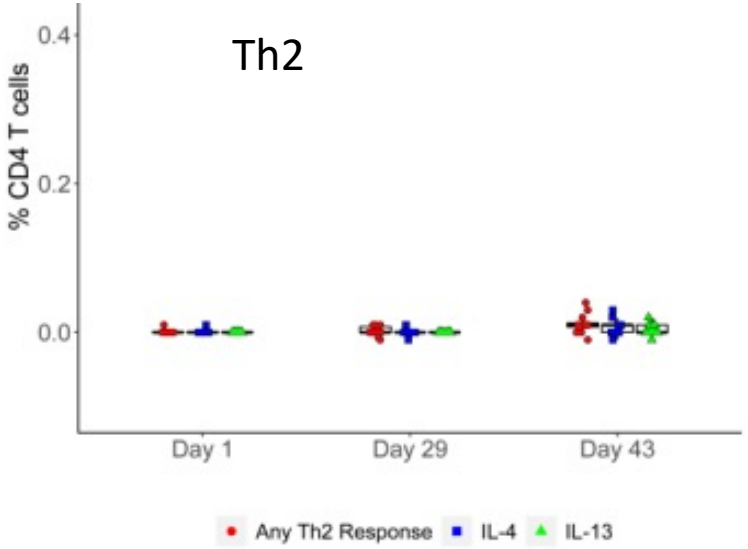
Pseudovirus neutralization



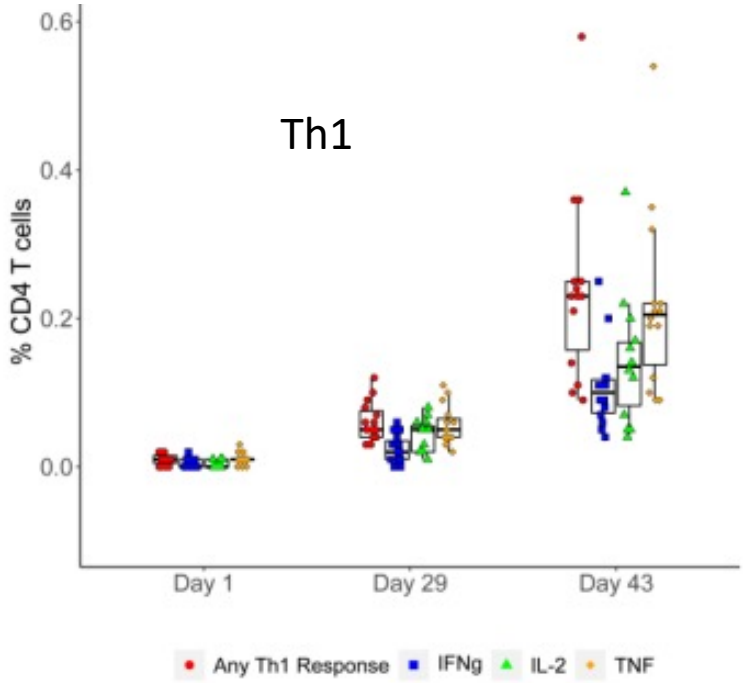
Binding in IgG ELISA

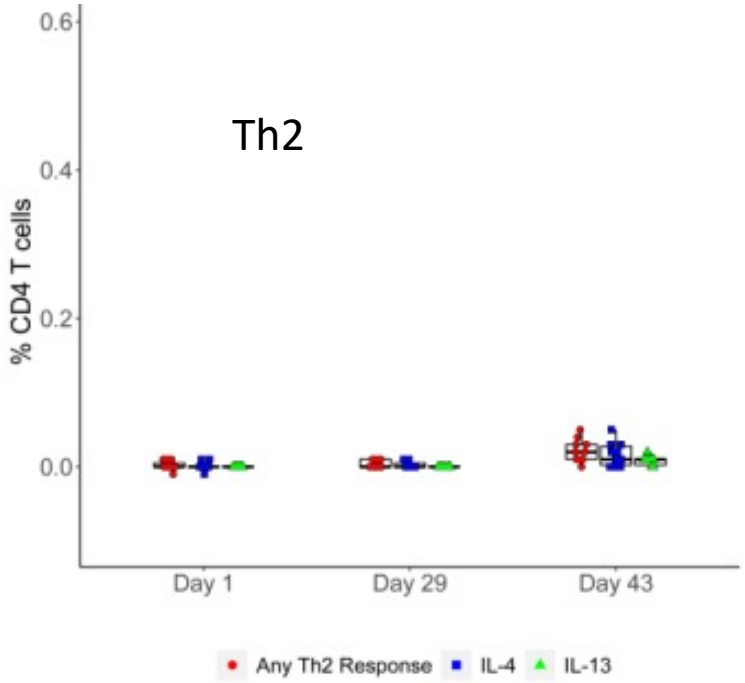
25µg





100µg





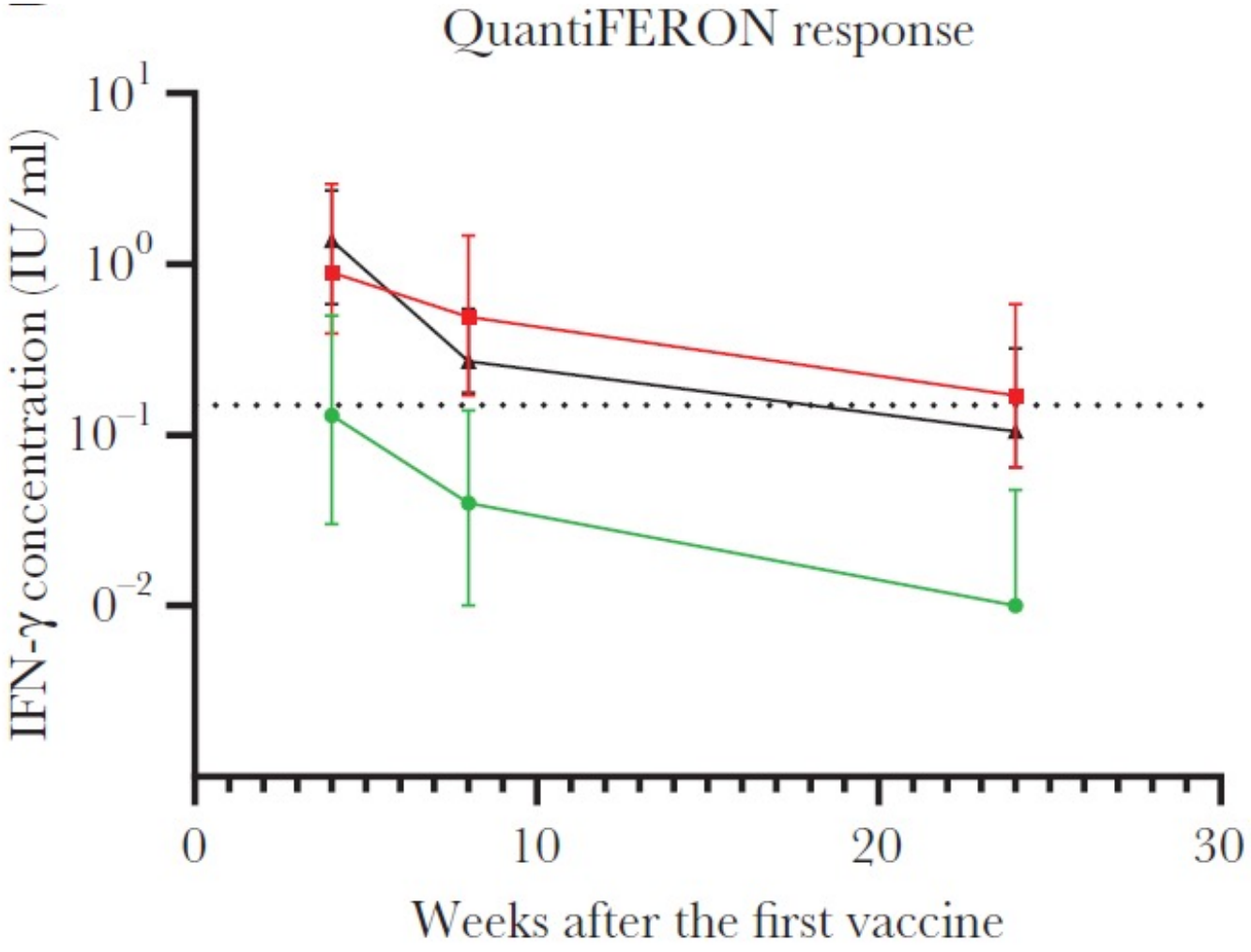
Frequencies of CD4 T cells producing the indicated cytokines from 25µg or 100µg dose groups

The Journal of Infectious Diseases

BRIEF REPORT

Dynamics of the Cellular and Humoral Immune Response After BNT162b2 Messenger Ribonucleic Acid Coronavirus Disease 2019 (COVID-19) Vaccination in COVID-19-Naive Nursing Home Residents

Jens T. Van Praet,[1,2] Stefaan Vandecasteele,[1] Anneleen De Roo,[3] Matthijs Vynck,[4] An S. De Vriese,[1,2] and Marijke Reynders[5]



