COVID-19 FUNDED RESEARCH PROJECTS IN FOCUS:

Long COVID

Issue date

January 2023

Key findings:

Number of projects:

240

Funding investments (known funding amounts):

$281.8m

Top funder:

NIH & UKRI

Long COVID

As the coronavirus pandemic evolves, there is increased interest in the emerging phenomenon, now commonly referred to as “long COVID”, which encompasses a wide spectrum of persistent and newly emerging multisystemic symptoms following COVID-19 infection. These include cough, fatigue, shortness of breath, alterations in taste and smell, depression, and mood disturbances (1). Cardiac, pulmonary, and renal sequalae may also follow COVID-19 infections. To date, there is a lack of consensus on a clear definition, diagnosis, clinical characterization and management, rehabilitation, and appropriate support for sufferers in addition to difficulties in ascertaining its prevalence (1) (2) (3). Here, we present the scope of funded research activity focusing on various aspects of long COVID, based on evidence from the 21-month 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 analysis were conducted as outlined in the LMR study protocol. Projects addressing long COVID were identified and key funders, funding amounts, country distribution of projects, specific research focus and study populations targeted were determined. Projects were also mapped to the long COVID priorities identified in the GloPID-R/ISARIC long COVID meetings held in December 2020.

Findings

Locations, funders, and funding amounts

Two hundred and forty long COVID research projects, representing a research funding investment of at least $281.8 million, were identified. The total funding amount identified is underestimated as funding amounts were available for only about 65% of projects. Of the 69 funders that have funded long COVID research, NIH has funded the highest amount ($151.3m) and UKRI has funded the highest number of projects (34) as shown in Figure 1. Figure 2 shows research projects involved in at least one of 48 countries, although one large CIHR-funded project alone took place across 27 countries. Ten other projects involved at least two countries. These projects are largely concentrated in Europe (41.7%) and North America (50.0%).

Figure 1: Top 10 funders of long COVID research by no. of projects on tracker (known value of projects indicated in brackets)

