Will we ever reach COVID 'herd immunity'? ³/₄ of the population of the Brazilian Amazon capital Manaus has been infected but the coronavirus marches on

In September, a preprint appeared online with the startling results from a study of covid-19 antibodies in blood-bank samples from Manaus, a city of 2m people in the Brazilian Amazon: 66% of residents may have been infected, it said. The paper, which would later appear in Science, estimating an infection rate of 76%, seemed to confirm local rumours that Manaus had reached "herd immunity". In April it was the first Brazilian city to dig mass graves. By June burials were back to pre-pandemic levels.

"Herd immunity played a significant role" in controlling the virus, argued the preprint, entitled "Covid-19 herd immunity in the Brazilian Amazon". One of its authors, Ester Sabino of the University of São Paulo, now regrets the title. "We didn't think there would be a second wave," she says.

There is. On January 15th hospitals in Manaus ran out of oxygen. At least 51 patients died before army jets brought more. People who could bought oxygen to treat relatives at home. A hospital stationed police to turn patients away.

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The reasons for the spike in Manaus are unclear. Perhaps a new variant—identified in 42% of samples collected in December—is more contagious. It could be that existing antibodies offer less protection against the variant, and that some cases are reinfections.

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