



Acute lower respiratory tract infections have mainly become a secondary diagnosis in 2022 in hospitalized COVID-19 cases in Germany

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In 2020 and 2021, 56.2% of hospitalized COVID-19 cases in Germany were categorized with the principal diagnosis of an acute lower respiratory tract infection [1]. In the meantime, however, approximately 95% of the German population have IgG antibodies against the S-antigen [2]. At the same time, the omicron variant of SARS-CoV-2 became dominant with a lower pathogenicity resulting in a reduced risk for intensive care treatment and mechanical ventilation [3]. Both developments may result in a lower burden of acute respiratory tract infection among hospitalized COVID-19 cases. That is why we analyzed the remuneration data of the national health insurances in Germany (January 2020–September 2022) provided by the Institute for the Hospital Remuneration System [4]. Any patient admitted and treated in a hospital irrespective of the duration of stay was regarded as a hospitalized COVID-19 case when the following criteria were fulfilled: a person with a laboratory confirmed detection of SARS-CoV-2 by PCR or antigen test irrespective of the type and presence of symptoms. A COVID-19 pneumonia was assumed whenever the ICD-10 code for another viral pneumonia was found (J12.8) in combination with detection of SARS-CoV-2 (U07.1). Between January and September 2022, 561,802 COVID-19 cases were treated in German hospitals, which is more in comparison to all cases in 2021 ($n = 353,828$) and 2020 ($n = 176,574$). During the same time, the proportion of other viral pneumonia among all hospitalized COVID-19 cases was much lower between January and September 2022 (63,476 of 561,802 cases; 11.3%) compared to 2021 (181,387 of 353,828 cases; 51.3%) and 2020 (85,165 of 176,574 cases; 48.2%). In contrast,

the proportions of acute upper respiratory tract infections (J00–J06) increased slightly from 2.1% (2020) and 1.5% (2021) to 3.4% (2022). All other respiratory tract diseases accounted for 11.0% (2020), 7.6% (2021) and 9.4% (2022) of all COVID-19 cases. The proportion of other principal diagnoses in COVID-19 cases has increased from 2020/2021 until 2022 (Fig. 1). They were in 2022 mainly diseases of the circulatory system (I00–I99) with 12.2% (+6.2%), injury, poisoning and certain other consequences of external causes (S00–T98) with 8.6% (+5.0%), symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00–R99) with 8.2% (+4.5%), diseases of the digestive system (K00–K93) with 5.8% (+3.5%) and neoplasms (C00–D48) with 4.7% (+3.2%). The proportions of these principal diagnoses among COVID-19 cases are now mostly in the range of the commonly treated principal diagnoses in German hospitals (data not shown) irrespective of the diagnosis of COVID-19. This finding suggests that in 2022, COVID-19 is a secondary diagnosis in the majority of hospitalized COVID-19 cases in Germany, and that a relevant proportion of these patients primarily have a mild course of COVID-19 so that other diseases are the principal diagnosis or some patients had a positive PCR test without any respiratory tract symptoms while being treated for other major diseases. The most likely explanation for our finding is the dominance of the SARS-CoV-2 omicron variant in Germany since January 2022 which is associated with a lower pathogenicity [3]. Our finding may have implications for public health measures.

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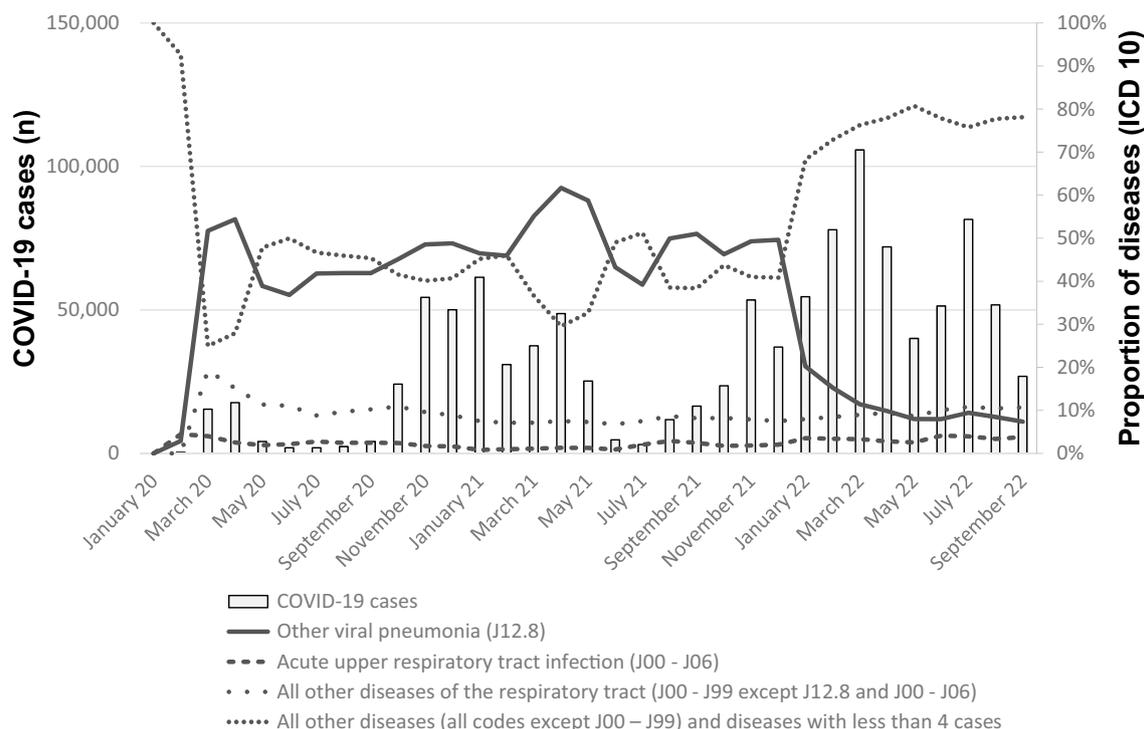


Fig. 1 Overview on the number of hospitalized COVID-19 cases in Germany between January 2020 and September 2022 and their principal diagnoses according to the ICD 10 disease codes. Source: InEK Datenportal. [4]

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Declarations

Conflict of interest The authors have no competing interests to declare with relevance to the manuscript. The views expressed here are those of the authors and do not necessarily reflect those of the university.

Ethical approval Not applicable.

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