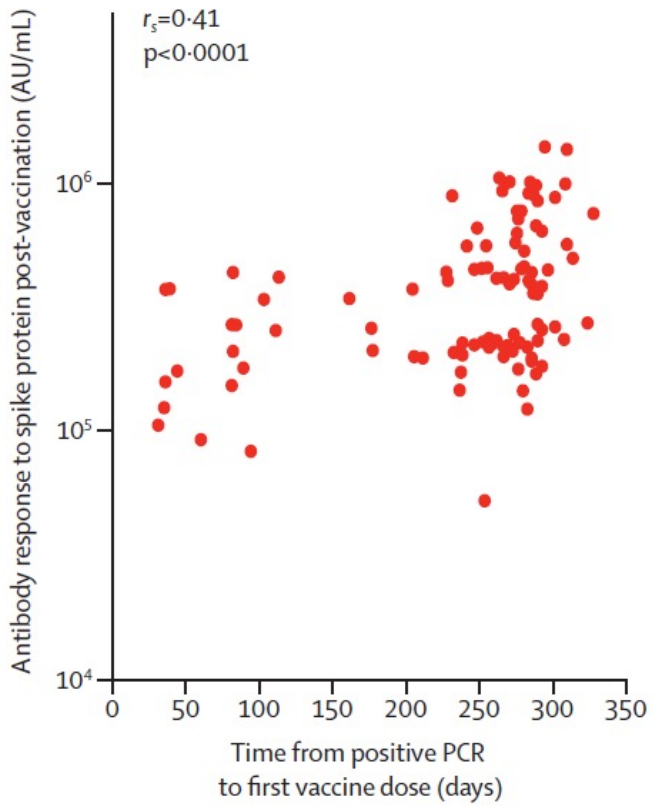
Covid-19-naive residents

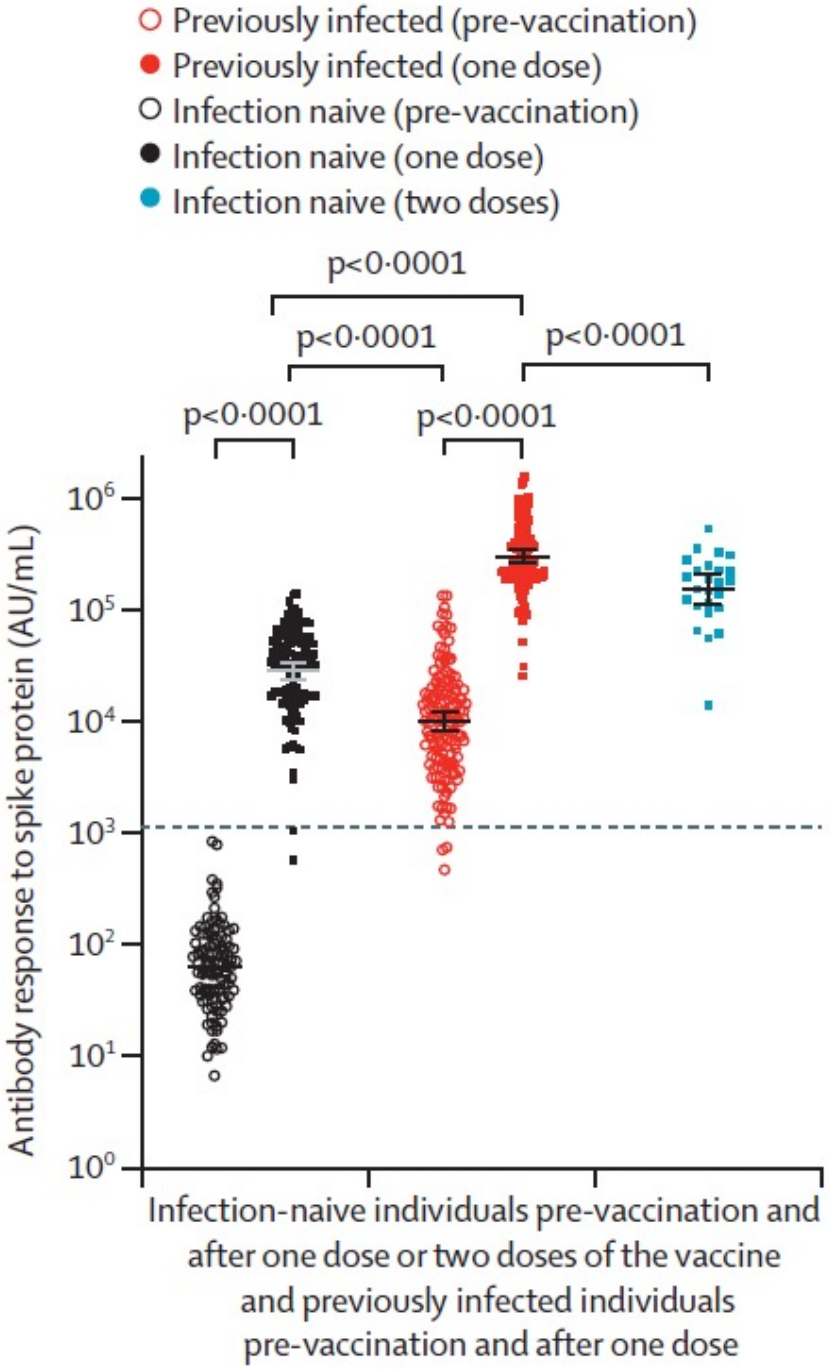
Covid-19-experienced residents

Covid-19-naive healthcare workers

T-cell and antibody responses to first BNT162b2 vaccine dose in previously infected and SARS-CoV-2-naive UK health-care workers: a multicentre prospective cohort study

Adrienn Angyal, Stephanie Longet*, Shona C Moore*, Rebecca P Payne*, Adam Harding*, Tom Tipton, Patpong Rongkard, Mohammad Ali, Luisa M Hering, Naomi Meardon, James Austin, Rebecca Brown, Donal Skelly, Natalie Gillson, Sue L Dobson, Andrew Cross, Gurjinder Sandhar, Jonathan A Kilby, Jessica K Tyerman, Alexander R Nicols, Jarmila S Spegarova, Hema Mehta, Hailey Hornsby, Rachel Whitham, Christopher P Conlon, Katie Jeffery, Philip Goulder, John Frater, Christina Dold, Matthew Pace, Ane Ogbe, Helen Brown, M Azim Ansari, Emily Adland, Anthony Brown, Meera Chand, Adrian Shields, Philippa C Matthews, Susan Hopkins, Victoria Hall, William James, Sarah L Rowland-Jones, Paul Klenerman, Susanna Dunachie, Alex Richter†, Christopher J A Duncan†, Eleanor Barnes†, Miles Carroll†, Lance Turtle†, Thushan I de Silva†, on behalf of the PITCH Consortium‡*





Taylor & Francis
Taylor & Francis Group

INFECTIOUS DISEASES,
2021; VOL. 0,
NO. 0, 1–9

https://doi.org/10.1080/23744235.2021.1974540

ORIGINAL ARTICLE

Seroprevalence and levels of IgG antibodies after COVID-19 infection or vaccination

Hiie Soeorg[a], Piia Jõgi[b,c], Paul Naaber[a,d], Aigar Ottas[e], Karolin Toompere[f] and Irja Lutsar[a]

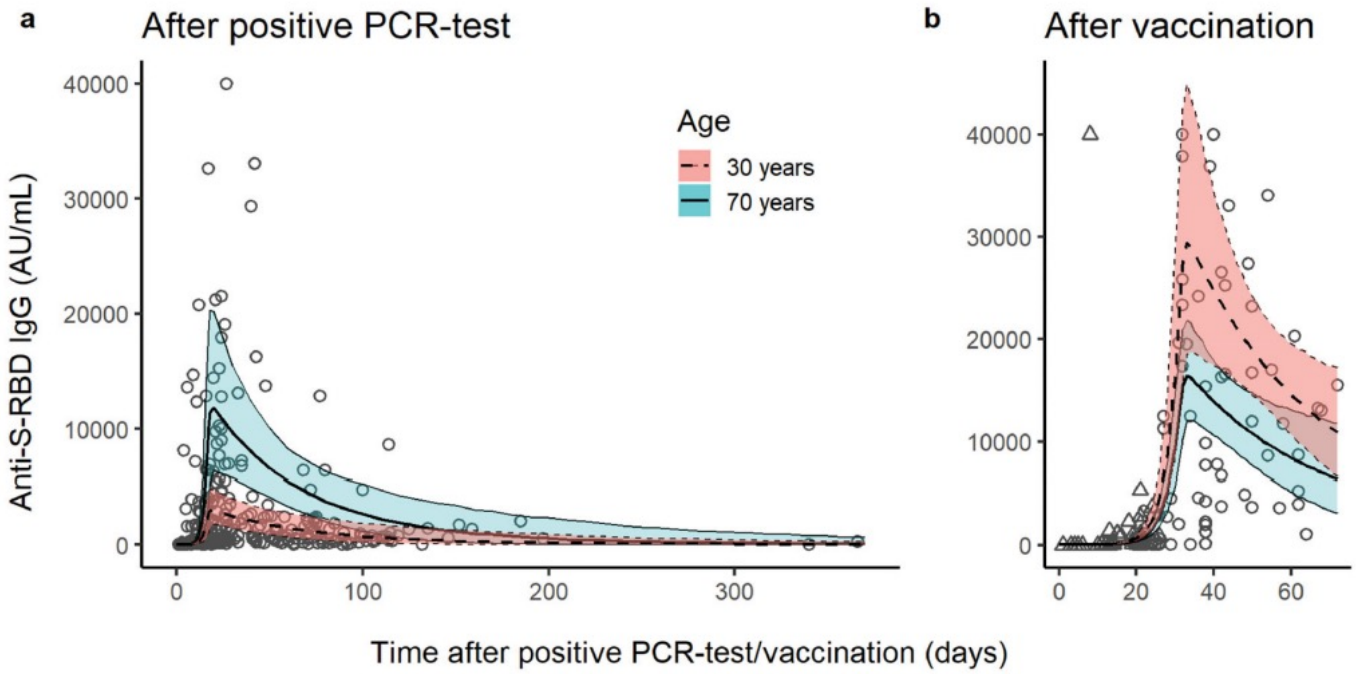
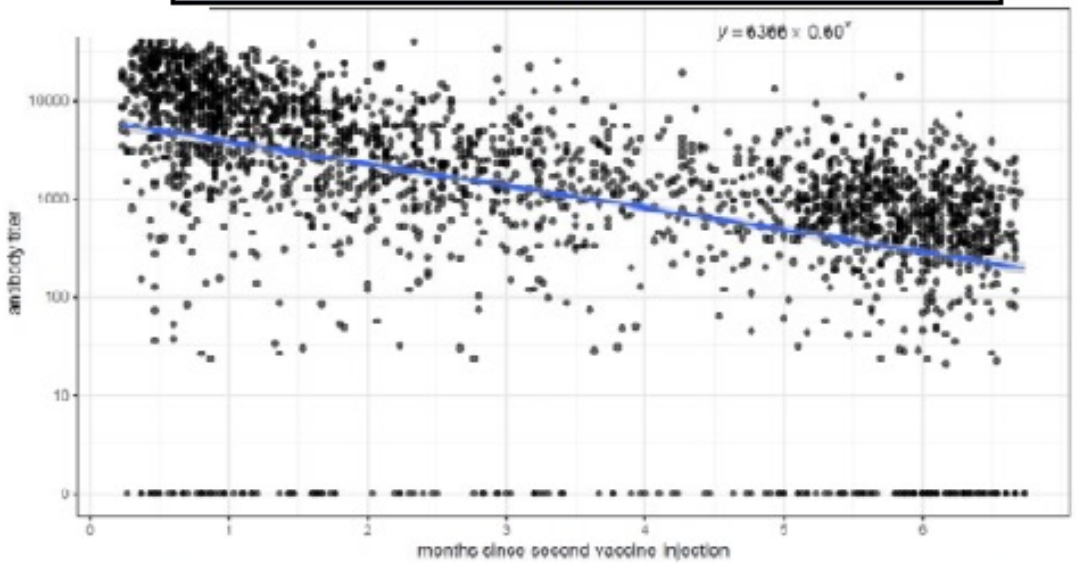


