In 2015, scientists at the Federal University of Pernambuco in Recife were the first to link a rise in the incidence of newborns displaying an abnormally small head and resultant brain damage (microcephaly) with an outbreak of Zika, transmitted to their mothers by mosquitoes.

A study conducted by FAPESP found that, as of April 2018, Brazil was second only to the USA for the volume of scientific publications on Zika, accounting for 15% of the total (Figure 8.5). In the first and third positions were two Brazilian institutions with a tradition for research on tropical diseases, the Oswaldo Cruz Foundation (Fiocruz) and University of São Paulo. The US Centre for Disease Control and Prevention had the second-largest tally.

Among publications with 100 or more citations, Brazilian scientists authored 28%, a share that increased to 45% when the subject included microcephaly.

**Vaccine development for Covid-19**

By the end of July 2020, there were already close to 21 000 publications on the topic of Covid-19 in the Web of Science database. Brazilian scientists had authored 584 of those, placing them eleventh worldwide, ahead of countries with strong scientific research systems such as Switzerland, the Netherlands, Japan and the Republic of Korea.

Scientists from the University of São Paulo had authored in 142 publications (42nd place worldwide), ahead of the University of California San Francisco (130) and Cornell University (135) and behind Stanford (156) and Yale Universities (158) in the USA. Fiocruz counted 40 publications.

One joint Brazilian–UK study found that the city of Manaus in the Brazilian Amazon had attained herd immunity, after about 66% of the population was infected with Covid-19 between March and September 2020. The researchers estimated the fatality ratio at 0.28% in a population where only 6% are older than 60 years of age (Buss et al., 2020).

FAPESP has launched calls for research proposals on Covid-19 and, by July 2020, had invested over PPP$ 100 million in new and converted projects, including seven related to vaccine development. One such project is being led by Jorge Kalil at the School of Medicine within the University of São Paulo. The proposed vaccine should be cheap to produce and provide genetically and ethnically diverse populations worldwide with immunity.

The Federal University of São Paulo and Fiocruz are co-ordinating third-phase clinical trials on 5 000 Brazilian volunteers of the vaccine developed jointly by Oxford University in the UK and the British firm AstraZeneca.

The Butantan Institute in São Paulo was doing the same for the Chinese Sinovac vaccine until the government halted the trial in November 2020. Both Fiocruz and the Butantan Institute have a long history of developing and producing vaccines for various diseases.

Source: compiled by authors

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**Figure 8.5: Trends in Brazilian publications on Zika and related microcephaly**

*as of April 2018