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Country: Portugal

Affiliation:

University of Lisbon Medical School

Function: Head of Immunology Department

Main expertise:

Immunology; immune regulation

Past Chair of the NITAG for seasonal vaccination

Vaccination of the Immunocompromised

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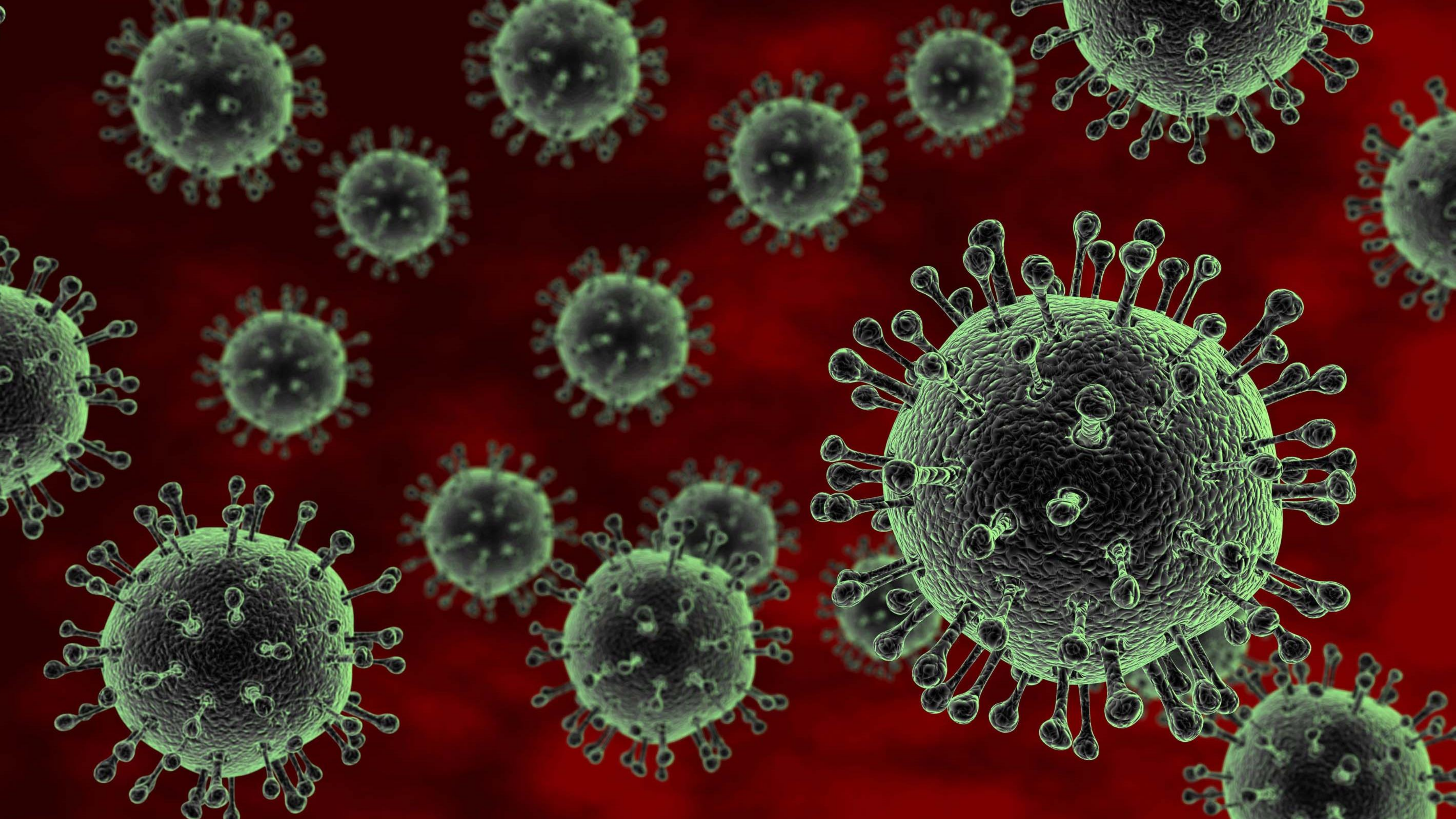
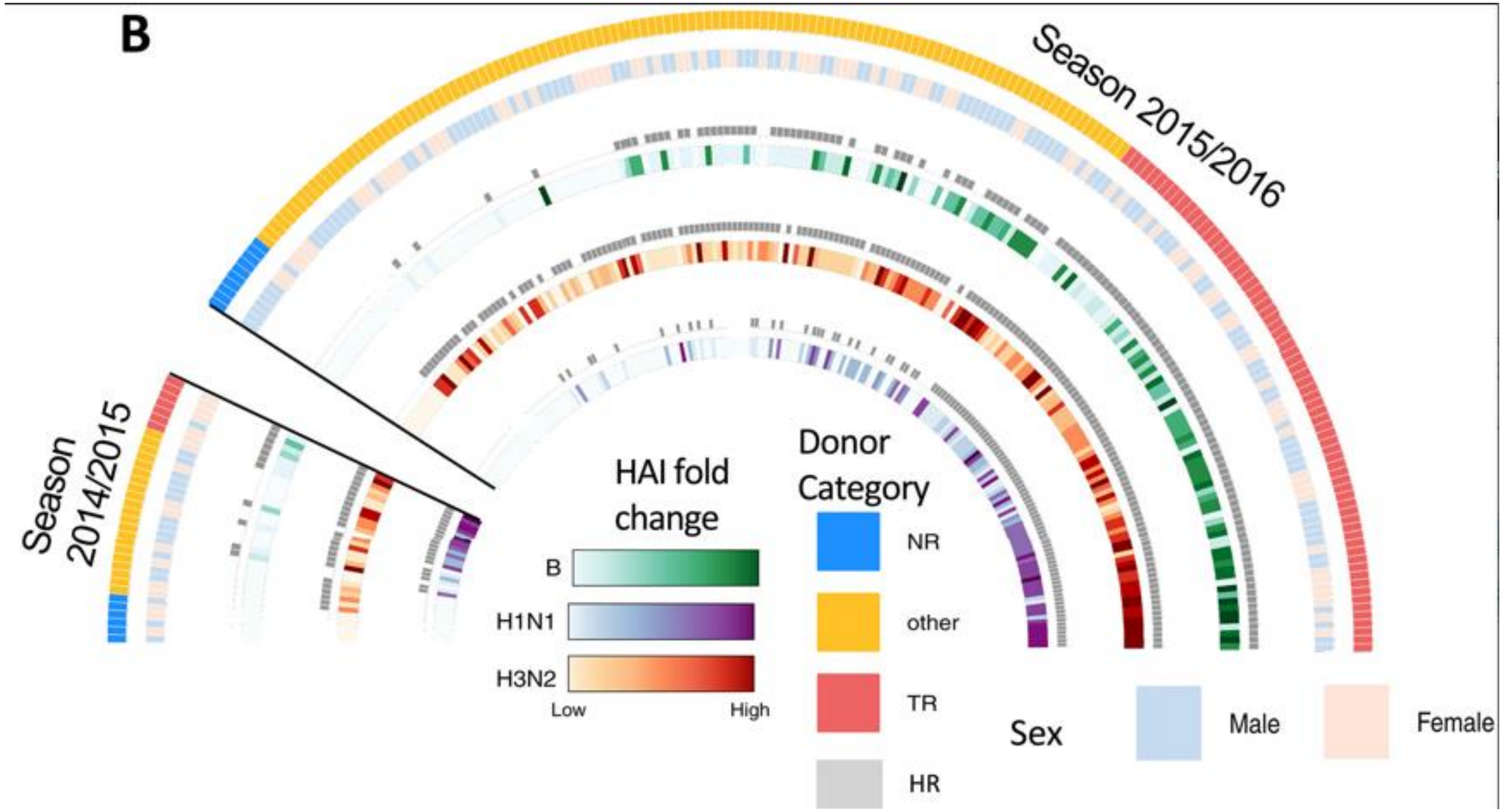
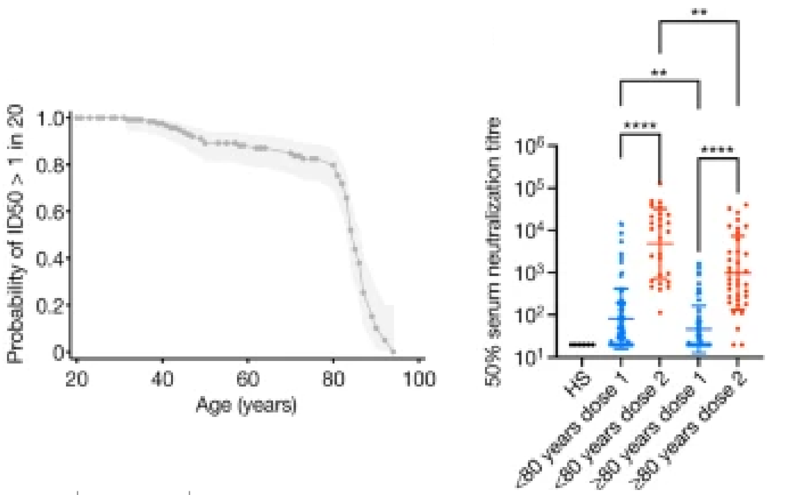


