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Short Communication

Roles and challenges of statisticians in COVID 19

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A statistician is one who deals with theoretical and applied statistics.[1] Statistics is used in almost all fields of work such as biology, agriculture, business, economics, medicine, games etc. to arrive at meaningful conclusions from data to guide appropriate action measures.[2] The International Biometric Society (IBS) defines biostatistics as "a field of development of statistical and mathematical methods applicable in the biological sciences."[3] It mainly focuses on the development and application of statistical methods in the field of medical research.[4]

Lewis et al. (1996) stated, "Statistical considerations are not only relevant for the analysis of data but also for design of the trial.[5]" The responsibilities of a biostatistician therefore start from participating in the planning and execution of any research, and extend to the interpretation of results while simultaneously acting as a statistical umpire.[6] The tasks of biostatisticians in systematic reviews and meta-analyses are crucial. They are involved in proper planning, evaluating the quality of individual studies and publication of the results. In observational studies, where confounding factors have major impact on study result, statisticians help in investigating, and deriving relationships between variables using mathematical procedures.[7]

Statistical thinking had made important contributions to understanding of epidemics also. Statistician have a major role to play in epidemics. Their work includes estimating the number of individuals infected, calculating secondary attack rate, R_0, estimating the incubation period, knowing the aetiology of these viral diseases, estimating predictions of trends of diseases based on current patterns which helps in forecasting and monitoring the course of the epidemic.[8]

COVID-19 affected the world in all aspects of living ranging from health, economy, agriculture, food, mobility, pollution, waste to social factors. This necessitated coordinated response from people involving all sectors and required a teamwork. Bio-statistician and epidemiologist are important members of a team of an epidemic investigation. They help in confirming the existence of an epidemic, estimate the burden, analyze the distribution pattern, determine the cause/s and associated factors, estimate the impact and guide policies for achieving control and future trends of the epidemic. They are a part-and-parcel of any country's national and local health committees, which provide projections of number of expected COVID-19 cases and mortality data. They precisely predict the effect of lockdowns and social distancing measures on flattening the curve. They are also instrumental in determining the local R_0 (transmission and risk of spread). They are the cornerstone of all COVID-19 research team with a definite and important role from conception of research question, data-management, statistical analysis, and writing of any manuscript for timely publication to dissemination of novel aspects of knowledge related to this rapidly evolving new disease.[9]

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Apart from exploring into the health related aspects of the disease, statisticians are essential to inform on lockdown scenarios, impact of epidemic on economy and labor market, determining association of disease with specific dwelling conditions, socio-economic status or background. Statistics is also required to answer other pertinent questions such as, when to safely re-open schools and to re-start businesses? How to commute and travel without transmitting or contracting infection by determining risks of transmission in specific scenarios? How to support those people most affected by the crisis – the millions who have lost their livelihoods or their loved ones? What is the impact of disease on local labor markets? How to address the already serious inequalities arising out of COVID19? Prediction of future course of disease in the world? Is it possible to foresee areas with high risk of new outbreaks by developing models for surveillance?

There are challenges for statisticians during COVID-19. Some of them are understanding the complexity of clinical endpoints such as the admission to intensive care, invasive ventilation and survival, the need of supportive oxygen along with common statistical pitfalls in clinical epidemiology. Other difficulties are data sharing, communicating statistical effects, distinguishing them from artefacts and flooding of research papers related to COVID-19.

Biostatisticians and epidemiologists will play a pivotal role in solving the coronavirus crisis and thereby help normalize our world. These professionals, who use standard statistical techniques to address issues of human health, have specialized skills, which are essential in the coming months to fight this pandemic on behalf of humanity. An understanding of key concepts of epidemiology, clinical medicine, along with statistical concepts in a teamwork-enabled environment would pay rich dividends for them as well as the people all over the world.[10]

1. Conflict of Interest

None.

References

1. Wikipedia. Royal Statistical Society Stats Life Types of Job. (accessed 5 July 2020). Available from: https://www.statslife.org.uk/careers/types-of-job.
2. O*NET OnLine. Summary report. (accessed 5 July 2020). Available from: https://www.onetonline.org/link/summary/15-2041.00.
3. The international biometric society. Definitions. (accessed 5 July 2020). Available from: http://www.biometricsociety.org/about/definition-of-biometrics/.
4. German society for medical informatics. (accessed 5 July 2020). Available from: http://www.gmds.de/fachbereiche/biometrie/index.php.
5. Lewis JA. Statistics and statisticians in the regulation of medicines.
6. Mansmann U, Jensen K, Dirschedl P. Good biometrical practice in medical research-guidelines and recommendations. *Informatik, Biometrie und Epidemiologie in Medizin und Biologie*. 2004;35:63–71.
7. Zapf A, Rauch G, Kieser M. Why do you need a biostatistician? *BMC Med Res Methodol*. 2020;20(1):23.
8. Brookmeyer R. AIDS, Epidemics, and Statistics. *Biometrics*. 1996;52(3):781–96.
9. Yousuf M. What role has statistics to play in fighting Covid-19? . (accessed 5 July 2020). Available from: https://www.researchgate.net/post/What_role_has_statistics_to_play_in_fighting_Covid-19.
10. Geher G. The Role of Statistics in Fighting the Coronavirus. (accessed 5 July 2020). Available from: https://www.psychologytoday.com/us/blog/darwins-subterranean-world/202003/the-role-statistics-in-fighting-the-coronavirus.

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