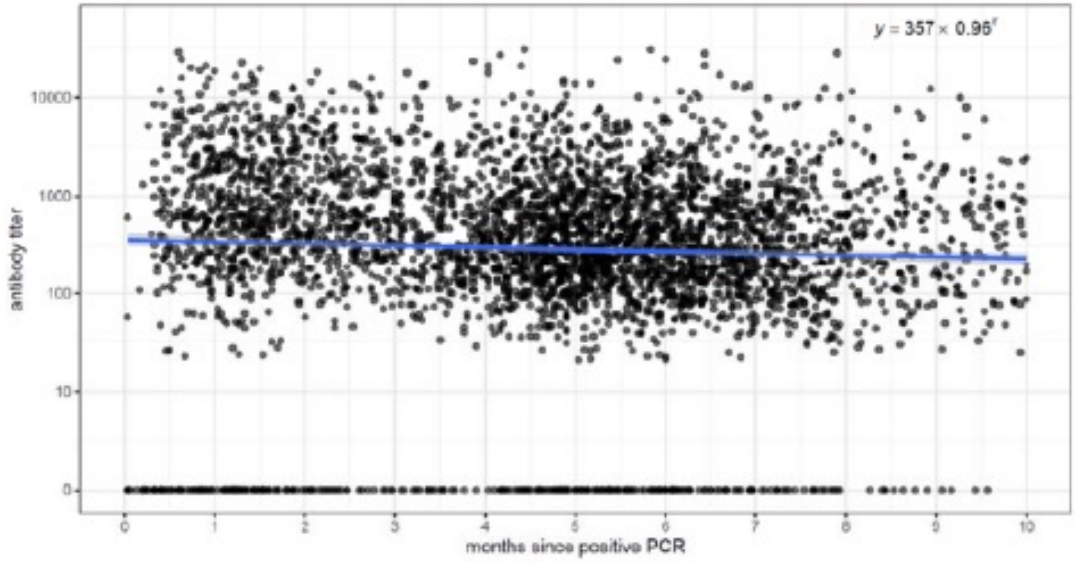
Figure 4. Mean IgG level against receptor binding domain of spike protein (anti-S-RBD IgG) and 95% confidence interval in a 30-year-old individual (dashed lines and red shaded area) or a 70-year-old individual (solid lines and green shaded area) after a) positive PCR-test or b) vaccination with the first dose. Dots show observed antibody levels in those with positive PCR-test or vaccinated with two doses, triangles in those vaccinated with one dose.

Israel A et al , *medRxiv*, **2021**,
doi : 10.1101/2021.08.19.21262111;

VACCINATIONS



INFECTIONS



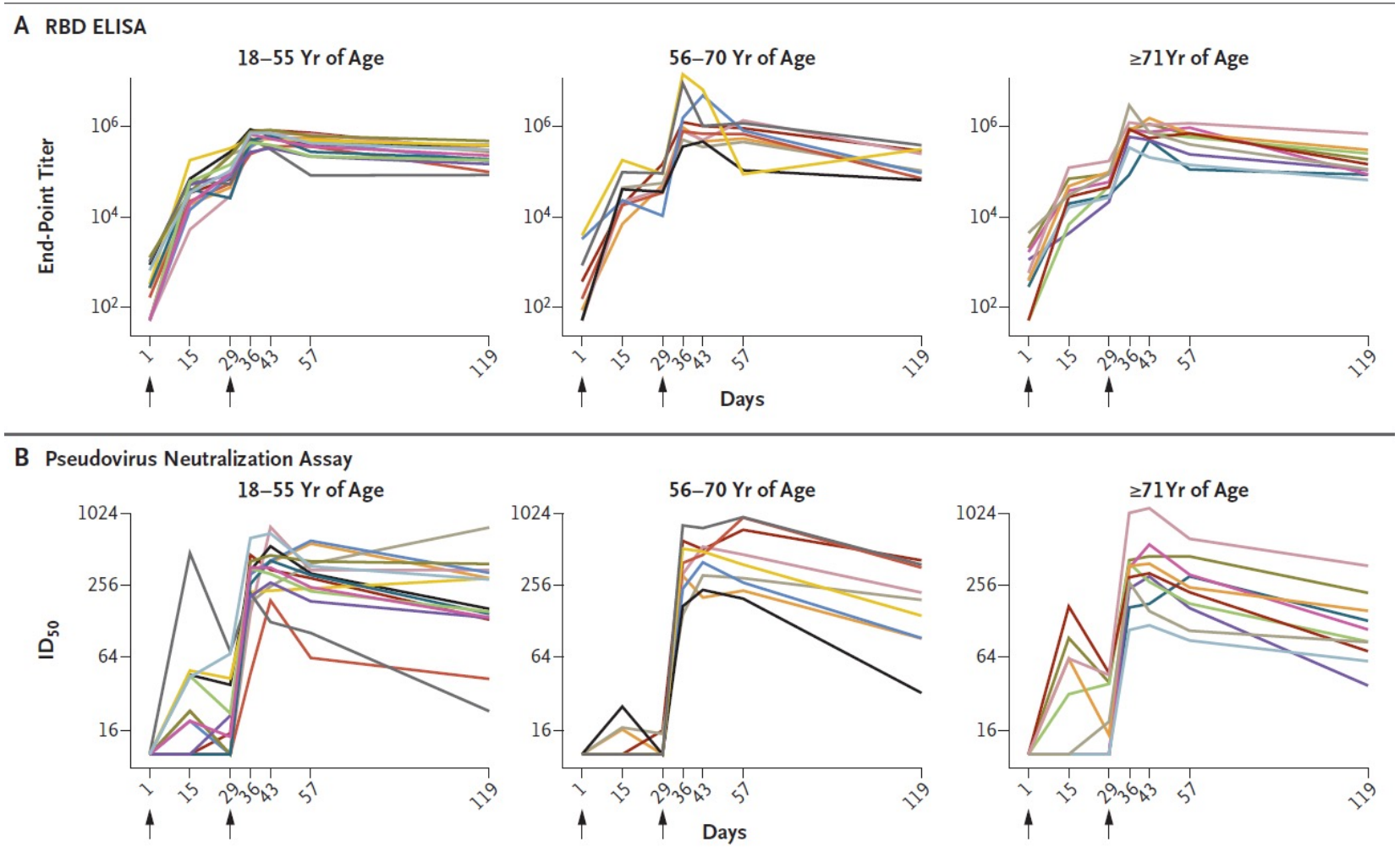
Merci J.-D. Lelièvre

The NEW ENGLAND JOURNAL of MEDICINE

Dec 2020

CORRESPONDENCE

Durability of Responses after SARS-CoV-2 mRNA-1273 Vaccination



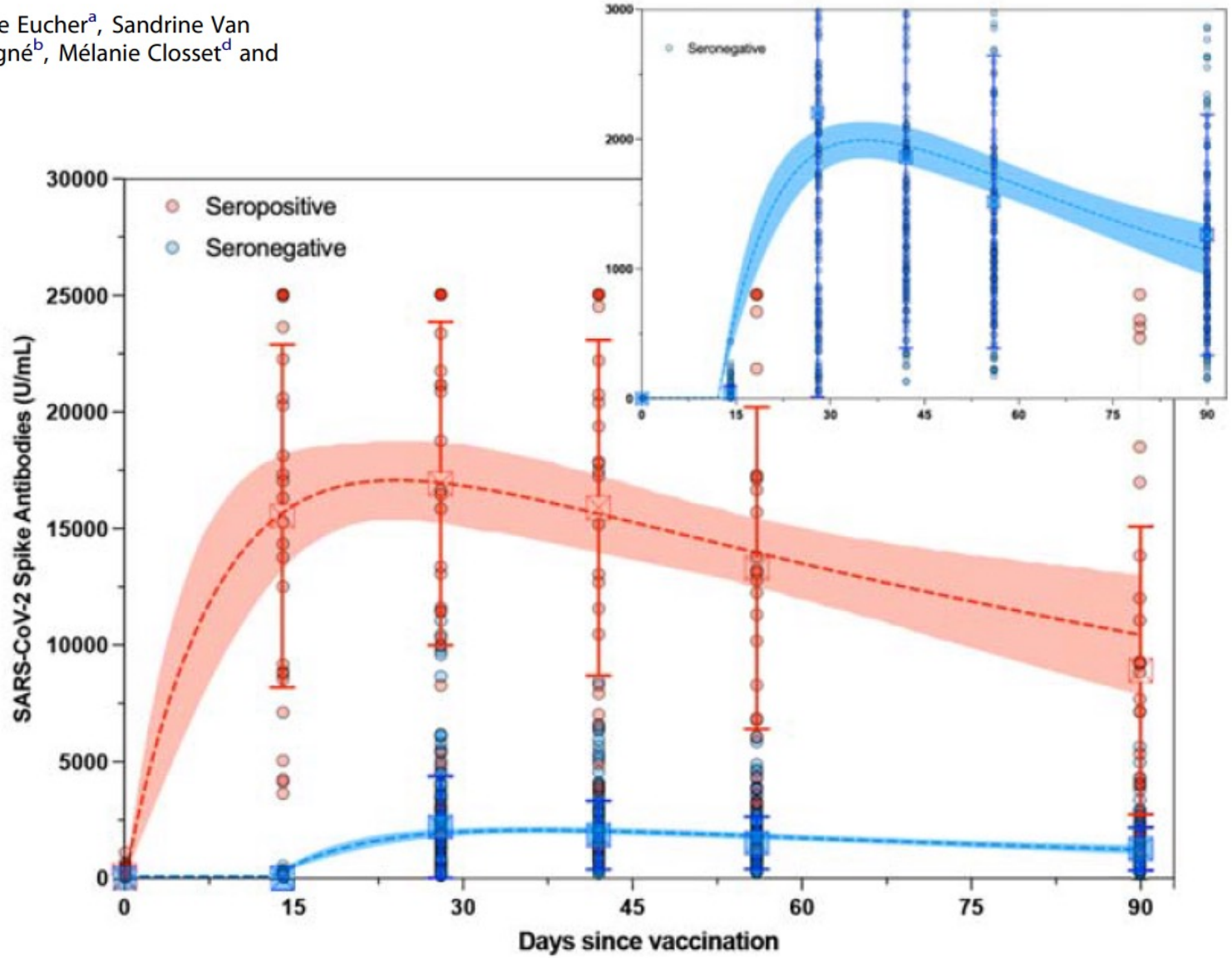
Emerging Microbes & Infections
2021, VOL. 10
https://doi.org/10.1080/22221751.2021.1953403

ORIGINAL ARTICLE

OPEN ACCESS Check for updates

Antibody titres decline 3-month post-vaccination with BNT162b2

Julien Favresse[a,b], Jean-Louis Bayart[c], François Mullier[d], Marc Elsen[a], Christine Eucher[a], Sandrine Van Eeckhoudt[e], Tatiana Roy[c], Gregoire Wieers[f], Christine Laurent[g], Jean-Michel Dogné[b], Mélanie Closset[d] and Jonathan Douxfils[b,h]