Not all individuals respond equally to vaccination



Systemic dysregulation and molecular insights into poor influenza vaccine response in the aging population

Kumar et al., *Science Adv* 2024



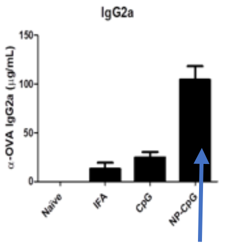
Article | Open Access | Published: 30 June 2021

Age-related immune response heterogeneity to SARS-CoV-2 vaccine BNT162b2

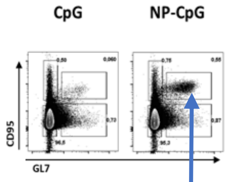
Dami A. Collier, Isabella A. T. M. Ferreira, ... Ravindra K. Gupta + Show authors

Nature **596**, 417–422 (2021) | Cite this article

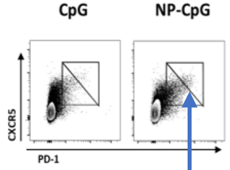
Nanomaterials can improve vaccination response



more antibodies

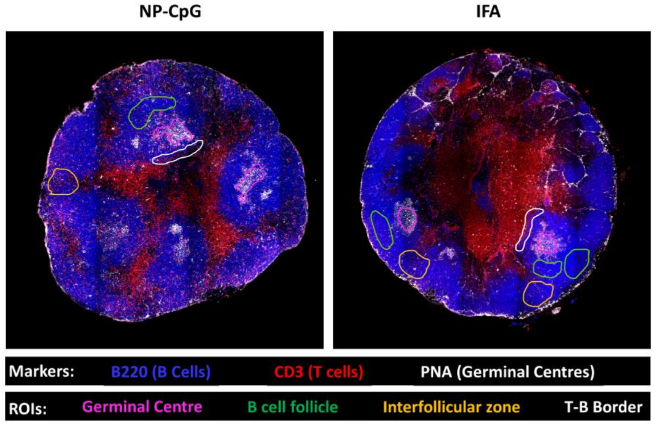


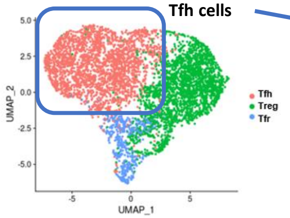
greater GC response

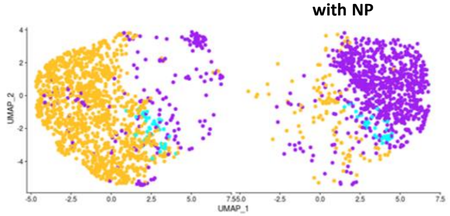


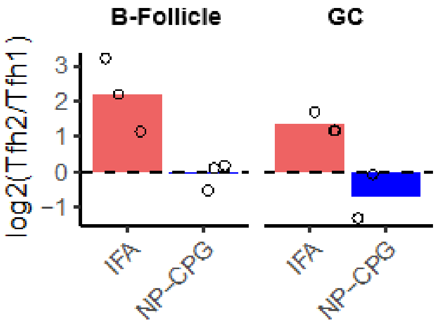
more Tfh cells

Spatial transcriptomics









Ribeiro F, *et al*. *unpublished*

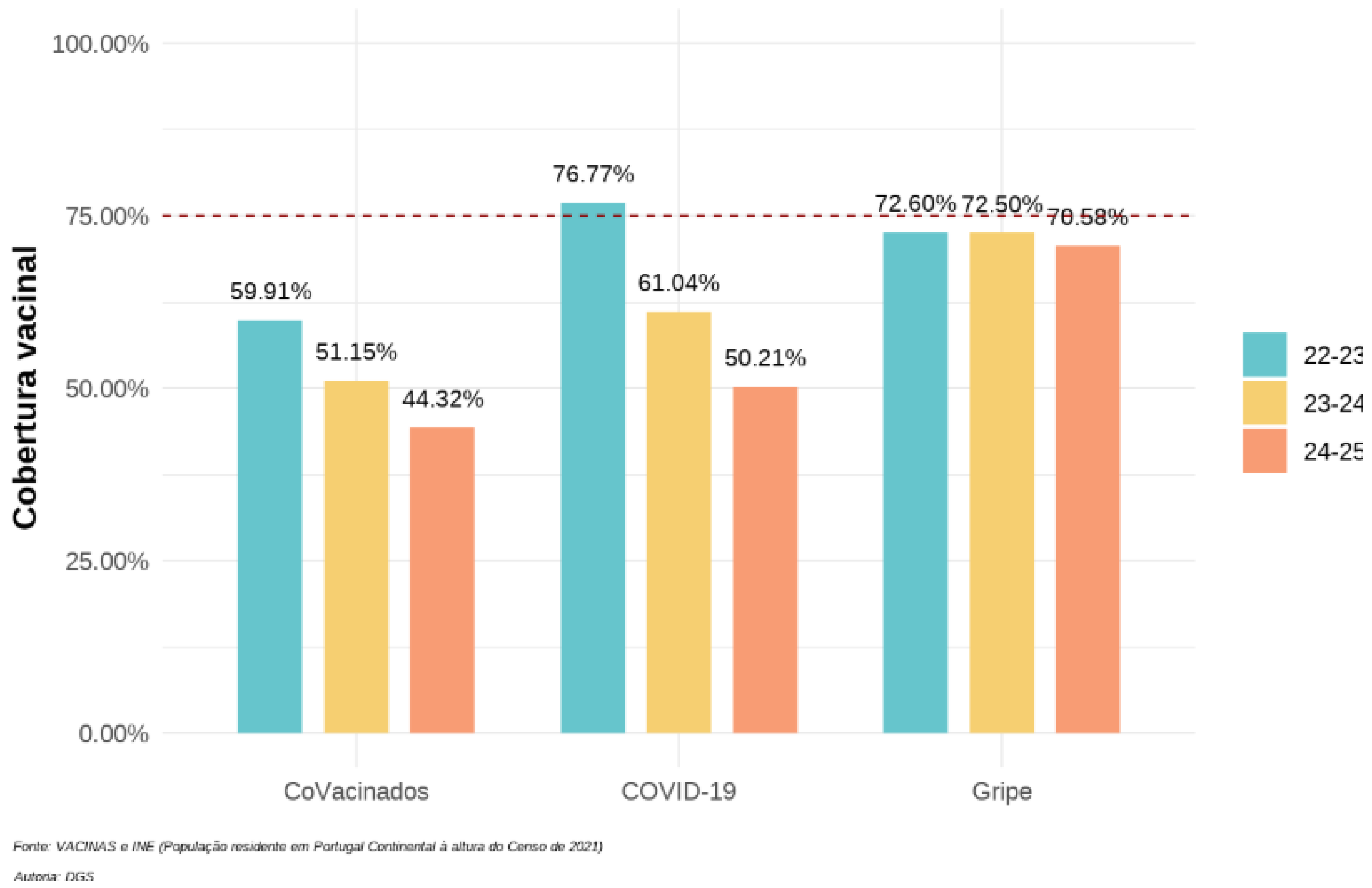
Vaccination of the immunocompromised

- Recommendations in the Blue Book of Vaccines

- One constraint for an accurate assessment of the impact is the insufficient data regarding uptake and effectiveness with adequate stratification.

