A BAYESIAN FRAMEWORK ASSESSING TEMPORAL TRENDS OF SUICIDALITY AMONG HOSPITALIZED ADOLESCENTS DURING COVID-19 PANDEMIC

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Introduction

Literature on temporal patterns of suicidality during the COVID-19 pandemic among youths is growing. The present work proposes a Bayesian approach to assess the COVID-19 pandemic temporal patterns of suicidality among inpatient adolescents.

Methods

Data referred to the first hospital discharge record with a suicidality-related ICD9-CM code among adolescents aged 13-19 between 1 January 2017 and 31 March 2021 were collected in the Piedmont region, Italy (n=334; median age: 15 years, IQR: 14-16; 80% girls). A Poisson Bayesian regression model performed on pre-COVID-19 data (2017-2020), adjusted by seasonality and stratified by gender, was adopted to provide a posterior predictive probability distribution, namely the distribution of the discharge counts per year quarter from April 2020 to March 2021 implied by the model. Then, using the posterior prediction on the generated model, the predictive posterior p-value (PPP) was assessed, defined as the probability that the observed number of cases in the COVID-19 period was equal to or lower than that expected according to previous years' distribution (or, conversely, the probability that the expected number of cases was higher than that observed in the COVID-19 period). We followed the guideline provided by Bland et al. 2015 to interpret PPP as a measure of evidence against the null hypothesis (equivalence between observed and predicted cases) (Bland, 2015).

Results

Among boys, we consistently obtained PPPs close to 1 throughout the entire 2020, suggesting that the observed phenomenon of suicidality was lower than what was expected. From January to March 2021, there was a high consistency between the expected and observed phenomenon, as indicated by PPP = 0.33. In contrast, among girls, the PPPs, consistent with pre-pandemic data, had a sharp decrease in January-March 2021 (PPP = 0.04), suggesting strong evidence of a higher occurrence of the phenomenon than initially expected.

Conclusions

In 2020, a declining trend of suicidality was observed in April-June 2020 among both girls and boys, prolonged throughout the whole year among boys. Later, an increasing pattern of suicidality was registered in early 2021 (January-March) compared to the pre-pandemic period, more pronounced among girls than boys. The present findings encourage wider adoption of Bayesian approaches as valuable tools to explore rare events with low counts to enlighten open public health issues deeply.

Bibliografia

1. Bland M. 2015. An Introduction to Medical Statistics (section 9.4). Oxford, UK: Oxford Univ. Press. 4th edition.