The Lancet Regional Health - Europe 10 (2021) 100208

Contents lists available at ScienceDirect

The Lancet Regional Health - Europe

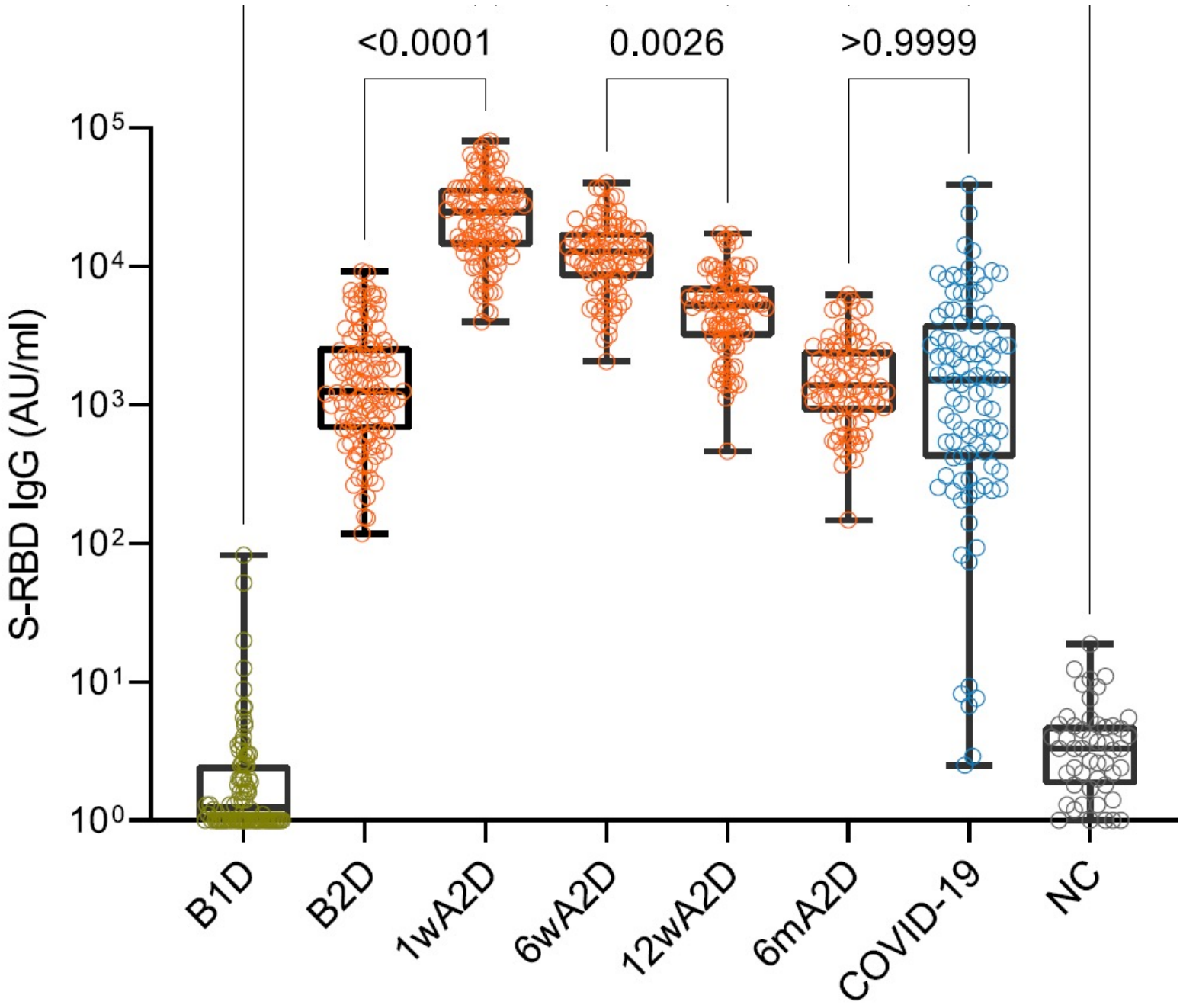
journal homepage: www.elsevier.com/lanepe

Research paper

Dynamics of antibody response to BNT162b2 vaccine after six months: a longitudinal prospective study

Paul Naaber[a,b,*], Liina Tserel[c], Kadri Kangro[d], Epp Sepp[b], Virge Jürjenson[a], Ainika Adamson[a], Liis Haljasmägi[c], Anna Pauliina Rumm[c], Regina Maruste[c], Jaanika Kärner[c], Joachim M. Gerhold[d], Anu Planken[d,e], Mart Ustav[d], Kai Kisand[c], Pärt Peterson[c]

[a] *SYNLAB Estonia, Tallinn, Estonia*
[b] *Department of Microbiology, Institute of Biomedicine and Translational Medicine, University of Tartu, Tartu, Estonia*
[c] *Molecular Pathology, Institute of Biomedicine and Translational Medicine, University of Tartu, Tartu, Estonia*
[d] *Icosagen Cell Factory, Õssu, Kambja, Estonia*
[e] *Department of Oncology, North-Estonian Medical Centre, Tallinn, Estonia.*


<0.0001
0.0026
>0.9999
S-RBD IgG (AU/ml)
10^5
10^4
10^3
10^2
10^1
10^0
B1D
B2D
1wA2D
6wA2D
12wA2D
6mA2D
COVID-19
NC

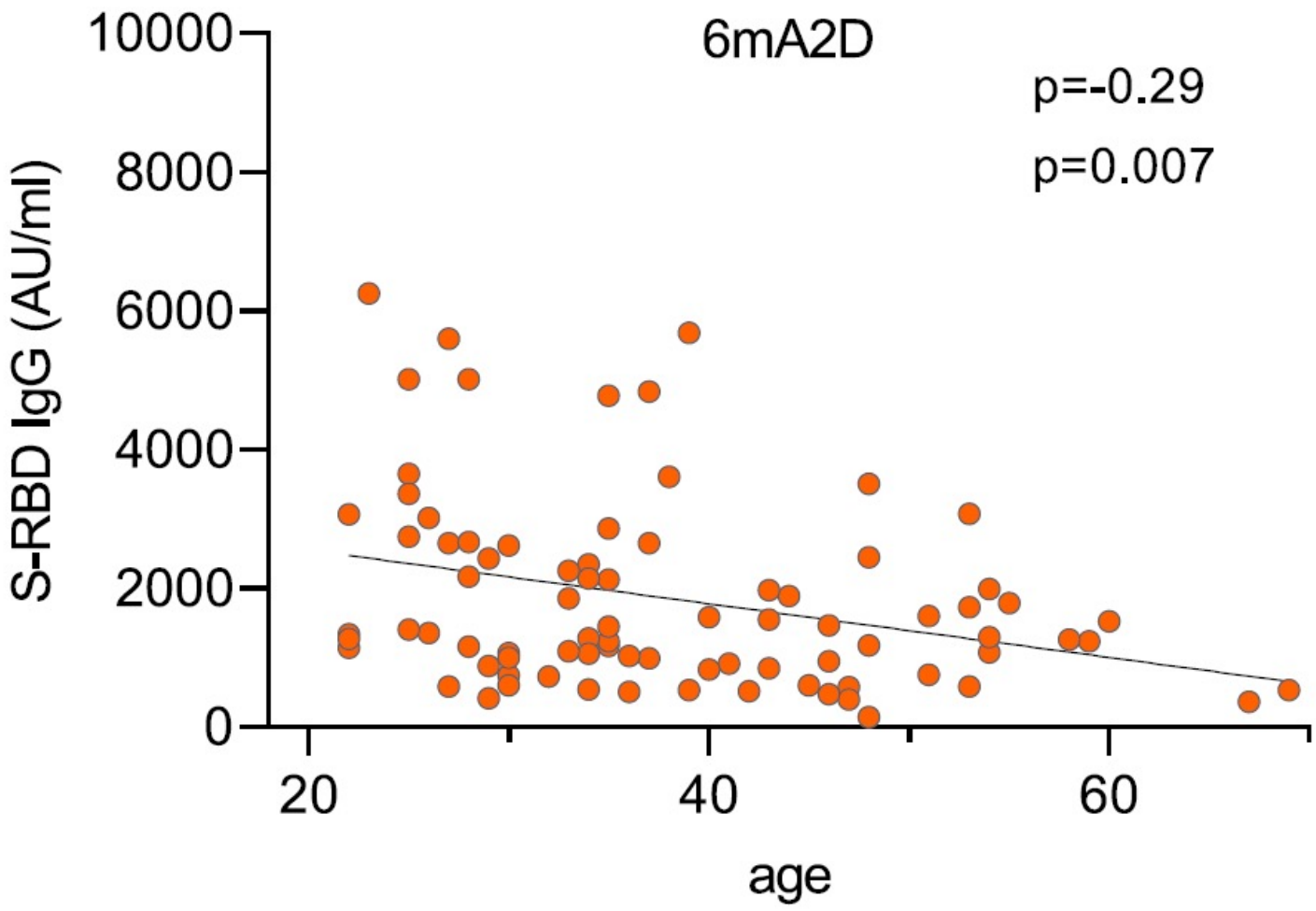


Fig. 4. Post-vaccination antibody responses correlate negatively with age.

edRxiv preprint doi: https://doi.org/10.1101/2021.08.01.21261297; this version posted August 4, 2021. The copyright holder for this preprint (which was not certified by peer review) is the author/funder, who has granted medRxiv a license to display the preprint in perpetuity. It is made available under a CC-BY-NC-ND 4.0 International license .

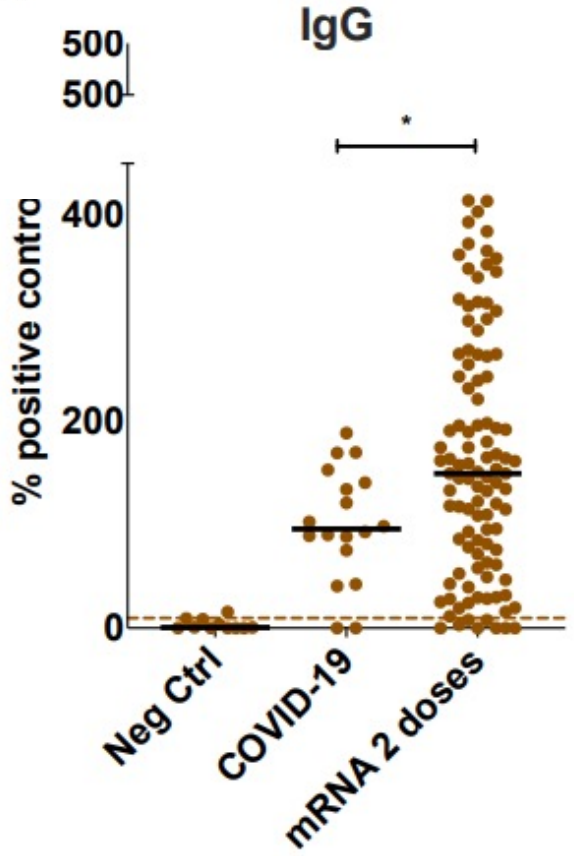
A mucosal antibody response is induced by intra-muscular SARS-CoV-2 mRNA vaccination