The sharp decline of COVID-19 vaccination coverage

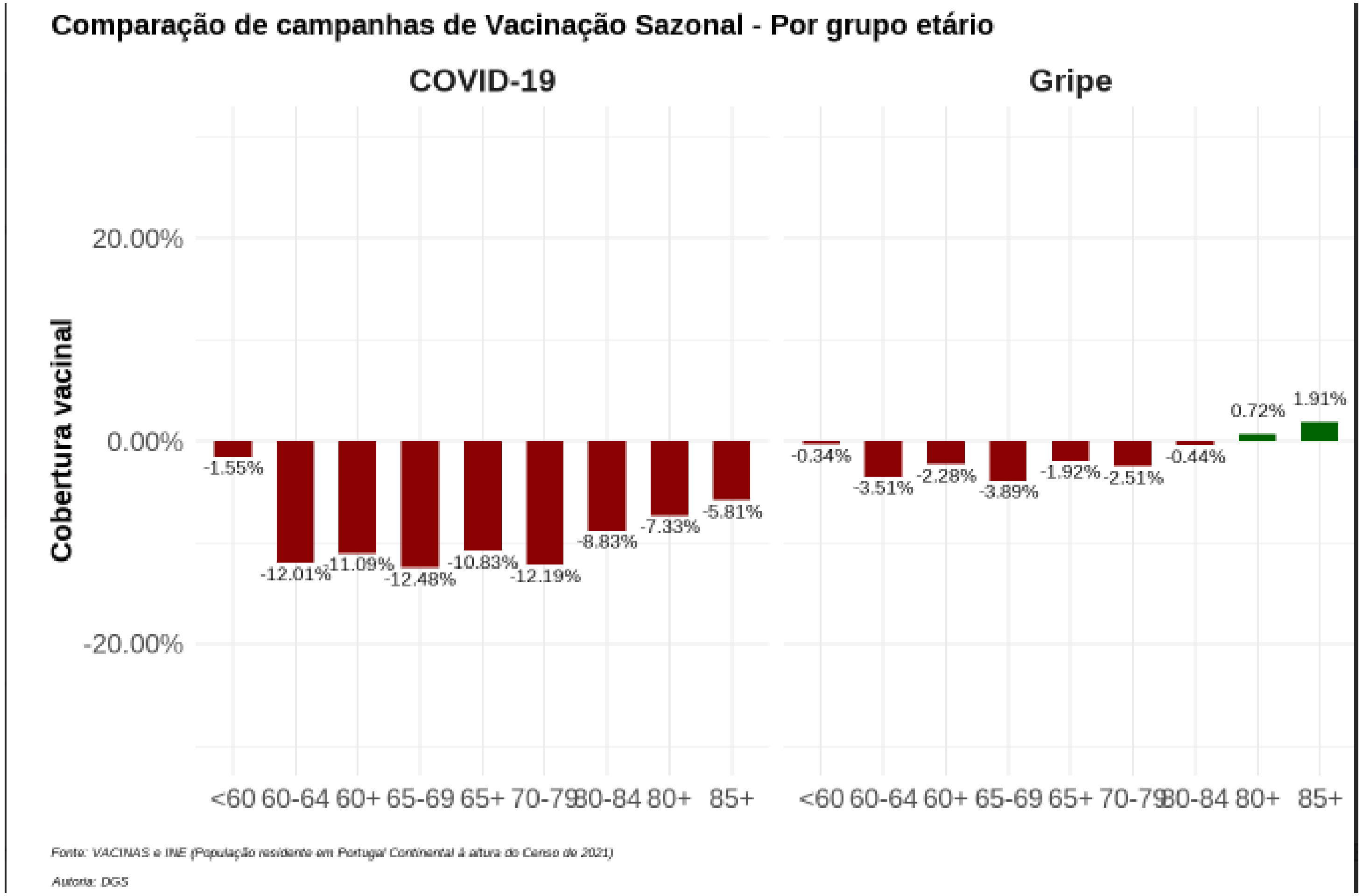
Vaccination coverage in individuals 65 years old and older



	COVID-19	Influenza	Diference COVID-19/ /Influenza
Season 23-24	1 992 430	2 495 305	-502 875 (20, 1%)
Seazon 24-25	1 569 092	2 405 201	-836 109 (34.8%)
Difference	-423 338	-90 104	
% Difference	**-21,2%**	**-3,6%**	

Data: Vacinas, DGS (data until 27.04.2025); Seasonal vaccination report 29.04.2025, DGS

The decline of COVID-19 vaccination coverage affected all age groups

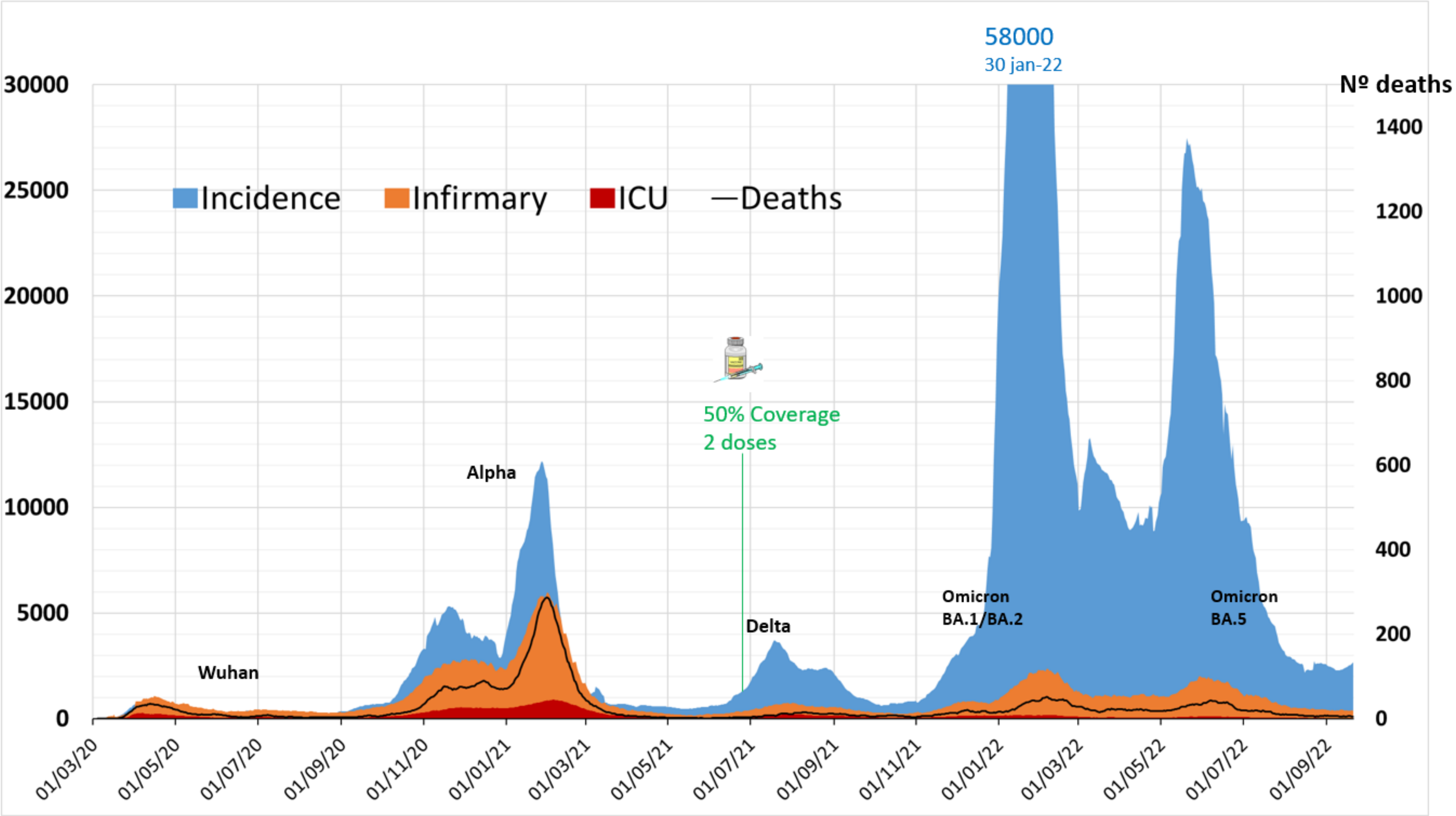


Data: Vacinas, DGS (data until 27.04.2025); Seasonal vaccination report 29.04.2025, DGS

