

COVID-19 FUNDED RESEARCH PROJECTS IN FOCUS



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Key Findings:

Number of capacity strengthening projects:

78

Funding investments (known funding amounts):

\$34.75m

Top funder:

CIHR

New variants

To date, the world has seen nearly 600 million known cases of COVID-19 and the pandemic has claimed over six million lives [1]. All viruses, including SARS-CoV-2 (which causes COVID-19), evolve over time. Some of these changes affect the properties of a virus, including how easily it spreads, the severity of disease, effectiveness of vaccines, therapeutics and diagnostic tools, and other public health/social measures [2]. The evolution of SARS-CoV-2 was monitored by experts as of January 2020, and later in the year specific Variants of Interest (VOIs) and Variants of Concern (VOCs) were characterised, as the emergence of variants posed an increased risk to public health worldwide. Identified VOCs include: Alpha, Beta, Gamma, Delta and Omicron (the latter two are still circulating VOCs as categorised by WHO) [2]. Here, we present the scope of funded research activity focused on identified or potential variants of COVID-19, drawing on evidence from the July 2022 update of the Living Mapping Review (LMR) of COVID-19 funded research projects and the UKCDR/GLOPID-R [COVID-19 Research Project Tracker](#).

Methodology

Descriptive and thematic analyses were done as outlined in the [LMR study protocol](#). Projects with some degree of focus on “new variants” of COVID-19 were identified and coded as such. The identified projects include those investigating factors such as adaptive immunity, identification of variants from genomic sequencing, related consequences of variation, including implications for vaccine effectiveness, and how to respond to variants of concern for COVID-19. As part of the analysis the following were determined: key funders; funding amounts; country distribution of projects; specific research focus; and study populations.

Findings

Locations, funders and funding amounts

The 78 projects that were identified as having an identifiable focus on new variants of COVID-19 were funded by 25 funders with an investment of at least \$34.75 million. Canadian Institutes of Health Research (CIHR) funded the most projects (28) followed by the National Institute for Health (NIH) (11) and the Department of Science and Innovation in South Africa (6). More detail can be seen in Table 1. These funders were also among the top funders in terms of known funding amounts; CIHR invested nearly \$18m in projects that investigated new variants, NIH invested \$6.6m and UKRI (despite only investing in one project) invested \$3.5m (see Figure 1).

Table 1: Research funders investing in COVID-19 variants

Funder	No. of projects
CIHR	28
NIH	11
Department of Science and Innovation - South Africa	6
South African Medical Research Council	5
Agence nationale de la recherche (ANR)	3
Genome British Columbia	3
Michael Smith Foundation	3
RIKEN	2
PRACE	2
Vingroup	2
Luxembourg National Research Fund	2

Funders with 1 project each: FAPESP; UKRI; SNSF; FAPEG; NSF (USA); Johns Hopkins University; Fundacion Mutua Madrilenia (Spain); University of Colorado; DFG; European Commission; Danish Independent Research Foundation; C3. ai DTI; NHMRC; ICGEB

Figure 1: Research funders investing in COVID-19 variants research (amount invested (USD))

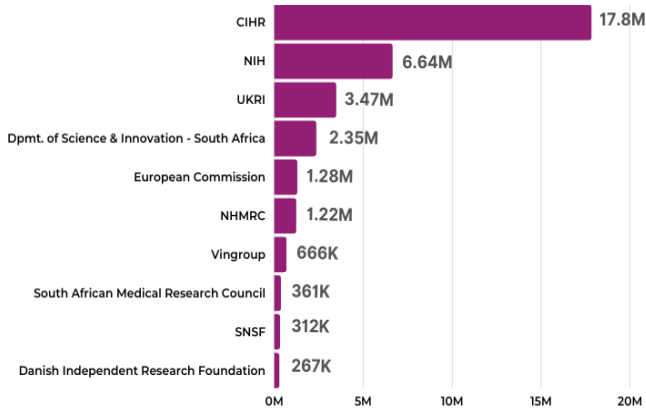
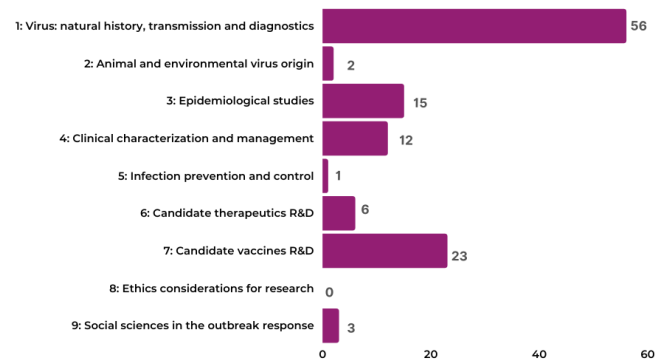


Figure 3: COVID-19 variants research projects categorised by WHO research priority areas



Research involved at least one of 17 countries including only one least-developed country (Rwanda). 19 of the projects involved at least one low- or middle-income country (LMIC), whereas 61 took place in at least one high-income country (HIC) as shown in Figure 2. Due to the funding of CIHR, it is not surprising that Canada ranked highest, being included in 31 projects. The next highest were USA (15) and South Africa (11).