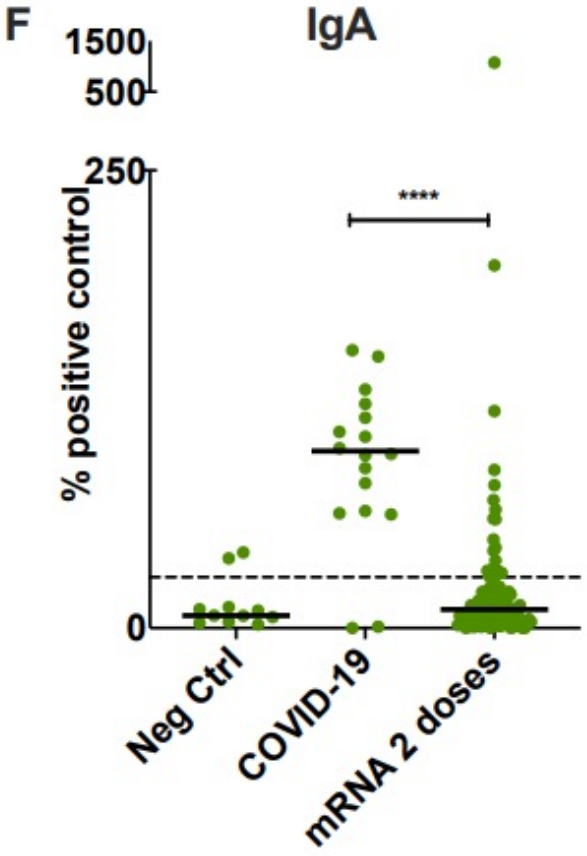
Salma Sheikh-Mohamed[1], Gary Y.C. Chao[*1], Baweleta Isho[1*], Michelle Zuo[*1], George R. Nahass[2], Rachel E. Salomon-Shulman[2], Grace Blacker[2], Mahya Fazel-Zarandi[3], Bhavisha Rathod[3], Karen Colwill[3], Alainna Jamal[3], Zhijie Li[4], Keelia Quin de Launay[5], Alyson Takaoka[5], Julia Garnham-Takaoka[5], Christina Fahim[5], Aimee Paterson[3], Angel Xinliu Li[3], Nazrana Haq[3], Shiva Barati[3], Lois Gilbert[3], Karen Green[3], Mohammad Mozafarihashjin[3], Philip Samaan[6], Walter L. Siqueira[7], Samira Mubareka[6,8], Mario Ostrowski[1,9,10], James M. Rini[4,11], Olga L. Rojas[12], Allison McGeer[3], Irving L. Weissman[2], Michal Caspi Tal[2], Sharon Straus[5], Anne-Claude Gingras[3,4,13], Jennifer L. Gommerman[1,13]

[1]Department of Immunology, University of Toronto, Toronto, Canada

[2] Institute for Stem Cell Biology and Regenerative Medicine and the Ludwig Cancer Center, Stanford University School of Medicine, Stanford, CA, USA

medRXiv





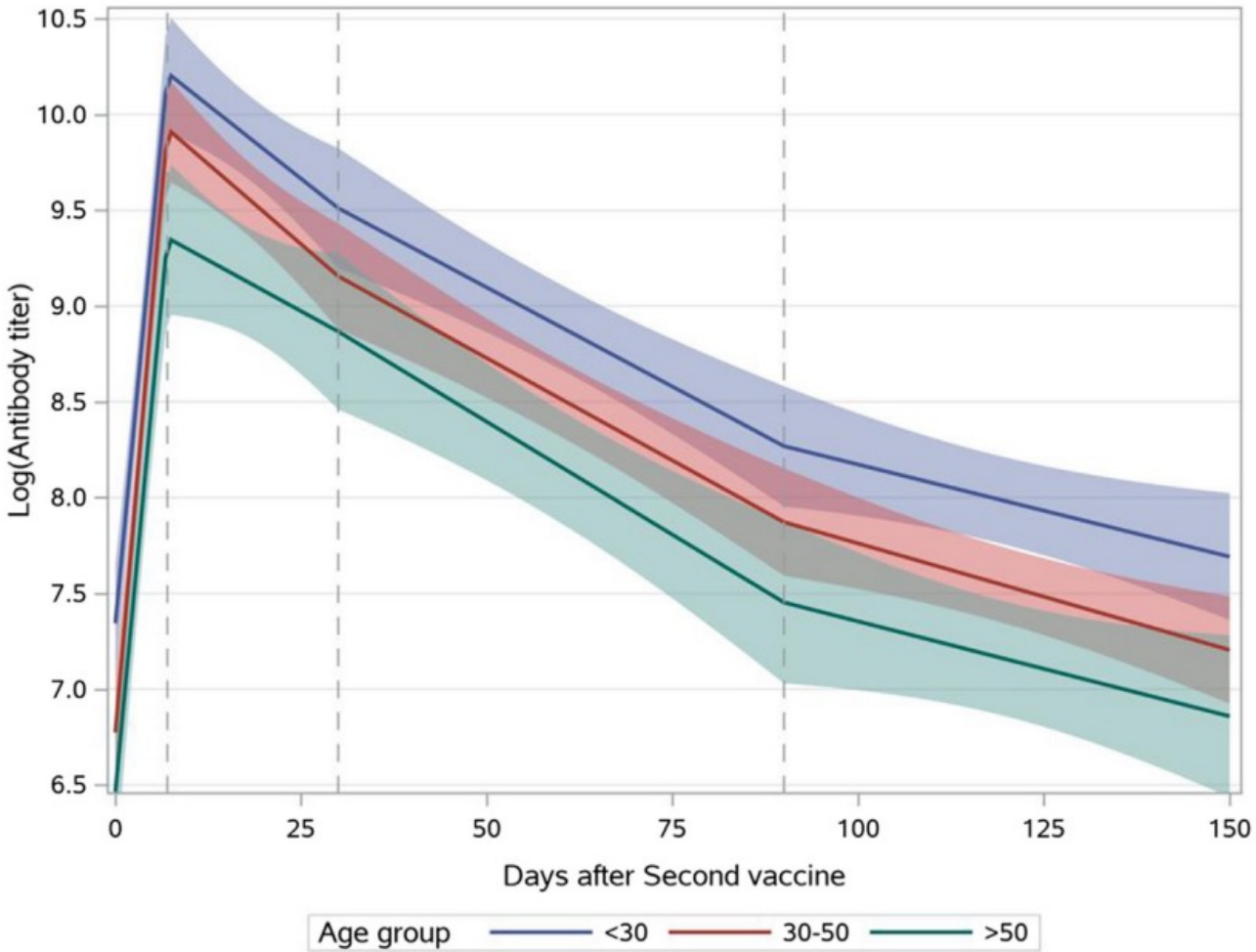
Contents lists available at ScienceDirect

Vaccine

journal homepage: www.elsevier.com/locate/vaccine

COVID-19 vaccine – Long term immune decline and breakthrough infections

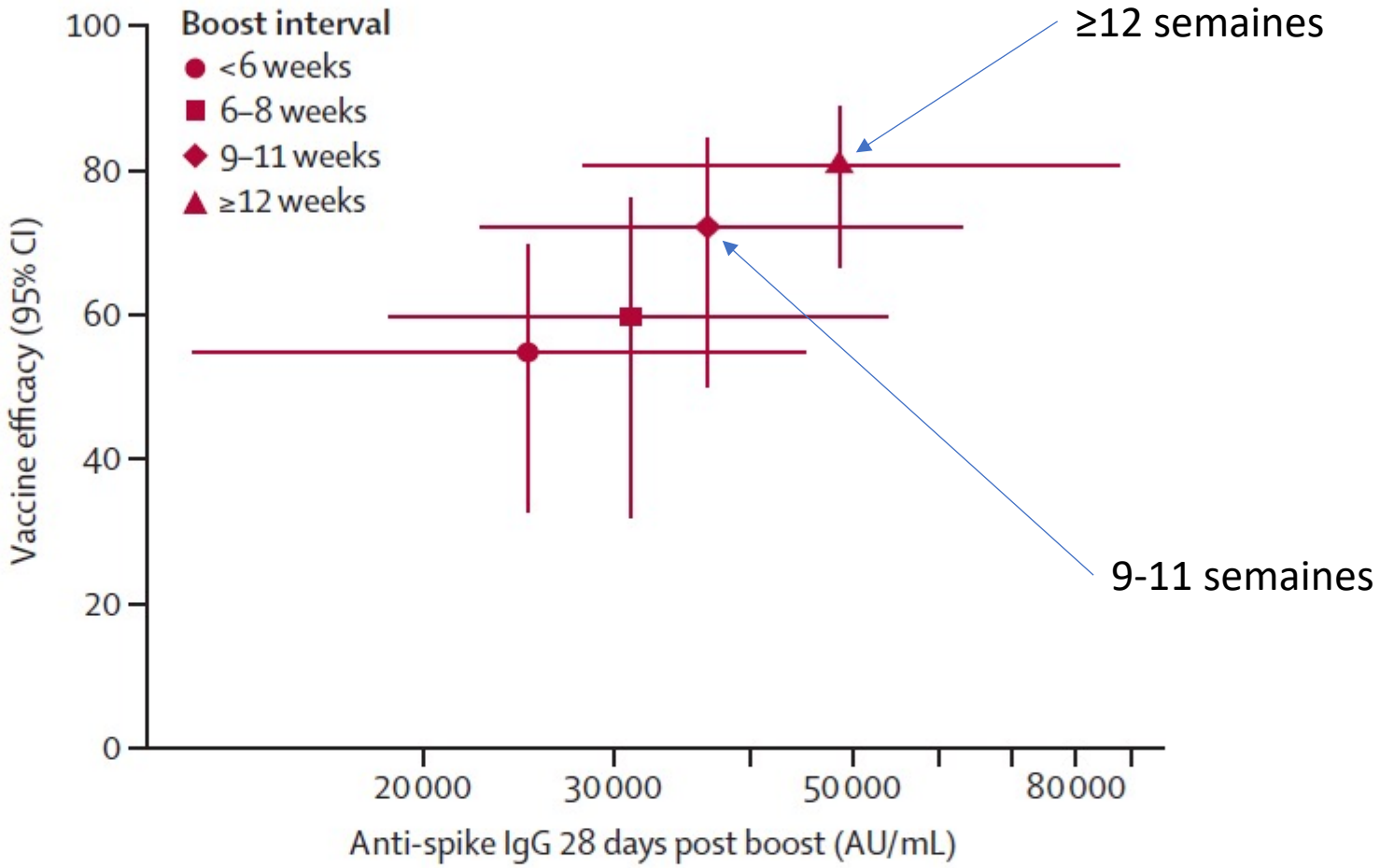
Johad Khoury [a,b,1,*], Ronza Najjar-Debbiny [b,c,1], Ayman Hanna [d], Adel Jabbour [e], Yara Abu Ahmad [d], Amer Saffuri [d], Majdole Abu-Sinni [a], Rashed Shkeiri [a], Ameer Elemy [f], Fahed Hakim [g]



Single-dose administration and the influence of the timing of the booster dose on immunogenicity and efficacy of ChAdOx1 nCoV-19 (AZD1222) vaccine: a pooled analysis of four randomised trials

