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Supplementary information

The R&D landscape for infectious disease vaccines

In the format provided by the authors

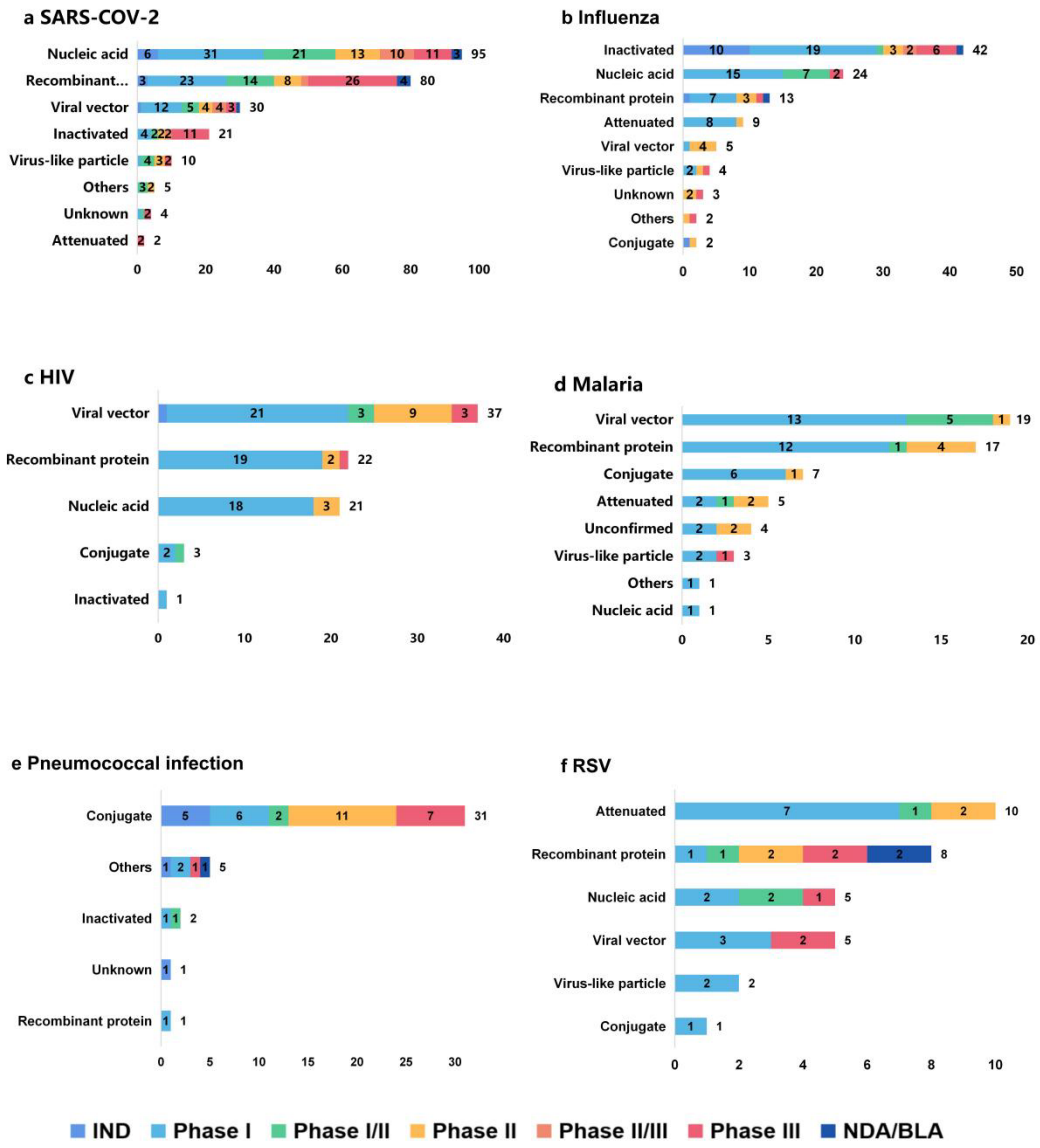
Data and analysis

Data on pipelines of prophylactic vaccine candidates for infectious diseases globally were collected from the Pharmcube database, curated from authoritative platforms of drug and clinical trials information and literature databases, including the US National Institutes of Health (NIH)-funded Clinical Trial Registry (https://clinicaltrials.gov/), the Chinese NMPA's Registration and Information Disclosure Platform for Drug Clinical Studies (https://www.chinadrugtrials.org.cn), the Chinese Clinical Trial Register (ChiCTR, https://chictr.org.cn), the European Clinical Trials Registry (EudraCT, https://eudract.ema.europa.eu) the Japanese Clinical Trials Registry (Japic CTI, https://jrct.niph.go.jp), the World Health Organization's International Clinical Trials Registry Platform (WHO ICTRP), PubMed (https://pubmed.ncbi.nlm.nih.gov), Web of Science (https://www.webofscience.com) and other sources, including scientific conferences, company press releases, published reports, and investor presentations.

Vaccines were included in our analysis with the following eligibility criteria: 1) vaccines with potential for the prevention of infectious diseases in healthy (seronegative) individuals; 2) vaccines that had entered into clinical development in any country and 3) vaccines that had not yet received marketing authorization at the cut-off point of 1 January 2023. We excluded vaccines that have been explicitly discontinued or did not have any updated R&D progress for the most recent three years or longer. A total of 966 candidates were included in this analysis. Data were manually verified and further categorized with parameters of technology platform, developer, development stage, indications and location of origin.

In terms of technology platform, all investigational vaccine candidates were classified as recombinant protein, nucleic acid, inactivated, viral vector, conjugate, attenuated, virus-like particle, toxoid vaccines, others (for agents which cannot be classified into the above categories, such as live vaccine, DC vaccine, bacterial vector vaccine, etc) or in the unknown group (for agents which were unamenable to classification owing to lack of adequate information).

In Figure 2a, the location of origin was determined by the location of the developer (for multinational enterprises or organizations, the information was the locations of their headquarters). For projects with partnerships, all countries where the developers were located were accounted for and included in the totals. For the classification of the developers shown in Figure 2b, candidates were divided into 'Private/industry' (for projects only involving listed or non-listed pharmaceutical companies), 'Academic/non-profit' (for projects only involving universities, institutions, public welfare organizations or government agencies), 'Cooperation' (for projects involving both of them) and 'Unknown' (for agents without adequate information for classification).



Supplementary Figure 1 | Profile of the top six diseases by technical platform and R&D phase. Distribution of technical platforms and R&D phase for vaccine candidates against the top six diseases in the pipeline are shown in the stacked bar charts.