Research focus and WHO research priorities

The projects identified under the “new variants” area of interest were categorised against the WHO Research Roadmap priorities and sub-priorities. The majority of projects were coded against the priority area of ‘Virus: natural history, transmission and diagnostics’ (56 projects, representing 72% of all projects in this analysis). This would be expected due to the nature of the topic, which concerns knowledge about the virus and how it adapts, and the implications for vaccines and therapeutics. Nearly 30 percent were categorised as ‘Candidate vaccines research and development’ (23). The next highest were ‘Epidemiological studies’ and ‘Clinical characterization and management’ (though both were relatively low numbers of 15 and 12 projects respectively) (see Figure 3).

When analysing the projects further, the sub-priority areas of most interest were:

- 1c: Development of tools and conduct studies to monitor phenotypic change and potential adaptation (32);
- 1d: Characterization of immunity (21); and
- 1b: Understanding virus compartments, shedding and natural history of disease (13) (see footnote for further details).

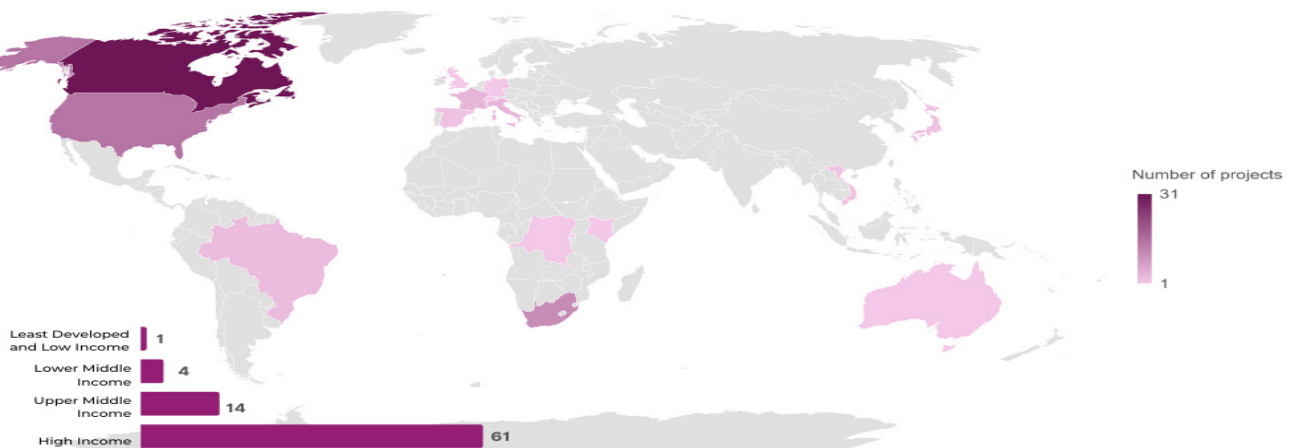
Study populations

33 projects coded against the area of ‘new variants’ were conducted with the human population. Of those involving human subjects, the focus was the virus’s natural history, transmission and diagnostics (20 projects) and/or vaccines research and development (15 projects).

27 projects coded against the area of ‘new variants’ studied the virus itself (25 the virus’s natural history, transmission and diagnostics, and 7 vaccines).

