

Reporting Summary

Nature Portfolio wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Portfolio policies, see our [Editorial Policies](#) and the [Editorial Policy Checklist](#).

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a	Confirmed
<input type="checkbox"/>	<input checked="" type="checkbox"/> The exact sample size (<i>n</i>) for each experimental group/condition, given as a discrete number and unit of measurement
<input type="checkbox"/>	<input checked="" type="checkbox"/> A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
<input type="checkbox"/>	<input checked="" type="checkbox"/> The statistical test(s) used AND whether they are one- or two-sided <i>Only common tests should be described solely by name; describe more complex techniques in the Methods section.</i>
<input type="checkbox"/>	<input checked="" type="checkbox"/> A description of all covariates tested
<input type="checkbox"/>	<input checked="" type="checkbox"/> A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons
<input type="checkbox"/>	<input checked="" type="checkbox"/> A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals)
<input type="checkbox"/>	<input checked="" type="checkbox"/> For null hypothesis testing, the test statistic (e.g. <i>F</i> , <i>t</i> , <i>r</i>) with confidence intervals, effect sizes, degrees of freedom and <i>P</i> value noted <i>Give P values as exact values whenever suitable.</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/> For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
<input checked="" type="checkbox"/>	<input type="checkbox"/> For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes
<input type="checkbox"/>	<input checked="" type="checkbox"/> Estimates of effect sizes (e.g. Cohen's <i>d</i> , Pearson's <i>r</i>), indicating how they were calculated

Our web collection on [statistics for biologists](#) contains articles on many of the points above.

Software and code

Policy information about [availability of computer code](#)

Data collection	Data collection was conducted with the open source Kobo Toolbox data collection tool (www.kobotoolbox.org)
Data analysis	Analyses and data visualization were performed using the R statistical programming language (R version 4.1.3, 2022-03-10), with visreg and ggplot2 for data visualization.

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Portfolio [guidelines for submitting code & software](#) for further information.

Data

Policy information about [availability of data](#)

All manuscripts must include a [data availability statement](#). This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A description of any restrictions on data availability
- For clinical datasets or third party data, please ensure that the statement adheres to our [policy](#)

Detailed questionnaire data and calculated variables, including self-reported demographics, comorbid medical conditions, occupational information, and vaccine status have been stored securely and are available from the authors upon reasonable request, and subject to privacy and ethical restrictions.

National and provincial demographic data, cluster population and classification, SARS-CoV-2 cases and deaths data, and COVID-19 vaccination data were obtained from Dominican Republic National Statistics Office, United Nations Statistics Division, and the COVID-19 GitHub repository. These datasets are publicly accessible and can be obtained from the respective sources.

For clinical datasets utilized in this study, we confirm that this data was anonymized or aggregated as appropriate, and used in accordance with ethical standards and under appropriate permissions and requirements. Written consent was obtained for all participants, and ethical approval was secured from relevant institutions as described.

Please note that certain data underpinning this study are not publicly available due to privacy or ethical restrictions, but are available from the authors upon reasonable request and with permission of relevant third party entities.

This study was carried out in compliance with Nature Medicine's data availability policy. Every effort has been made to provide unrestricted access to all raw and processed data that support our findings, while adhering to privacy considerations, ethical approvals, and applicable laws and regulations.

Research involving human participants, their data, or biological material

Policy information about studies with [human participants or human data](#). See also policy information about [sex, gender \(identity/presentation\), and sexual orientation](#) and [race, ethnicity and racism](#).

Reporting on sex and gender	Our study reported on the self-reported sex of study participants.
Reporting on race, ethnicity, or other socially relevant groupings	We did not report on race or ethnicity in this study.
Population characteristics	Details of population characteristics are reported in Table S1. Demographic and clinical characteristics of study participants.
Recruitment	Participants were recruited through a national multistage serological survey, described in detail at the following link: https://doi.org/10.1016/j.lana.2022.100390 .
Ethics oversight	Written consent was obtained for all participants. For children <18 years old, except emancipated minors, consent was obtained from the legal guardian. Written assent was provided by adolescents 14-17 years old, and verbal assent by children 7-13 years old. The study protocol was approved by the National Council of Bioethics in Health, Santo Domingo (013-2019, 007-2021), the Institutional Review Board of Pedro Henríquez Ureña National University, Santo Domingo, and the Mass General Brigham Human Research Committee, Boston, USA (2019P000094, 2021P001294). Study procedures and reporting adhered to STROBE criteria for observational studies.

Note that full information on the approval of the study protocol must also be provided in the manuscript.

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

☒ Life sciences ☐ Behavioural & social sciences ☐ Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see [nature.com/documents/nr-reporting-summary-flat.pdf](https://www.nature.com/documents/nr-reporting-summary-flat.pdf)

Life sciences study design

All studies must disclose on these points even when the disclosure is negative.

Sample size	Sample size was calculated for the national survey, but not for the sub-population used for this study. The study population selected for the cohort study were based on proximity to existing study infrastructure.
Data exclusions	There were no data exclusions.
Replication	Validation of models was performed using three discrete approaches as described in the main text.
Randomization	No randomization was performed.
Blinding	No blinding was performed.

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

- | | |
|-------------------------------------|--|
| n/a | Involved in the study |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> Antibodies |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> Eukaryotic cell lines |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> Palaeontology and archaeology |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> Animals and other organisms |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> Clinical data |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> Dual use research of concern |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> Plants |

Methods

- | | |
|-------------------------------------|---|
| n/a | Involved in the study |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> ChIP-seq |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> Flow cytometry |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> MRI-based neuroimaging |