The COVID-19 vaccination legacy: a changed risk perception

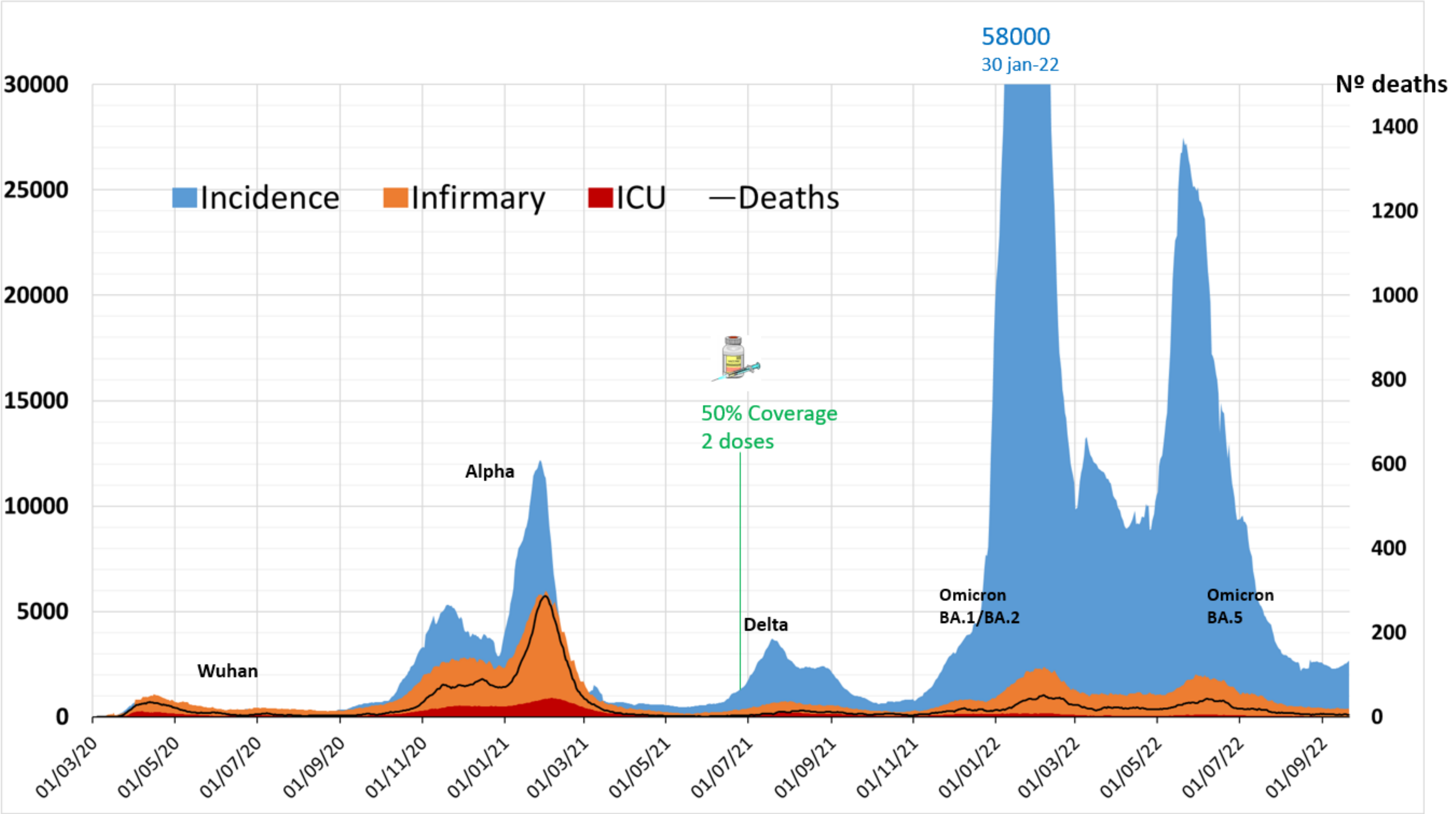
Hospital Santa Maria, Lisbon, Jan 2021

Vaccines save lives
The success of vaccination eliminates risk perception



Carmo-Gomes et al., ***Unpublished***

The state of population vulnerability and the characteristics of the virus change with time



Carmo-Gomes et al., ***Unpublished***

Hybrid immunity protection against Omicron subvariants

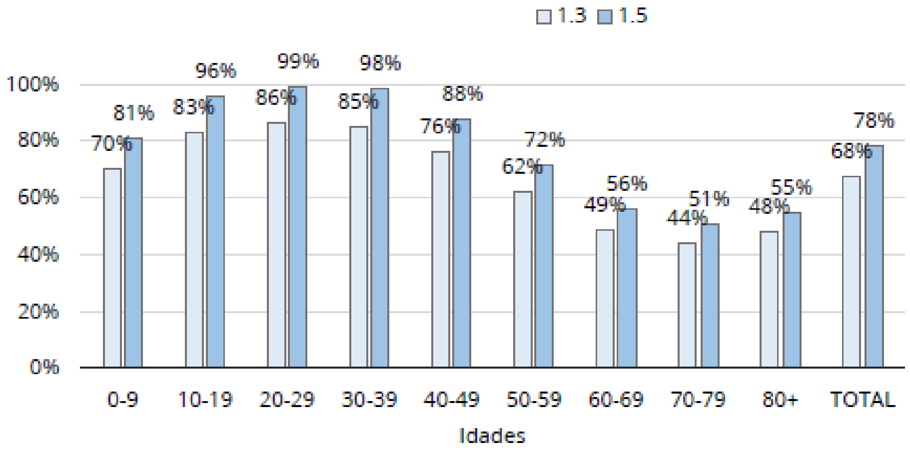
Risk of BA.5 infection among people exposed to previous SARS-CoV-2 variants