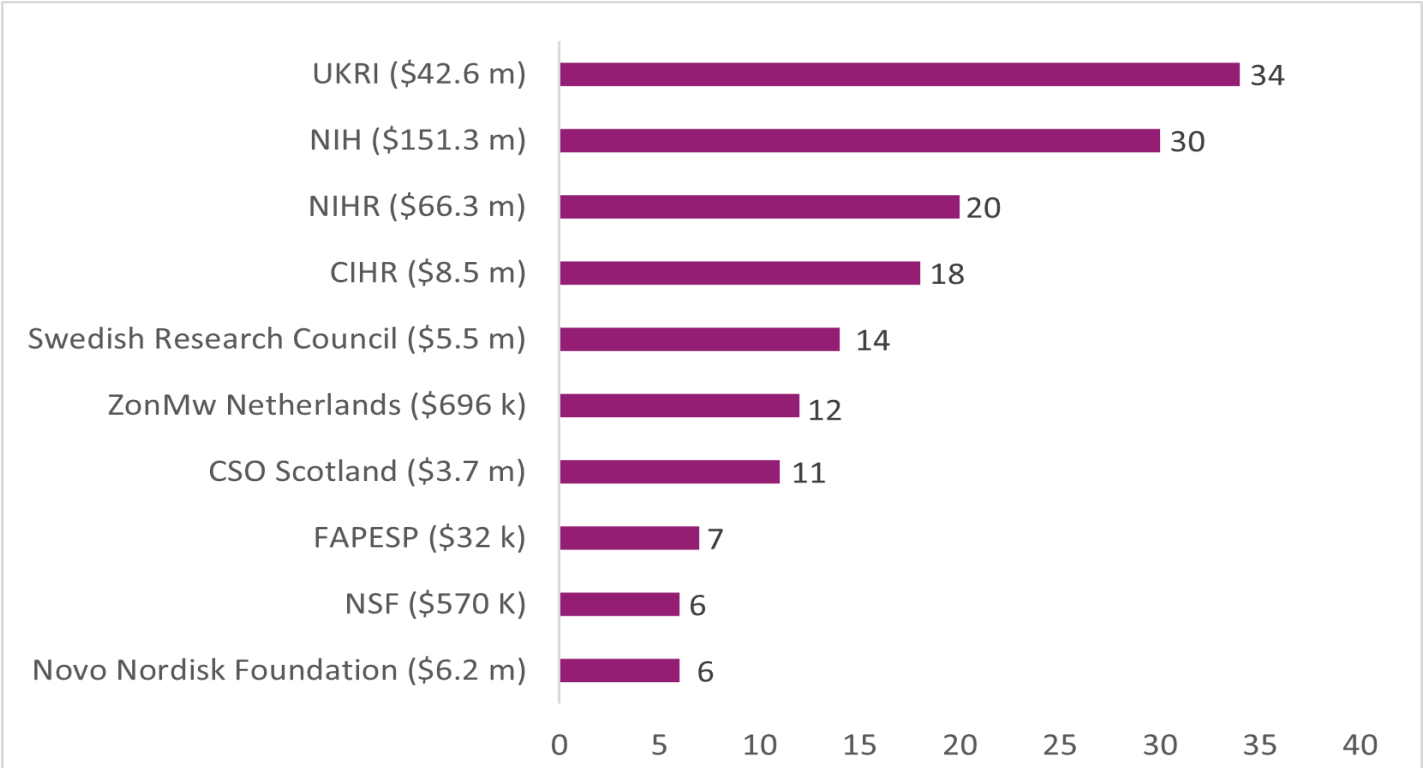
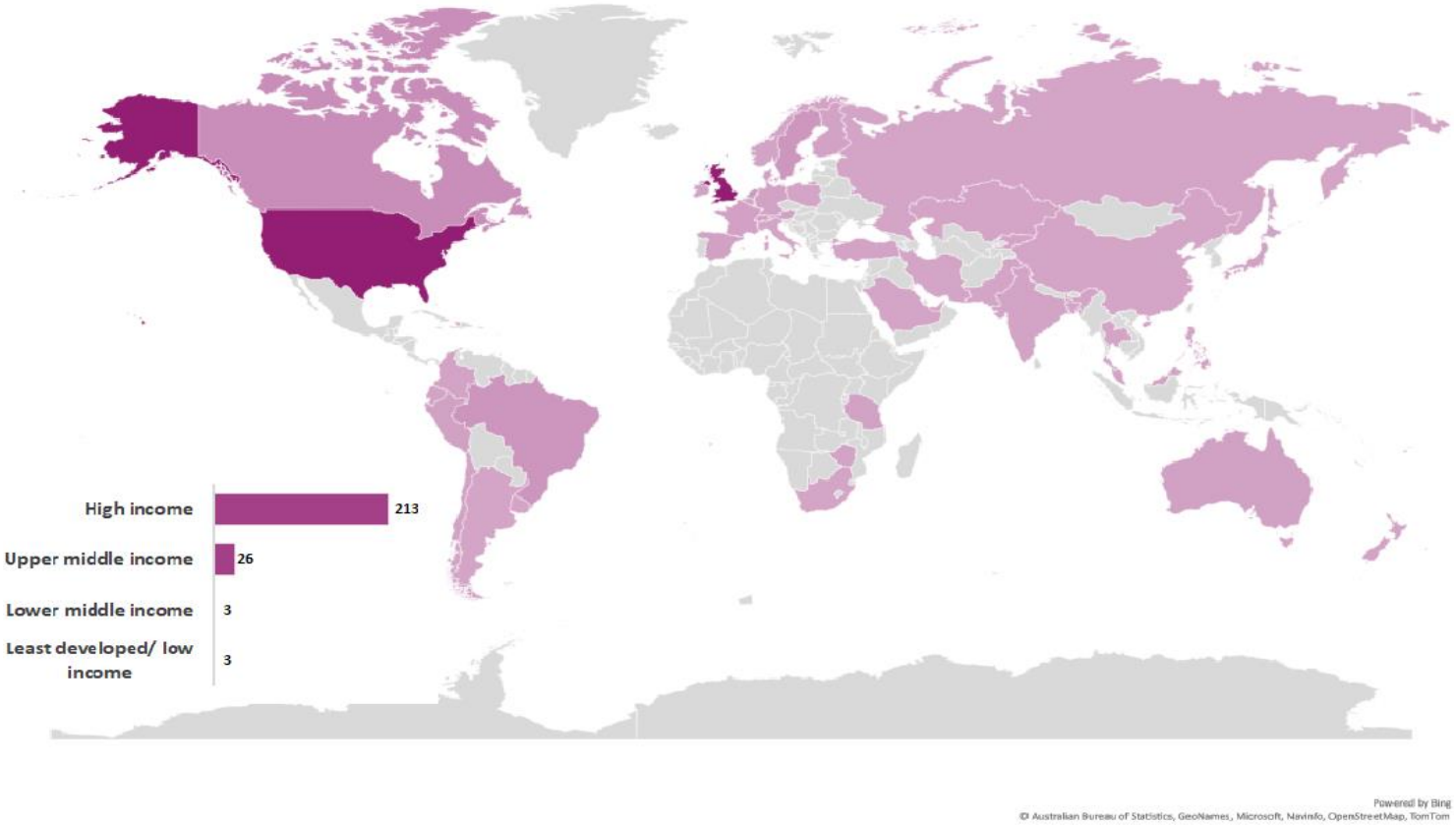


