

# A countrywide study in Portugal addressing antibiotic prescription during the Covid-19 pandemic

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**Background** Antibiotics are among the most commonly prescribed drugs worldwide. However, when improperly or unnecessarily used, these medicines frequently give rise to antibiotic resistance, one of the major global Public Health threats. The mandatory home confinement implemented during the Covid-19 pandemic has caused a suspension on healthcare-associated procedures, such as doctor appointments and non-urgent surgeries.

**Purpose** The major purposes of this study are to: 1) evaluate the antibiotic prescription trends in Portugal considering the number of doctor appointments in both primary and hospital care sectors, and 2) assess the impact of the State of Emergency declaration and resulting stringent governmental measures implemented during the Covid-19 pandemic on the above-mentioned prescription tendencies.

**Method** Antibiotic prescription data, as monthly Defined Daily Doses prescribed by public health sector physicians, were acquired from the System of Information and Monitoring of the Portuguese National Health System (SIM@SNS) public-access platform, between January 2018 and July 2020. The number of doctor appointments within the public health sector was obtained from the Transparência - SNS database. An interrupted time series analysis model based on a segmented regression approach assessed the differences between antibiotic monthly prescribed DDDs per se and per doctor appointment in primary and hospital care.

**Findings** Antibiotic prescription tendency analysis revealed a similar trend throughout 2018 and 2019, with January being the month with the highest level of DDDs prescribed, followed by a decrease until August, and a rise till December. However, in 2020 a significant ( $p < 0.05$ ) fall was observed in antibiotic prescription following Covid-19 emergence in primary ( $B = -420054,797$ ) and hospital ( $B = -627719,984$ ) care settings. Moreover, antibiotic prescriptions by doctor appointment demonstrated a sudden decline between March and June 2020 for primary care and between February and May 2020 for hospital care. The immediate impact prompted by the Covid-19 pandemic also led to a reduction in antibiotic prescription ratios in both settings, although it was only significant in primary care ( $B = -0.127$ ).

**Conclusion** In accordance with several publicized reports, the outcomes obtained within this study confirmed the great impact of the unprecedented Covid-19 pandemic on antibiotic prescription levels among the Portuguese population after the State of Emergency declaration. The decrease in antibiotic prescriptions uncovered during the referred time may be explained by the home confinement and preventive measures adopted, resulting in a lower incidence of antibiotic-associated infections. This study was funded by the project PTDC/SAU-SER/31678/2017, supported by POCI in its FEDER/FNR component POCI-01-0145-FEDER-031678, and the Foundation for Science and Technology.