

Undocumented infections of SARS-COVID-19: preliminary results of the INCIDENT (hIddeN CovID-19 casEs Network estimation) study using the Network Scale-Up estimator

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Background

Undocumented infections seem to have facilitated the geographic spread of SARS-COVID-19. Estimating the percentage of asymptomatic or mildly symptomatic patients is extremely demanding.

Objective

In this study we propose the application of the Network Scale-Up Method (NSUM) using a Bayesian approach to estimate this hard-to-count population.

Methods

These are the INCIDENT (hIddeN CovID-19 casEs Network estimation) study preliminary findings, resulting from an online cross-sectional survey with a snowball sampling. We propose an extension of a precedent NSUM Bayesian estimation method to estimate the unknown network size via Markov Chain Monte Carlo algorithm. One question is proposed to the responder for the estimation of the social network size, randomly drawn from the known populations.

Results

The results reported are from Veneto (711 questionnaires), one of the regions most affected by COVID-19 in the period between 1 of April and 6 May 2020. The modified NSUM computed 10887.31 (credible interval (CI): 11661.44, 65159.35) cases of paucisintomatic COVID-19 with a prevalence of 0.22 (CI: 0.24, 1.33). The COVID positive swabs were 11614.10 (CI: 13572.62, 124483.11) with a prevalence of 0.24 (CI: 0.28, 2.55). The last result is coherent with data reported by official systems: 13908.54 media of cases in the same period.

Conclusions

Knowing the number of asymptomatic COVID-19 cases is extremely important for reducing the spread of the virus. Our approach reduces the number of questions to pose with good results in estimating the number of cases. This approach could be helpful in the proper allocation of resources tailoring the prevention program to the outbreak's containment.