Merryn Voysey*

Protection clinique



Taux d'anticorps

22 / 02 / 2021

nature medicine

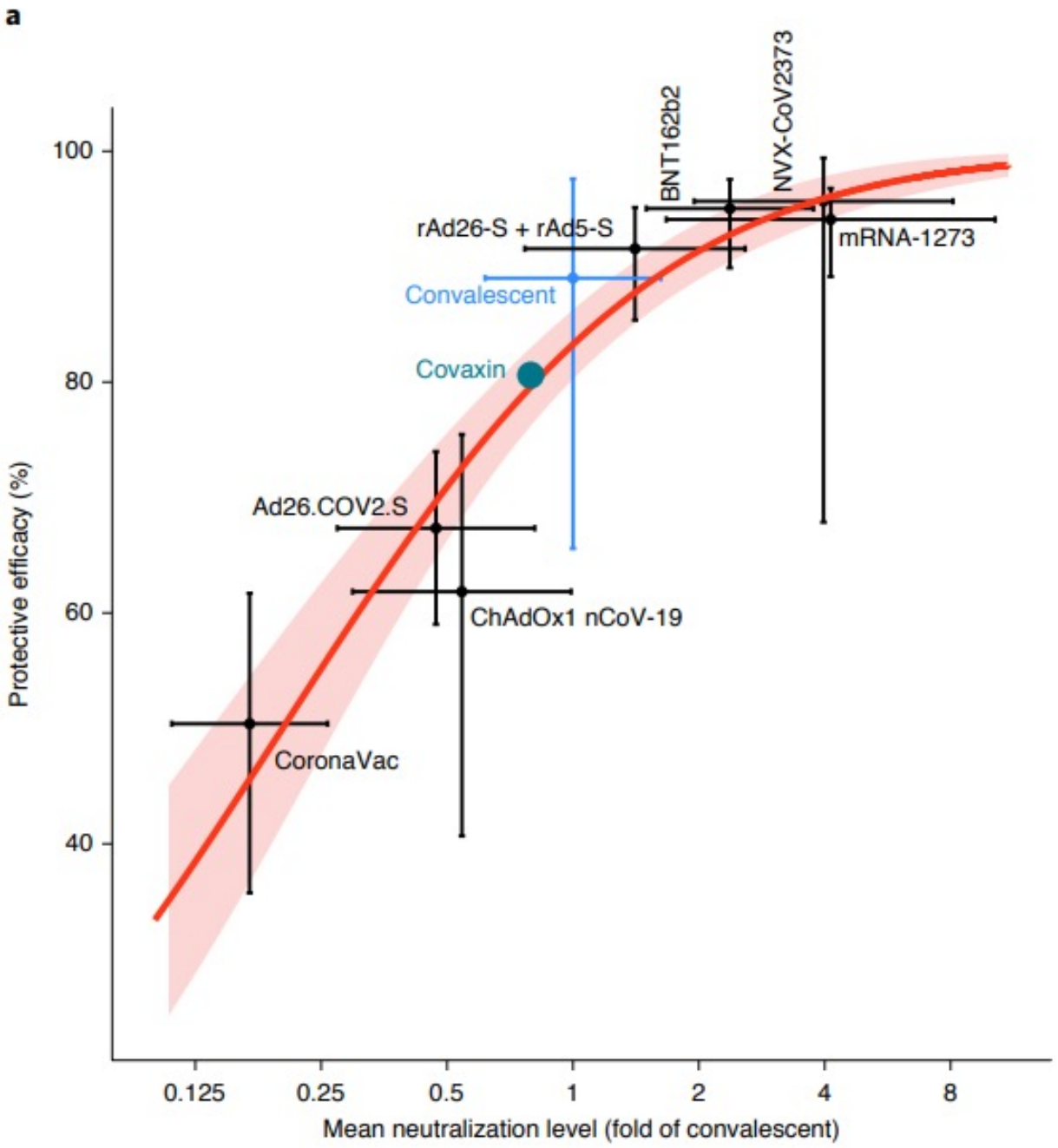
ARTICLES

https://doi.org/10.1038/s41591-021-01377-8

Check for updates

Neutralizing antibody levels are highly predictive of immune protection from symptomatic SARS-CoV-2 infection

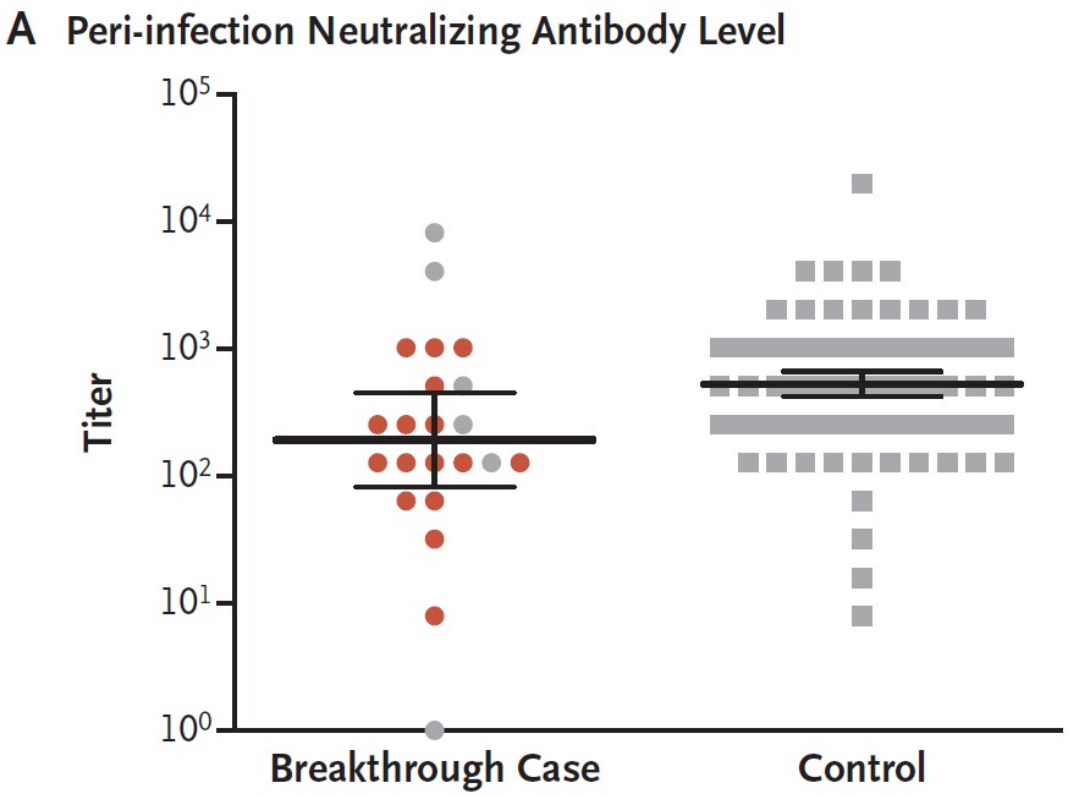
David S. Khoury[1,9], Deborah Cromer[1,9], Arnold Reynaldi[1], Timothy E. Schlub[1,2], Adam K. Wheatley[3], Jennifer A. Juno[3], Kanta Subbarao[3,4], Stephen J. Kent[3,5,6], James A. Triccas[7,8] ✉ and Miles P. Davenport[1] ✉



Covid-19 Breakthrough Infections in Vaccinated Health Care Workers

Moriah Bergwerk, M.B., B.S., Tal Gonen, B.A., Yaniv Lustig, Ph.D., Sharon Amit, M.D.,

Les cas d'infections chez les vaccinés sont en moyenne associés à des titres d'anticorps plus bas



ARTICLE

https://doi.org/10.1038/s41467-021-26672-3 OPEN

Check for updates

Correlation of SARS-CoV-2-breakthrough infections to time-from-vaccine

Barak Mizrahi[1,6], Roni Lotan[2,6✉], Nir Kalkstein[1], Asaf Peretz[2,3], Galit Perez[2], Amir Ben-Tov[2], Gabriel Chodick[4,5], Sivan Gazit[2,5] & Tal Patalon[2,5]

Période de vaccination :

January-February

March-April

Les cas d'infections chez les vaccinés sont plus fréquents quand la vaccination est plus ancienne

