



Lower bound for true incidence of infections based on official case numbers during a COVID outbreak in Germany 2020

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Since the beginning of March 2020, the cumulative numbers of cases of infection with the novel corona-virus SARS-CoV-2 in Germany have been reported on a daily basis. The reports originate from national laws, according to which positive test findings must be submitted to the federal health authorities, the Robert Koch Institute, via the local health authorities. As a considerable amount of unreported cases can be expected, the question how widely the disease has been spread in the population cannot be answered directly based on these administrative reports. By using mathematical modeling for the epidemic, indirect estimates can be made. The models use the fact that in the presence of a temporarily varying case-detection-ratio, the effective reproduction number is estimable more reliably than the number of incident cases. The results of the models indicate that due to the small numbers of diagnostic tests carried out during the early phase of the outbreak, important parts of the infection have not been noticed. In order to cover the initial phase of future waves of the disease, wide-spread and comprehensive tests are recommended.