Figure 2: Locations of projects investigating long COVID research



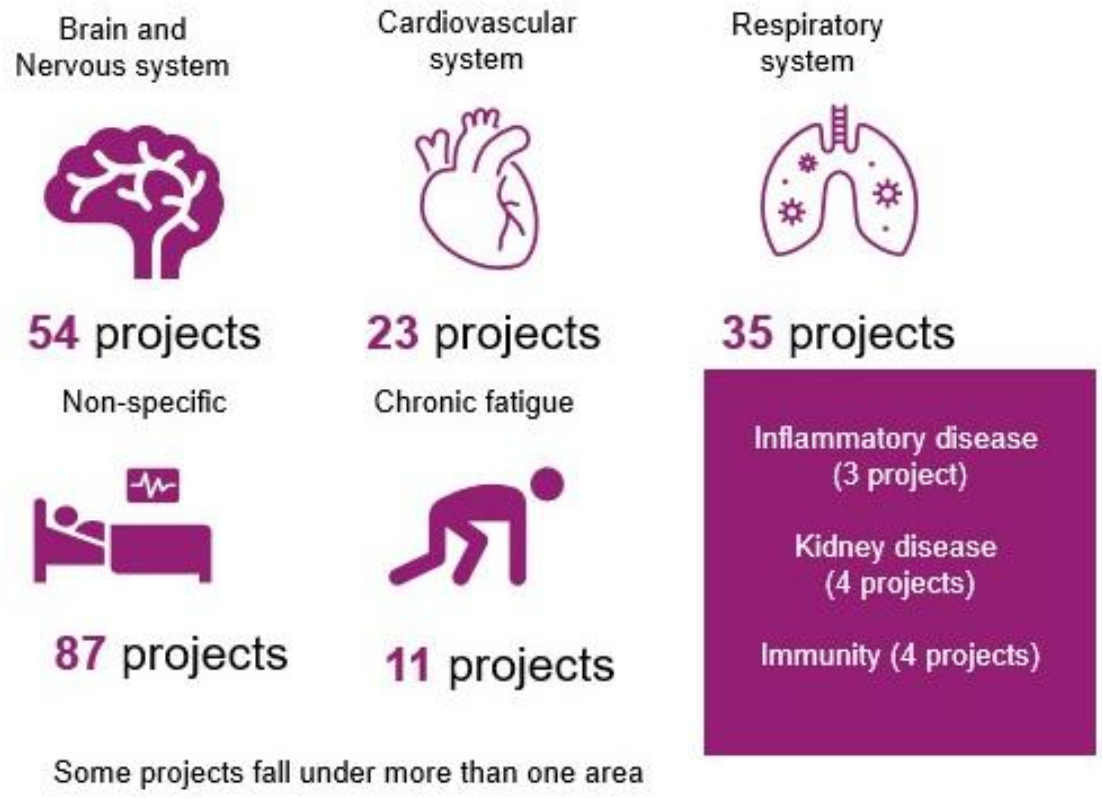
Research focus, WHO Research priorities and long COVID research priorities (identified at the ISARIC & GLoPID-R long COVID forum)