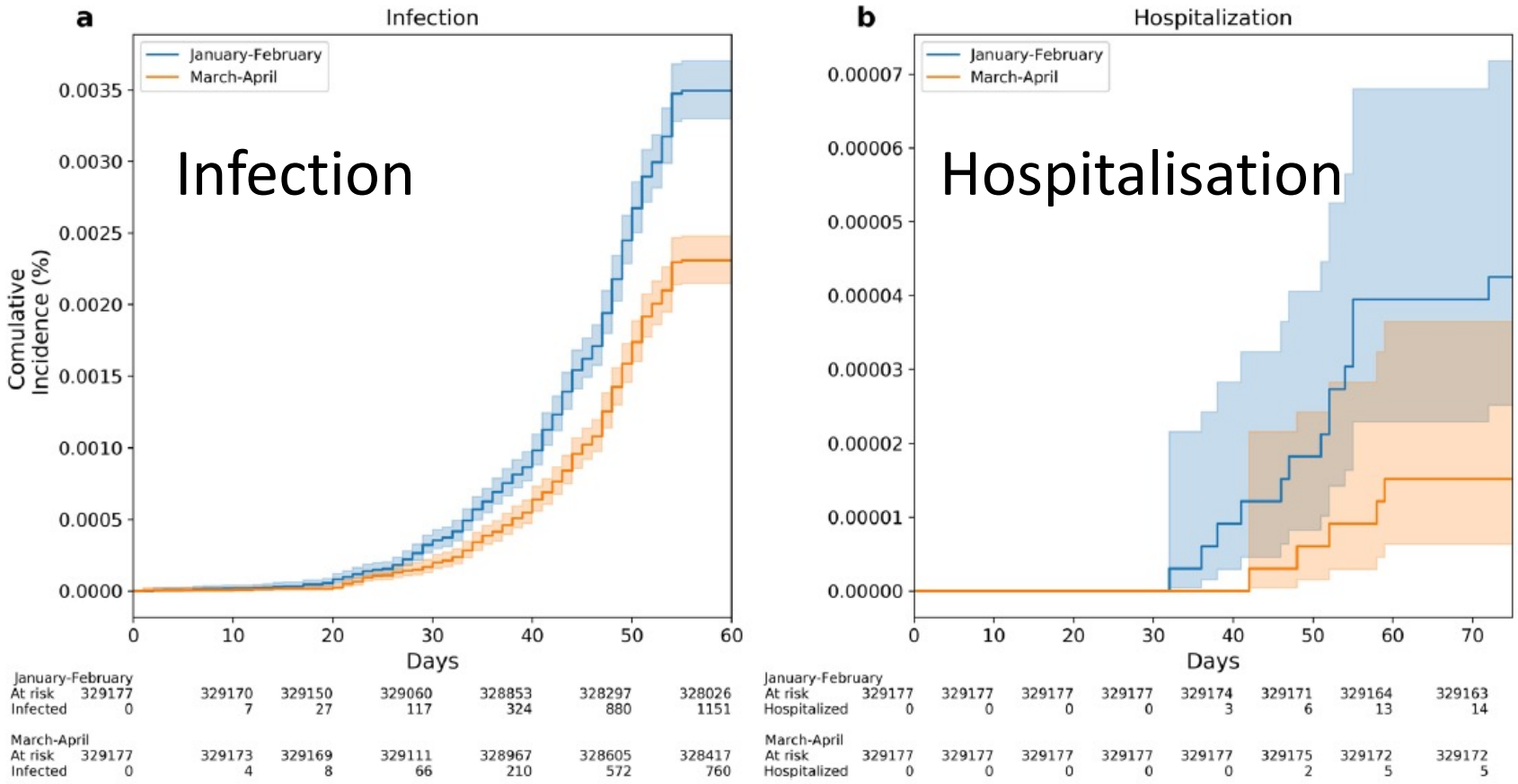
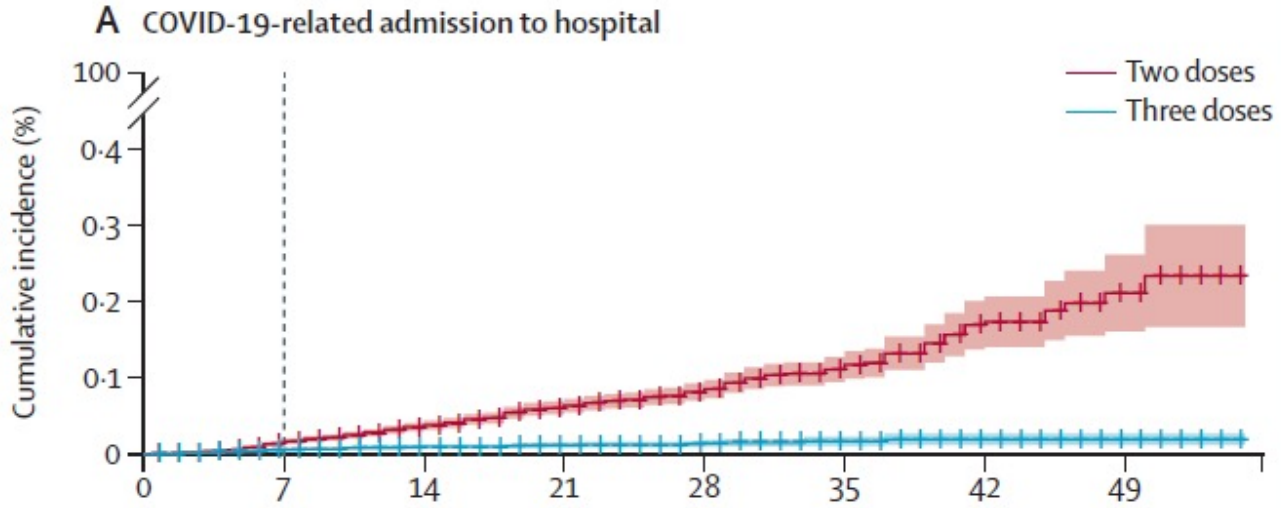


Fig. 2 Accumulative breakthorough infections and hospitalizations among Early and Late Vaccinnes during June - July 2021, Israel. Kaplan-Meier

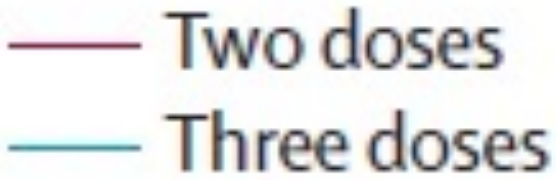
Effectiveness of a third dose of the BNT162b2 mRNA COVID-19 vaccine for preventing severe outcomes in Israel: an observational study

Noam Barda, Noa Dagan*, Cyrille Cohen, Miguel A Hernán, Marc Lipsitch, Isaac S Kohane, Ben Y Reis†, Ran D Balicer†*

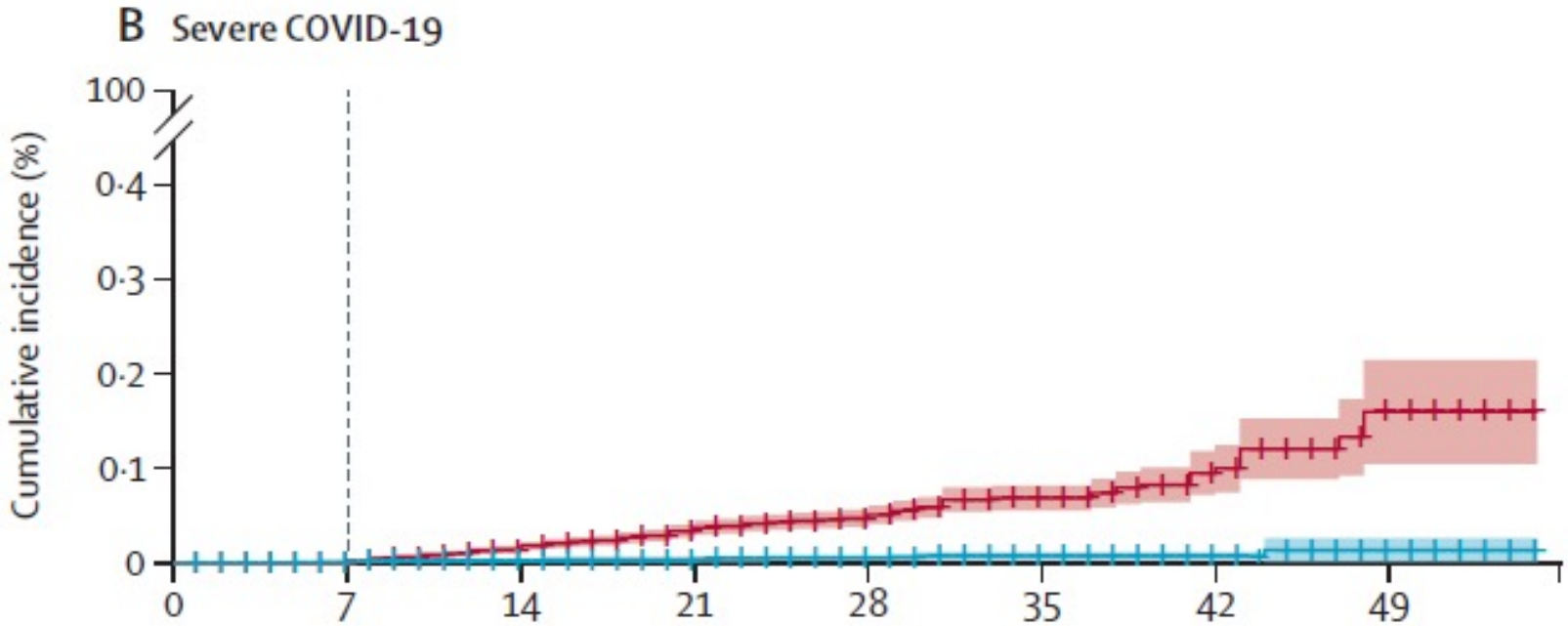
La réalisation d'une 3ème dose, en rappel, permet d'éviter des infections



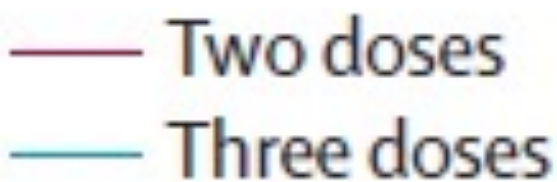
Number at risk									
Two doses	728 321	471 082	301 296	202 547	107 638	47 619	21 759	6368	..
Three doses	728 321	471 181	301 542	202 900	108 036	48 018	22 071	6502	..
Cumulative number of events									
Two doses	0	91	167	229	259	282	299	303	..
Three doses	0	31	46	51	54	56	57	57	..



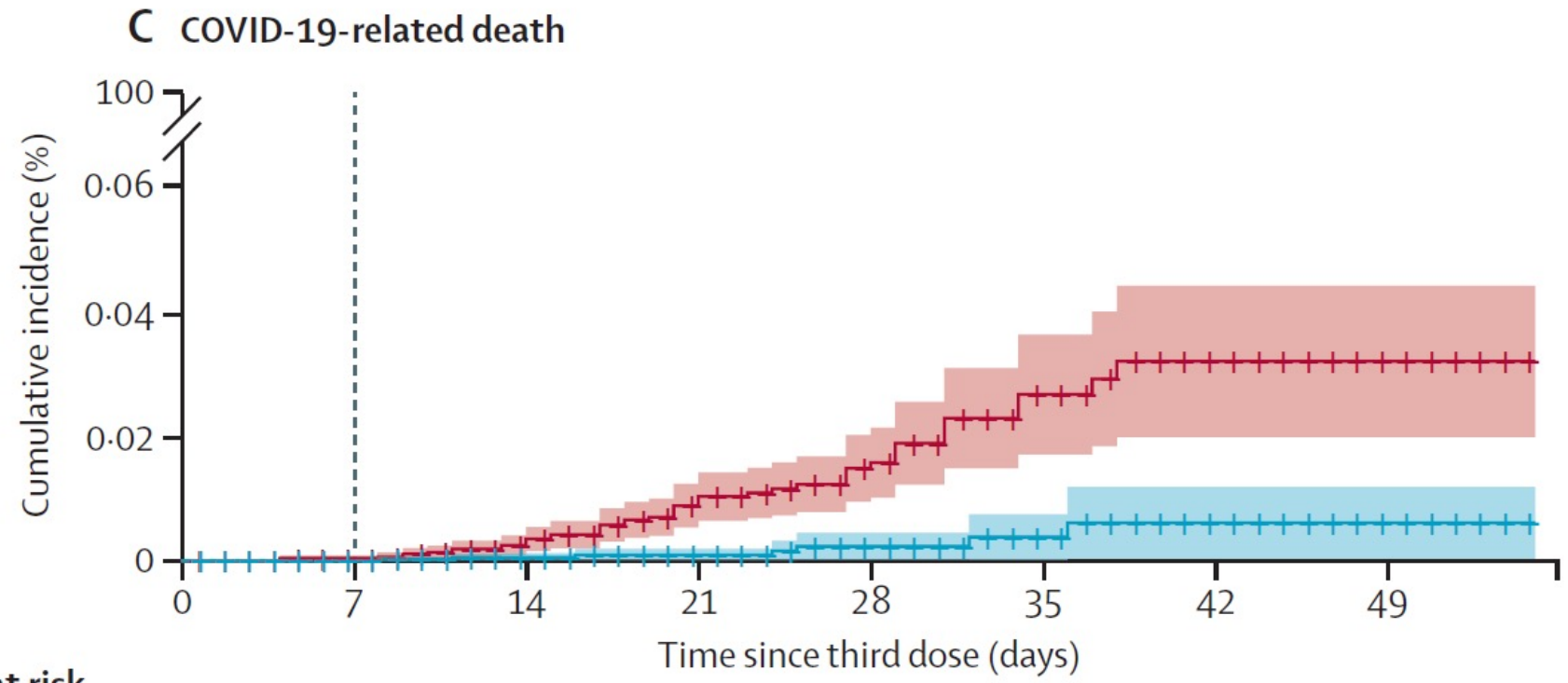
Pas de sujets avec une infection SARS-CoV-2 préalable – temps minimal depuis la 2ème dose : 5 mois



Number at risk									
Two doses	728 321	471 147	301 395	202 655	107 748	47 709	21 839	6400	..
Three doses	728 321	471 200	301 561	202 919	108 050	48 025	22 076	6504	..
Cumulative number of events									
Two doses	0	12	71	116	135	149	158	165	..
Three doses	0	10	14	18	20	22	22	23	.



