

Review Article

Covid-19: The Significance of Uniform Sampling and Reporting Methods in Global Health Care Systems

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Abstract

The objective of this mini review is to highlight the critical deficiencies in employing consistent and accurate data collection methods during the Covid-19 pandemic. These shortcomings resulted in confusion, misinterpretations, stigmatization, and disparate predictions, ultimately hindering the global response to this potentially devastating pandemic. This article emphasizes the importance of uniform sampling and precise data reporting to overcome these challenges.

Keywords: Coronavirus; Biostatistics; Pandemics.

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Introduction

Statistics is a mathematical tool used to examine the relationships within data sets and develop predictive models for future outcomes¹. However, the reliability and efficacy of statistical comparisons and modeling heavily depend on the quality and consistency of the sampled data². In the absence of reliable and uniform sampling methods, statistical analyses may lead to inconclusive findings at best or misleading and harmful conclusions at worst³. In the context of the Covid-19 epidemic, we observed fundamental and evident flaws in the utilization of consistent and accurate data gathering methods.

Shortcomings in Data Gathering

From the onset, the reported data on Covid-19 suffered from two essential shortcomings: non-uniform data gathering methods and incomplete data reporting practices. Different countries adopted varying policies for selecting individuals to be tested and determining the timing of the tests⁴. This diversity rendered the comparison of data from different sources futile and, in some cases, misleading when attempting to construct reliable models for predicting the outbreak's trajectory. Evaluating the correctness of these distinct data collection approaches falls within the purview of individual countries and their testing capabilities, which is beyond the scope of this article. However, it is crucial to emphasize that due to these non-uniform sampling methods, comparing data across countries and constructing accurate prediction models for the future of the outbreak became an arduous task.

Issues with Data Reporting

Another significant problem lay in the

reporting of data. Most countries failed to disclose a crucial component of their data, namely the total number of tests conducted each day to ascertain the reported number of cases, even though testing became globally available within two weeks of the outbreak's commencement⁵. It is important to underscore that without this essential data, the numbers reported by each country resemble a fraction without a denominator, rendering the data largely inconclusive and inadequate for meaningful comparisons and modeling purposes.

Recommended Solutions

To overcome these challenges, it would have been prudent to accumulate uniform testing data that could be used in a universally applicable and reliable prediction model. This should not imply enforcing identical testing requirements across different countries, as such an approach is neither feasible nor plausible. Rather, a uniform and universal method for selecting individuals to undergo testing, ensuring a representative random sample of the general population, should have been explicitly introduced for statistical comparisons and modeling. This sampling approach should have been independent of each country's testing practices for prevention and treatment purposes. In our opinion, an international body like the World Health Organization (WHO) should have urged all countries to randomly test a predetermined number of their population using consistent sampling protocols based on the country's population. Only with such uniform and reliable data could an accurate global prediction model have been developed. For instance, this could have involved sampling one individual per day for every hundred thousand people, randomly

selected from various regions of the country, not limited to disease hotspots. The financial support for conducting these tests, if needed, could have been provided by the WHO, with the tests conducted either by WHO personnel or local health professionals supported by the WHO.

Conclusion

The critical deficiencies in employing consistent and accurate data collection methods during the Covid-19 pandemic should be fully evaluated. The lessons learned must be used to establish better practices for potential future outbreaks similar to this one.

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Footnotes and Financial Disclosures

Conflict of interest:

The authors have no conflict of interest with the subject matter of the present manuscript.