Examining the Impact of School Closures on COVID-19 Infections in Europe and their Effects on Different Age Cohorts

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Summary. This paper presents a comprehensive analysis of COVID-19 case trends and the influence of age groups in selected European countries. The study examines the relationship between population size and the total number of confirmed cases, revealing that larger countries tend to have higher case numbers. The impact of different waves on age groups is investigated, with the first wave affecting older age groups and the third wave primarily impacting the youngest age groups. The study also evaluates the effects of school closures on COVID-19 cases using a Generalized Additive Model (GAM). The findings demonstrate a decreasing non-linear effect of school closure across all countries studied. Moreover, the analysis of age groups reveals distinct patterns, with the 0 to 4 age group experiencing a downward trend after school closure, while age groups 5 to 14 exhibit a significant increase in cases. Age groups 15 to 24 show a surge immediately after closure, followed by a decline. Additionally, Transfer Entropy calculations highlight asymmetry in age group influences, indicating that changes in COVID-19 cases in certain age groups predict changes in other age groups but not vice versa. The study also identifies consistent patterns across countries, such as the predictive influence of younger cohorts on older cohorts in Austria, Germany, and the Netherlands. Conversely, Portugal and Spain show a predictive influence of older cohorts on younger cohorts. These findings contribute to a better understanding of COVID-19 dynamics in European countries and provide insights for public health strategies and interventions.

1.   Introduction

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2.   R code

Can be inserted in regular R markdown blocks.

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x <- 1:10
x
```

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##  [1]  1  2  3  4  5  6  7  8  9 10
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