Malato (…) Graca. 2022, ***New Engl J Med,*** 10.1056/NEJMc2209479

Stability of hybrid immunity protection against BA.5 infection

Malato (…) Graca. 2023, ***Lancet Infect Dis***. 10.1016/S1473-3099(22)00833-7
Malato (…) Graca, ***medRxiv***, https://www.medrxiv.org/content/10.1101/2022.08.16.22278820v1

% Infected individuals since the start of the COVID-19 pandemic

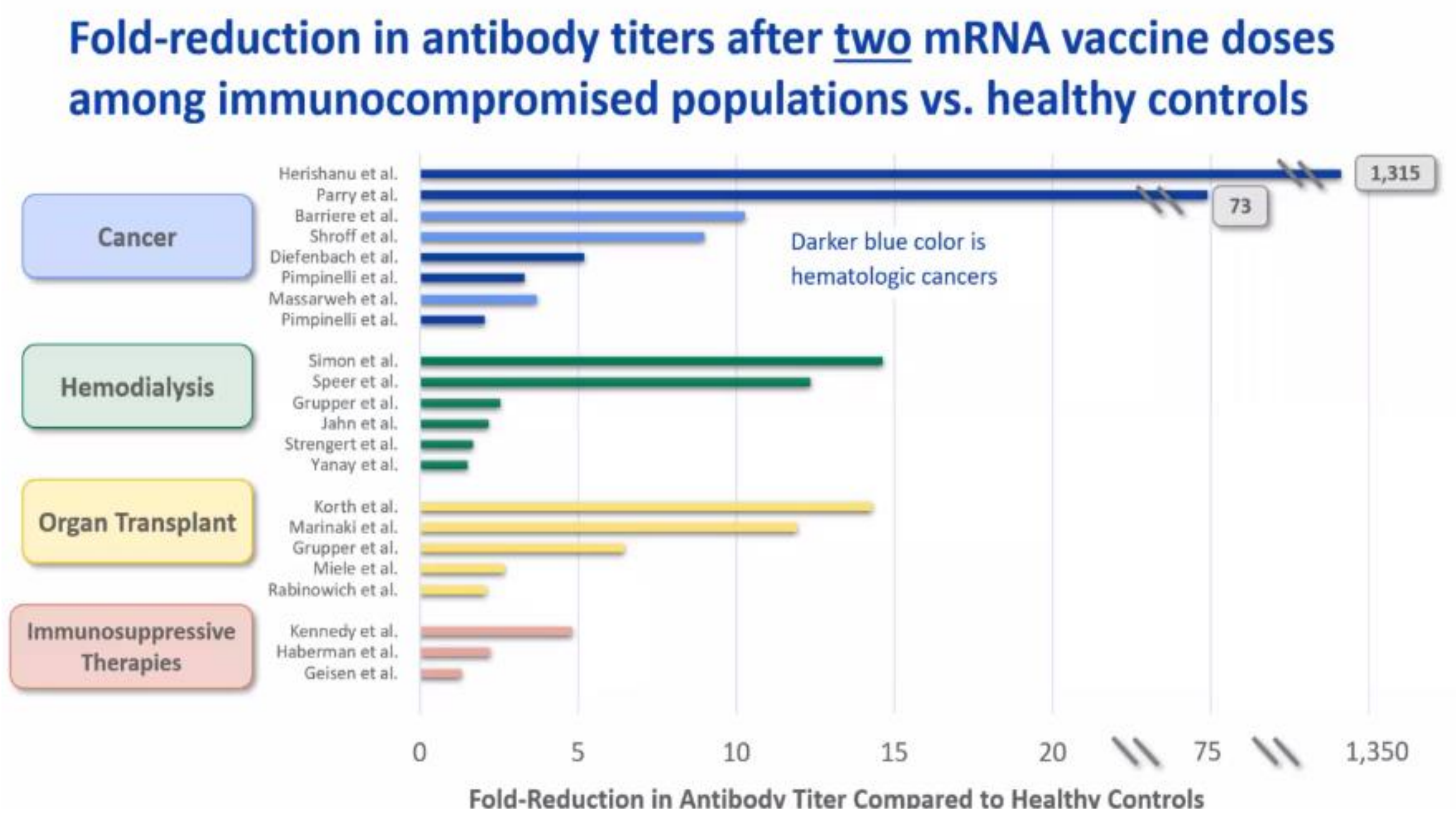


MC Gomes, data from the Portuguese registry, ***Jan 2023*** (unpublished)