Pas de sujets avec une infection SARS-CoV-2 préalable – temps minimal depuis la 2ème dose : 5 mois



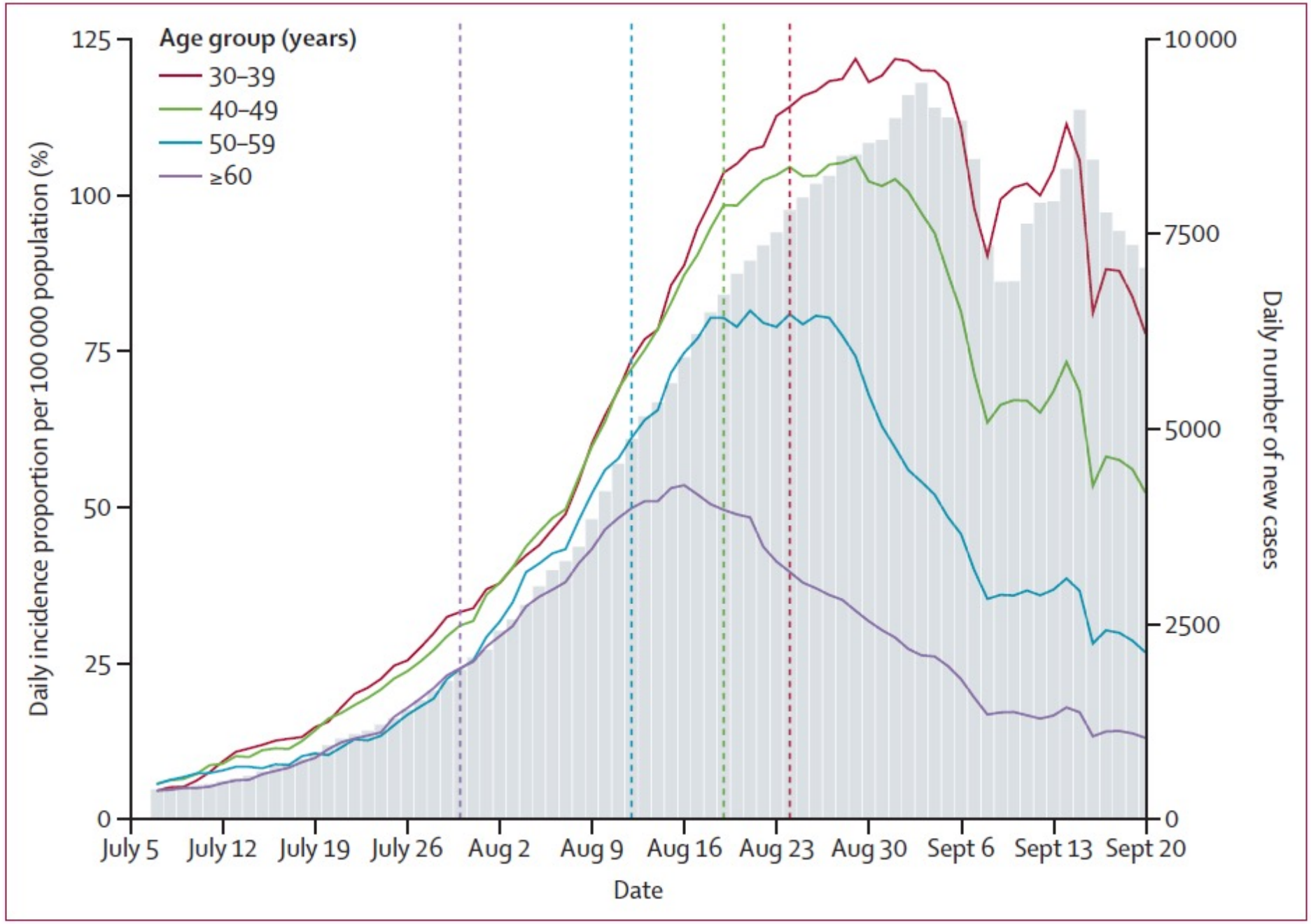
Number at risk									
Two doses	728 321	471 153	301 443	202 735	107 836	47 796	21 911	6435	..
Three doses	728 321	471 205	301 567	202 924	108 056	48 030	22 078	6505	..
Cumulative number of events									
Two doses	0	2	13	29	36	44	46	46	..
Three doses	0	0	2	3	5	6	7	7	..

Two doses

Three doses

Pas de sujets avec une infection SARS-CoV-2 préalable – temps minimal depuis la 2ème dose : 5 mois

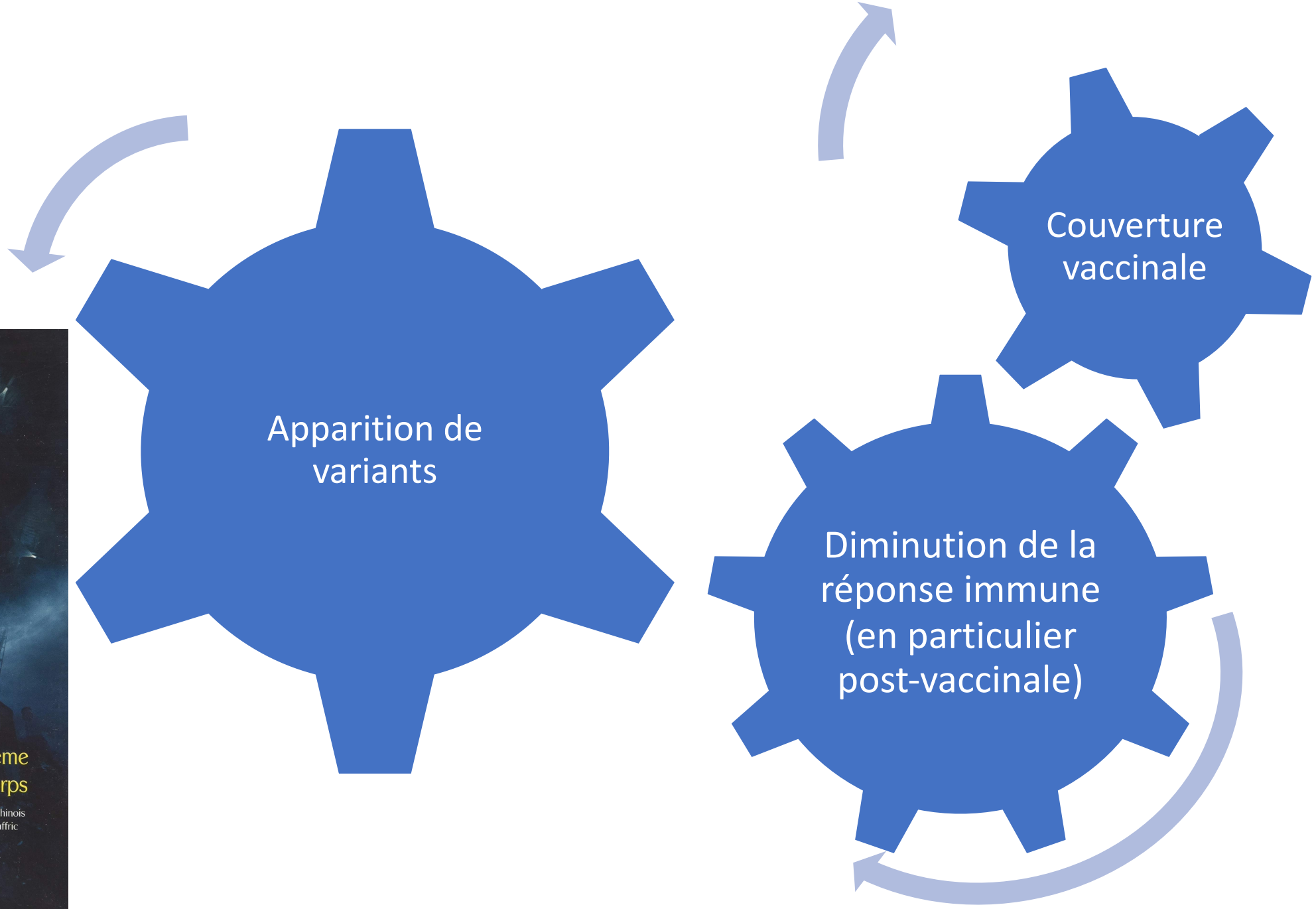
	Total number in analysis (both study groups combined)	Vaccinated with two doses		Vaccinated with three doses		1 – risk ratio (95% CI)	Risk difference per 100 000 individuals (95% CI)
		Events	Risk per 100 000 individuals	Events	Risk per 100 000 individuals		
Admissions to hospital							
Age group, years							
16–39	288 072	6	7·0	1	2·1	70% (–70 to 100)	4·9 (–2·1 to 12·3)
40–69	448 366	73	104·9	10	8·1	92% (83 to 97)	96·7 (60·1 to 148·7)
≥70	162 958	140	574·3	16	41·3	93% (87 to 97)	533·0 (390·1 to 675·3)
Severe disease							
Age group, years							
16–39	288 086	2	2·5	0	0·0	NA	2·5 (0·7 to 7·5)
40–69	448 410	38	57·9	5	3·5	94% (85 to 99)	54·4 (28·0 to 87·6)
≥70	163 054	108	447·5	10	35·8	92% (83 to 98)	411·7 (285·9 to 548·7)


Age group (years)
30–39
40–49
50–59
≥60
Daily incidence proportion per 100 000 population (%)
125
100
75
50
25
0
Daily number of new cases
10 000
7500
5000
2500
0
July 5
July 12
July 19
July 26
Aug 2
Aug 9
Aug 16
Aug 23
Aug 30
Sept 6
Sept 13
Sept 20
Date

Conclusions quant à l’immunité post-vaccinale

- Taux initiaux d’anticorps plus élevés qu’après infection
- Diminution ensuite plus rapide qu’après infection
- Réponse IgA essentiellement post-infectieuse, non post-vaccination
- Diminution associée au risque d’infection
  - D’où la préconisation d’un rappel

LIU
CIXIN
Le Problème
à trois corps
roman traduit du chinois
par Gwennaël Gaffric
BABEL


Apparition de variants
Couverture vaccinale
Diminution de la réponse immune (en particulier post-vaccinale)