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The first wave of the COVID-19 epidemic in Spain was associated with early introductions and fast spread of a dominating genetic variant

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The coronavirus disease 2019 (COVID-19) pandemic has affected the world radically since 2020. Spain was one of the European countries with the highest incidence during the first wave. As a part of a consortium to monitor and study the evolution of the epidemic, we sequenced 2,170 samples, diagnosed mostly before lockdown measures. Here, we identified at least 500 introductions from multiple international sources and documented the early rise of two dominant Spanish epidemic clades (SECs), probably amplified by superspreading events. Both SECs were related closely to the initial Asian variants of SARS-CoV-2 and spread widely across Spain. We inferred a substantial reduction in the effective reproductive number of both SECs due to public-health interventions ($R_e < 1$), also reflected in the replacement of SECs by a new variant over the summer of 2020. In summary, we reveal a notable difference in the initial genetic makeup of SARS-CoV-2 in Spain compared with other European countries and show evidence to support the effectiveness of lockdown measures in controlling virus spread, even for the most successful genetic variants.

The new coronavirus disease 2019 (COVID-19) caused by SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) emerged in China in October–November 2019 (ref. [1]) and by the end of March 2020 it was present in most countries of the world. The World Health Organization (WHO) declared the new disease as a pandemic on 11 March 2020. Spain suffered a severe epidemic, with the first case reported on 29 January 2020 (ref. [2]), and an accumulated number of 249,659 cases by 1 July 2020, including 28,363 fatalities[3]. Furthermore, a nationwide seroprevalence study showed that only one in ten cases of infection by SARS-CoV-2 were diagnosed and reported in that period[4], suggesting that the total number of infections has been vastly underestimated. Spain ordered a series of nonpharmaceutical intervention measures, including a general lockdown on 14 March 2020 (ref. [5]), later applied by many

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