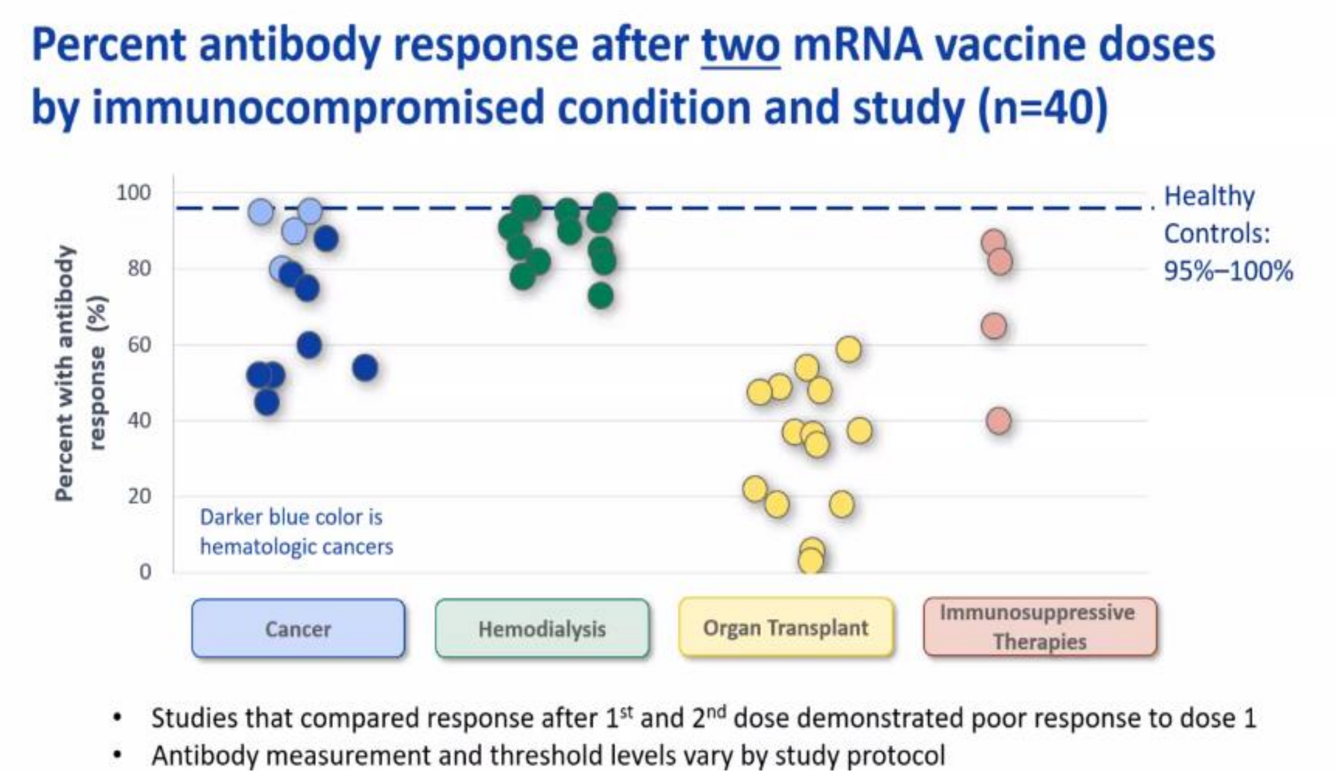
Light blue bars
The last national serologic survey from ***November 2021 estimated ~30% unreported cases*** (pre-omicron).

Dark blue bars
The frequency of unreported cases, following Omicron's high infectious rates and recent reduction in testing, must be higher (dark blue, 50%)

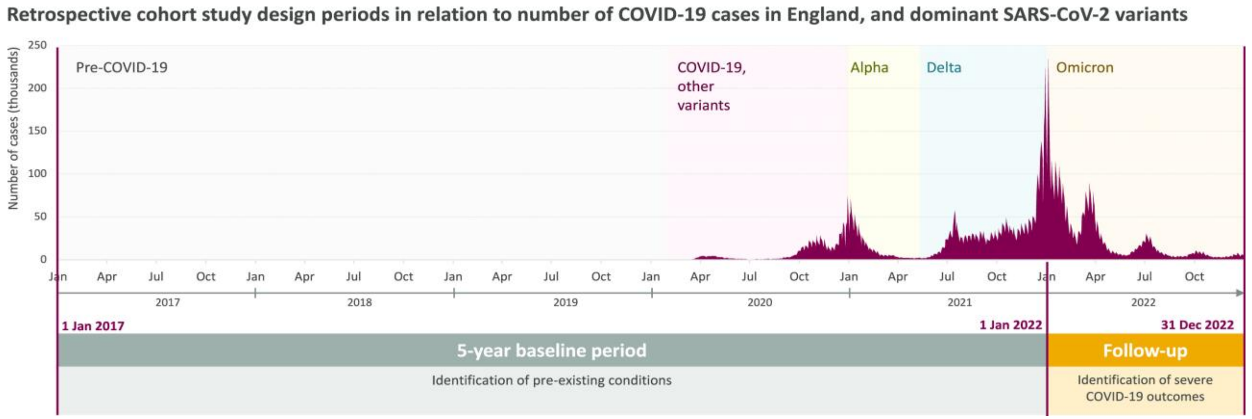
Specific groups (namely immunocompromised individuals) have suboptimal protection

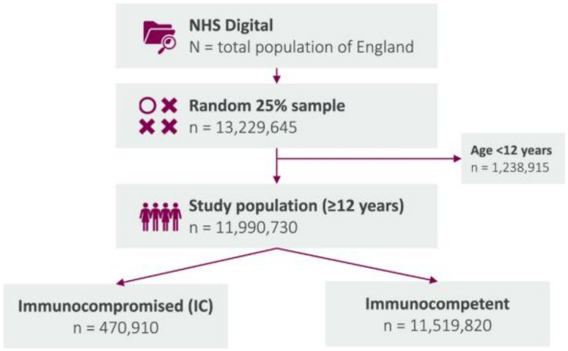


Specific groups (namely immunocompromised individuals) have suboptimal protection



INFORM study





INFORM study; Evans *et al. Lancet, 2023*

Vulnerability of immunocompromised individuals

Our objective within END-VOC

	Portugal	Switzerland*	UK	Total
Hematopoietic Stem Cell Transplantation	872	-	5,100	5,972
Solid Organ Transplantation	8,349	995	558,925	568,269
Immunosuppression (Other Severe)	4,578	1,286	538,565	544,429
Haematological cancers	22,508	-	325,110	347,618
Primary Immunodeficiencies	4,578	-	62,240	66,818
Chemo/Radiotherapy	80,747	6,815	452,895	540,457
Overall Total				**2,073,563**

Table 1. Frequency of immunosuppression in the participating registries (preliminary analysis).
* numbers with haematological cancers and transplants included in Immunosuppression.