More than one third of the projects (36%) focused on determining the spectrum of long COVID symptoms. Where specified, most projects assess brain and nervous system sequelae following COVID-19 infections and several studies focused on understanding the pathogenesis and risk factors for long COVID, as seen in Figure 3 and Table 1 respectively.

Table 1: Research focus of long COVID projects

Research focus	**No. of projects**
Spectrum of long-term symptoms	87
Pathogenesis	64
Management	50
Risk factors	34
Prevalence	21
Diagnosis	12
Prevention	4
Social Determinants	2

Figure 3: Organ / System of research focus



Interestingly, long COVID was not identified at the time the WHO Roadmap priorities were being set and this theme emerged out of the LMR analyses, predominantly within the "clinical characterization and management" priority area. However, long COVID projects now cut across most of the WHO priorities except for the "ethical considerations for research" priority area.

Mapping the long COVID research against the WHO research priorities in Table 2 shows most projects investigate the pathogenesis of long COVID, followed by studies on improving the clinical care processes and identifying long COVID severity by population group. No projects assess the impact of vaccination on long COVID, and several studies focused on understanding virus characterization and epidemiology of long COVID. In addition, when the long COVID projects are mapped to the UN research roadmap for the Covid-19 recovery pillars, only 6.3% (15 projects) are included. Nine of these projects are relevant to the pillar of health systems & services and seven are to the pillar of social protection and basic services.

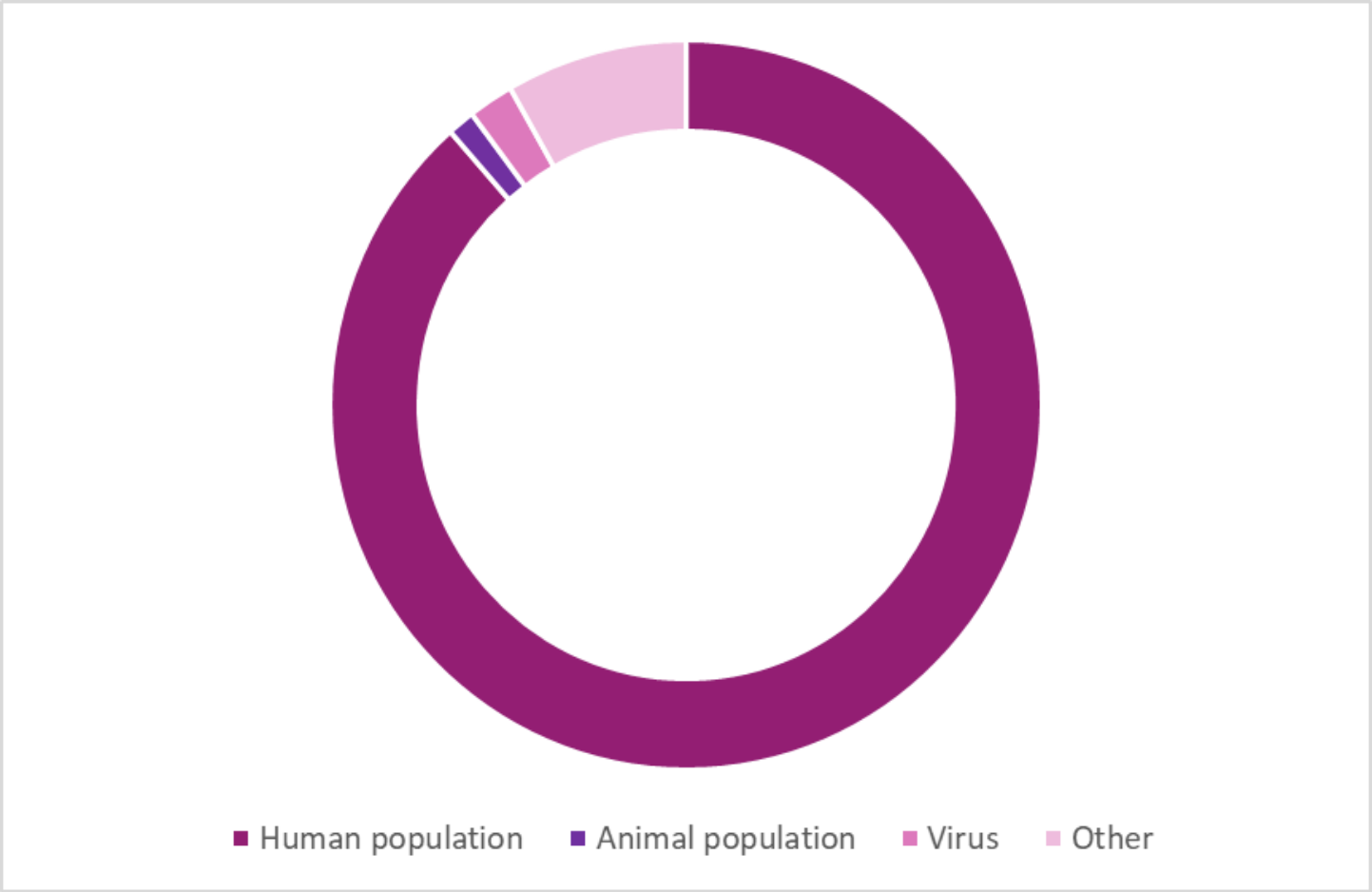
Table 2: Projects mapped to the long COVID research priorities identified at the ISARIC & GLoPID-R long COVID forum