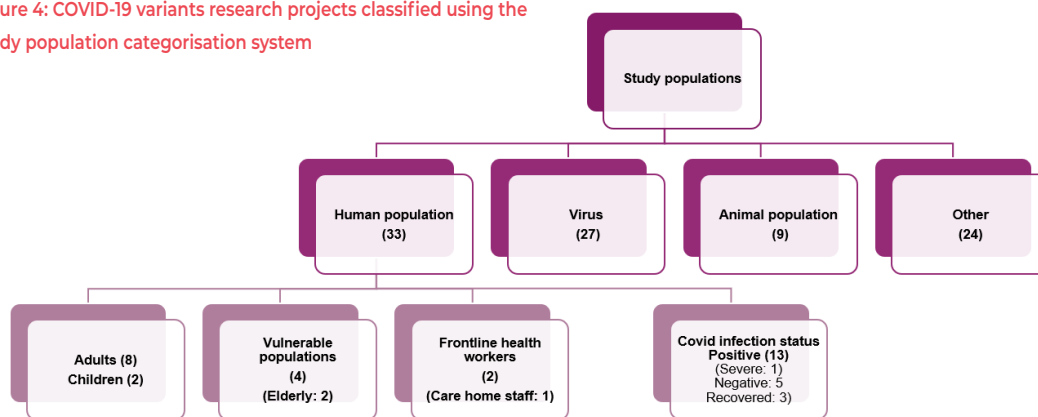
Only nine studies specified work with the animal population, which focused on factors including transmission, pathogenesis, immune escape and implications for vaccines. (Figure 4 shows more details on this).

Figure 2: Locations of projects investigating COVID-19 variants



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Figure 4: COVID-19 variants research projects classified using the study population categorisation system



Discussion and conclusion

This tracker highlight is the first iteration focusing on new variants and joins UKCDR’s suite of tracker highlights. The number of known projects investigating new variants is relatively low compared to other areas of interest, however it is likely that much of this research may be being undertaken within existing COVID-19 funded projects. As more data is acquired from funders and coded as part of the team’s coding process, more projects are expected to be recognised as being in this area.

Despite the relatively small sample set, it is still important to highlight that research projects in this area were concentrated in high-income countries and upper-middle income countries. Only five projects took place in a lower-middle or low-income country. This is an important gap to highlight, as it is people in the world’s poorest countries who continue to be most affected by COVID-19 [3] and several variants of COVID-19 were identified in lower- and middle-

income countries first, including Delta (India), Omicron and Beta (South Africa), and Gamma (Brazil) [2, 5].

The world’s poorest countries are the least likely to have good vaccination coverage, which means they are more vulnerable to severe illness and variations of the virus. Scientists have warned this in the past [6], yet vaccine coverage remains an issue. In March 2022, WHO’s Director-General highlighted that one third of the world’s population is yet to receive a single dose of a COVID-19 vaccination (including 83 percent of Africa’s population), whereas some high-income countries are now providing fourth doses to people [7, 8]. If vaccination coverage stays so unequal, it will be of high importance to develop and build the research body investigating COVID-19 variants to include more of these low-income countries.

As new variants continue to be a problem at a global scale, it will be important for further research to be undertaken in this field. This will be investigated in future iterations of the LMR and related tracker highlights.

About the UKCDR/ GloPID-R Tracker

The UKCDR/GLOPID-R COVID-19 Research Project Tracker (the Tracker) is a live open access database which categorises COVID-19 research activity funded around the world against the WHO research priorities outlined in the WHO Coordinated Research Roadmap. COVID CIRCLE has initiated a Living Mapping Review of these projects, published in Wellcome Open Research, to support funders and researchers in the achievement of a coherent response to this pandemic.

For more on the Tracker and our work on COVID-19, visit: ukcdr.org.uk/covid-circle

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Footnote

1c: Develop tools and conduct studies to monitor phenotypic change and potential adaptation (32 projects); 1d: Characterize immunity (naturally acquired, population and vaccine-induced, including mucosal immunity) (21); 1b: Understand virus compartments, shedding and natural history of disease (13); 4b: Understand pathophysiology of COVID-19 infection (11); 3a: Transmission dynamics (9); 7a: Identification of vaccine candidates (9); 1a: Support development of diagnostic products to improve clinical processes (8); 6a: Develop in vitro and in vivo testing to identify therapeutic candidates (4); 2a: Investigation of animal source and route of transmission (2); 3b: Disease severity (groups at high risk of severe infection and role of age groups in transmission) (2); 4d: Improve processes of care (early diagnosis, discharge criteria and interventions that improve the clinical outcome of infected patients) (2); 6d: Evaluate efficacy and safety of therapeutics through randomised clinical trials (2); 1e: Develop disease models (1); 1f: Virus stability in the environment (1); 3d: Control and mitigation measures (1); 5d: Factors and methods influencing compliance with evidence-based IPC interventions during outbreak response (1); 9c: Media and communication (making sense of COVID-19, addressing fear, anxieties and stigma, improving public knowledge and trust) (1)

Notes

Limitations of data and findings: Study protocol is outlined in Living Mapping Review of COVID-19 funded research projects. Analysis was limited by:

- o A lack of completeness of funding and/or qualitative data for some projects.
- o Tracker data is more likely to be derived from UKCDR and/or GloPID-R funders.
- o The absence of commercial research.

References

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