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Monitoring investments in coronavirus research and development

Research and development is a crucial part of responding to and preparing for disease outbreaks.¹ However, funding for research and development has historically been reactive, with little proactive investment in the periods between pandemics. Through the Research Investments in Global Health (RESIN) study, we have shown the reactive nature of funding, for example, with Ebola virus disease, Zika virus disease, and severe acute respiratory syndrome (SARS), where investment follows disease outbreaks.^{2,3}

The need for a proactive approach has been acknowledged with the publication of a research and development roadmap by WHO,⁴ and with the setup of the Coalition for Epidemic Preparedness Innovations (CEPI)—a substantial infrastructure for product development research into emerging infectious diseases, including coronaviruses.⁵ However, considering the COVID-19 outbreak, the world is clearly not prepared for a pandemic.

The ability to track research and development has the potential to provide an evidence base to support research prioritisation and understand current research capabilities and capacity. But with data disaggregated in multiple funding bodies and

organisations, a coordinated response to research and development during disease outbreaks poses a challenge.

Considering this challenge, we at the RESIN study have developed a Coronavirus Research and Development Dashboard, describing historical and current funding trends with continuous updates across the COVID-19 pandemic. This is part of a larger study describing US\$105 billion of research investment for all infectious diseases.²

Between January, 2000 and December, 2019 (appendix p 1), there were 445 awards covering US\$533 million of investment by public and philanthropic research and development funders. \$359 million (67.4%) was related to SARS, and the year of greatest funding was 2004 (\$158 million [29.6%]), immediately post-SARS. Preclinical research accounted for \$509 million (95.5%).

As of April 27, 2020, we have detected 221 additional research awards funded and related to coronavirus (appendix p 1), with a sum investment of \$421 million. Most of this investment was related to vaccine and product development research for COVID-19 by CEPI (estimated at \$250 million). Therefore, out of a total \$954 million for coronavirus research between January, 2000, and April, 2020, \$414 million (43.4%) was related to COVID-19, with further rapid funding continuing to be awarded. Of the 2020 data, only \$7.5 million (1.8%) of \$421.3 million funding related to

coronavirus was not specifically related to COVID-19.

It is essential that the global health community addresses the clear gaps in knowledge during the COVID-19 pandemic. Continuous efforts to track research and development investments can support decision making around efficient allocation of research resources that are scarce, and can provide transparency and coordination around global efforts to address the COVID-19 pandemic.

We declare no competing interests.

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For more on the **Coronavirus Research and Development Dashboard** see <https://www.the-ciru.com/resin-covid19>

See Online for appendix