WHO priority area	Long COVID sub-priorities	Number of projects
1	Characterize host immunity levels	23
	Virus characterisation and natural history	8
	Development of diagnostic products	1
3	Disease severity within population groups	14
	Transmission dynamics (pre-symptomatic/asymptomatic)	11
	Susceptibility and infectivity of children to COVID-19	2
4	Pathogenesis of COVID-19	139
	Improve processes of covid patient clinical care	72
	Prognostic factors for severe disease by population group	35
6	Invitro and in vivo testing to identify drug candidates	8
	Evaluate efficacy and safety of therapeutics by RCTs	2
	Investigate combination therapies	1
	Evaluate efficacy and safety of prophylactic use	1
7	Candidate vaccines	1
9	Public Health approaches for COVID-19 prevention and control measures	4
	Approaches for rapid and participatory engagement in pandemic response	1
	Media and communication for COVID-19 information dissemination	1
	Clinical care and health system for people providing care for COVID-19 patients	1

Study Populations

Almost 90% of projects (215 projects) involve human subjects with several studies planned for recovered and infected patients. Both symptomatic and asymptomatic, hospitalised patients and community populations were included in research projects. Although many projects provided non-specific study population details (Figure 4), more than half of the projects (51.7%) involved people recovered from COVID-19.

Figure 4: Study populations involved in long COVID research projects



Three projects investigate long COVID pathogenesis in animals whilst others focused on digital innovations for the management of long COVID. 41 projects are carried out in newly created or existing research cohorts pivoted for COVID-19 research and many of these investigated community cases of long COVID. Few projects involved children (ten projects) and the elderly (13 projects) whilst few projects involved other vulnerable populations and frontline workers.

Discussion and conclusion

As the COVID-19 pandemic evolves, researchers and funders are adapting research priority areas to emergent needs, highlighted by the expanding spectrum of research activity to further understand long COVID. Several studies seek to identify risk factors and understand the pathogenesis of long-term sequelae to prevent these aftereffects or minimise their severity.

Identifying the scope of long COVID symptoms will enable a comprehensive definition, diagnosis, and development of treatment protocols. More research projects involving individuals from LMICs is needed. We expect more research activity to address the remaining research gaps as the pandemic evolves.

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

Get in touch

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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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