

Estimating the Prevalence of Severe Psychiatric Disorders among Underages in Italy Using Capture-Recapture Methods

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Extended Abstract

Childhood mental and behavioral disorders strongly impact the social well-being becoming an emerging challenge to healthcare systems globally [1], [2].

The prevalence is the proportion of a population with a disease or a particular condition at a specific point and it is an essential clinical indicator in the healthcare system. So far, several studies have investigated the prevalence of psychiatric disorders in underage people in different areas [3], [4].

This study aimed to evaluate the evolution of the prevalence of severe psychiatric disorders among children (0 - 17 years old) in Italy between 2004 and 2015. Capture-recapture models have been widely used for prevalence estimates based on incomplete samples obtained from health administrative databases (rarely all the subjects in the target population are recorded). Indeed, capture-recapture analysis can be used to improve the prevalence estimate reducing the bias of underestimation due to the incompleteness of the samples. The aim is to estimate the number of unobserved units in the target population based on information on the number of times a person has been observed.

Our data were derived from hospital discharge forms, consisting of all the hospitalizations for psychiatric reasons according to the ICD-9 / ICD-10 code list. A total of 156,557 hospitalizations were recorded in the entire study period. The zero-truncated distributions of the number of hospitalizations per year were almost identical with a strong right-skewed: most of the children were observed just once, but there were few with more than 20 hospitalizations.

We considered a non-parametric Bayesian approach defined in [5], which is based on a Poisson mixture distribution and the corresponding population size estimate is determined through an integrated likelihood reparameterization in terms of a finite number of moments of a suitable mixing distribution. In order to evaluate the reliability of our procedure, we also computed alternative estimators proposed in the literature [6] [7].

The estimated number of severe psychiatric disorders among underages was almost constant during the study period with a value of around 100 - 110 thousand units (95% CI 90 – 250,000 units); considering a population of approximately 10 million, it would indicate a prevalence of 0.011 (95% CI 0.009 – 0.025).

Future steps will be to evaluate the prevalence of severe mental disorders in underages during and after the SARS-CoV-2/COVID-19 pandemic, taking into consideration the recent literature results: several works showed that COVID-19 is having a very strong psychological impact on the global population, especially affecting the most fragile categories, such as minors [8].

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