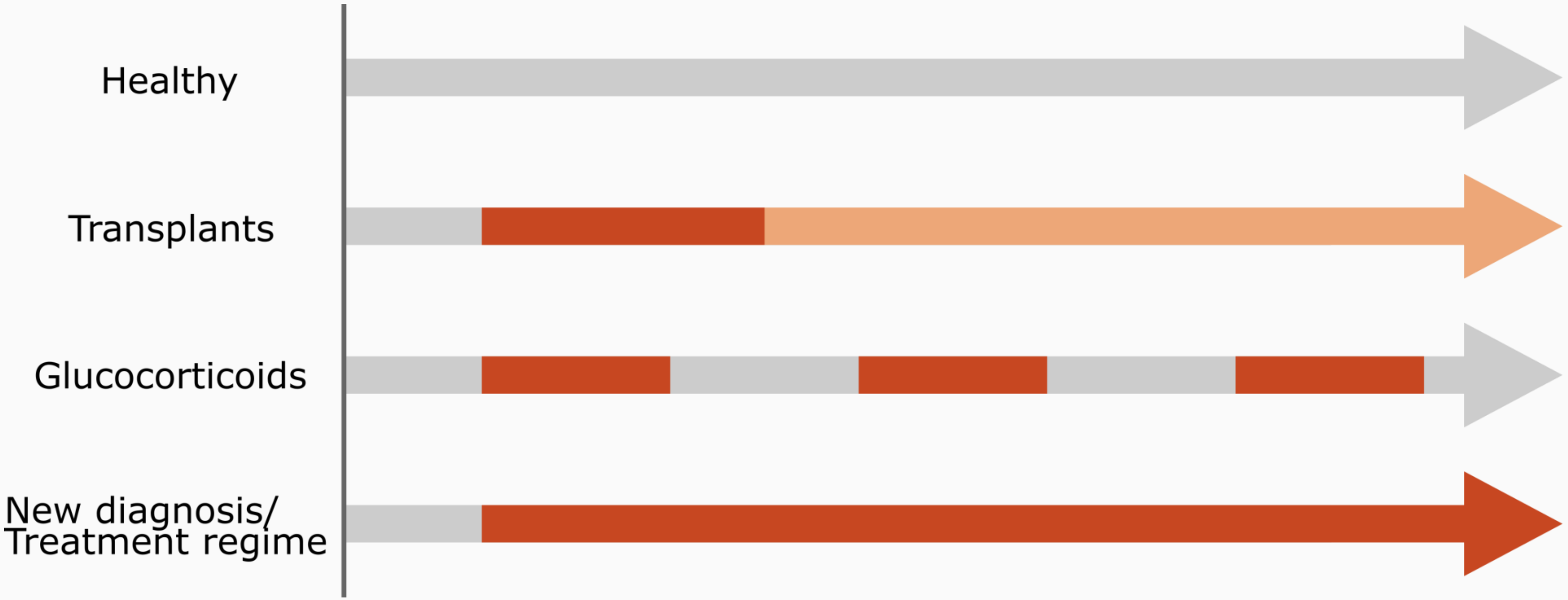
Project END-VOC

Ongoing Analyses & Progress

1. Glucocorticoids
   - High dose
   - Low dose
2. Interferons
3. Bio disease-modifying antirheumatic drugs (DMARDS) + targeted therapies
   - TNF inhibitors
   - JAK inhibitors
   - Interleukin inhibitors
   - Complement inhibitors
   - Proteasome inhibitors
   - T cell targeting
   - B cell targeting
   - Immune checkpoint
4. Systemic immunosuppressants
   - mTOR inhibitors
   - Calcineurin inhibitors
5. Immunomodulators
6. Chemotherapy agents
   - Cytotoxic antibiotics
   - Alkylating agents
   - Antimetabolites
   - Topoisomerase inhibitors
   - Mitotic inhibitors

Funded by the European Union under grant agreement N.101046314.
Views and opinions are those of the author(s) only and do not necessarily reflect those of the European Union.

Ongoing Analyses & Progress



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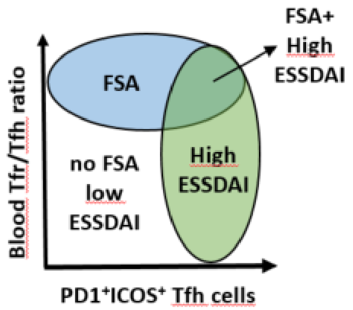
Discoveries are made of People

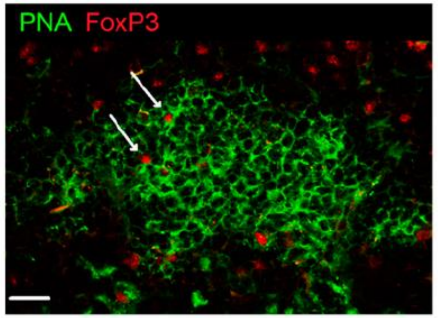
The Graca Lab

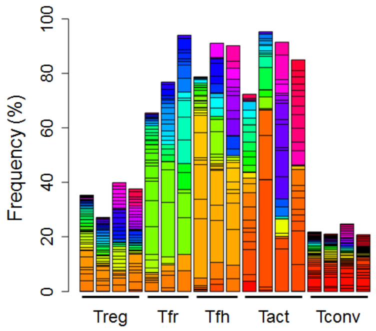
Clinical collaborators



Deng… Graca (2019), *Nature Rev Rheumat*
Romão… Graca (2018), *Arthritis & Rheumatol*
Fonseca… Graca (2018), *Arthritis & Rheumatol*
Fonseca… Graca (2017), *Science Immunol*

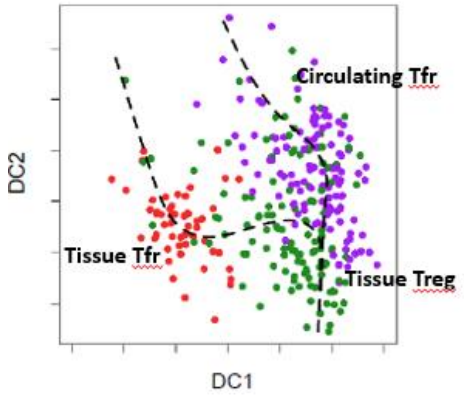
Immunologists: Biology of Tfh/Tfr cells and GC





Kumar… Graca (2024), *Cell Discov*
Graca (2023), *Science Immunol*
Fonseca… Graca (2019), *Immunol Rev*
Maceiras… Graca (2017), *Nature Commun*

Mathematics/Modeling/Bioinformatics



Malato… Graca (2023), *Lancet Inf Dis*
Graca (2023), *Nature Immunol*
Malato… Graca (2022), *N Eng J Med*
Kumar… Graca (2021), *Science Immunol*

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