Guest Commentary

Statistics: An Intrinsic Part of Everyday Life

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ARTICLE INFO

*Guest Editor: Special issue

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"Learning is not child's play; we cannot learn without pain."
— Aristotle

Fast becoming an ever-present reality in our day-to-day lives, statistics play an intrinsic and contemporary role in our everyday activities, especially, in today's data-driven world. Owning to its definition as the science of collecting, summarizing, presenting and interpreting information, statistics helps us understand the world a little bit better through numbers as well as other quantitative and qualitative source of information.

Although statistics originated many centuries ago, its impacts and applications have evolved in recent years as modern statisticians have advanced applications of statistics through innovative, problem-solving approaches, far beyond its historic use by governmental offices to capture censuses in order to track population sizes and growths (Michigan Technological University, 2021). One of these modern statisticians was Sir Ronald Aylmer Fisher (1890 - 1962) who was active as a mathematician, statistician and geneticist. Although trained as an (evolutionary) biologist, Fisher was referred to as the "father of the modern science of statistics" as he single-handedly created the foundations for modern statistical science (Anders, 1998). He further pioneered the design of experiments principles, small samples statistics and the analysis of real data. He went on to published a book titled "*Statistical Methods for Research Workers*" in 1925, which later became one of the 20th century's most influential books on statistical methods and even to date. His notable works includes the popularly used F-test, F-distribution, Fisher's exact test, maximum likelihood estimation, random effects models and analysis of variance, to mention a few.

The importance of statistics being relevant to nearly every area of our lives cannot be overemphasized enough, to the extent that all countries over the world have at least one national statistical agency operating within their respective countries that manages critical information related to labour trends, health, education, political campaigns and many more. Statistics has influenced and is still influencing the operations of industries such as the sales and financial markets, profit and non-profit organizations, meteorological services, medical care services, manufacturing, urban planning, education, law, and even social media analytics (to mention a few). In this present world, we as individuals and organizations regularly use statistics to make daily financial and non-financial planning and budgeting decisions that affects our lives. For example, consider the daily forecasted weathers, lending risks at banks, impacts of economy crises, healthcare financial policies, traffic flow operations, investment payoffs, urban planning with respect to population growths and declines, predicting diseases, stock markets, human psychology behaviours, insurance pay-outs, and political election results. All these, and more, are statistics and/or derived from statistics. Another simple life application of statistics is the global daily recorded number of COVID-19 cases, deaths, recoveries and vaccination numbers. As of 23 August 2021, a total of 212,679,403 COVID-19 cases were recorded, with 4,446,610 deaths and 190,301,359 recoveries, with majority of these cases reported in the United States of America, India, Brazil, United Kingdom, France, Russia, Turkey and Italy (Worldometer, 2021). Again, all these basic figures were all compiled through the use of statistics in various regions, states, countries, provinces and continents all over the world. Thus, statistics is heavily used in many different fields for a variety of applications as showcased in this journal issue.

In this journal issue, a total of ten original research articles have been assembled, with different fields of statistics applications and techniques. These statistical applications were in aviation, education studies, health sciences, economics and management, population studies, customer relation management, crime analysis and curriculum studies, using several statistical techniques such as generalized linear models, zero-inflated generalized linear models, structural equation modelling, Kaplan-Meier and Cox proportional hazard, and longitudinal data analysis with generalized estimating equations. To be precise, Amwaama, Oyedele and Kazembe used a binary logit, probit and latent class modelling technique on information collected from departing air passengers at Eros and Hosea Kutako International airports in Windhoek, Namibia, to model passengers' stated preferences in choosing between Low-Cost Carriers (LCC) and Full-Service Carriers (FSC), in addition to examining the determinants of carrier choice between LCC and FSC in Namibia. They found that factors such as passenger's airfare, age, income and purpose of travel were significantly important with respect to the passenger choice and that passengers had different preferences for different destination be it domestic, regional (short haul) and international (long haul). For domestic and regional flights, the passengers preferred LCC, while the FSC was preferred for international flights. Their study further recommended that the best, viable and appropriate carrier in and within Namibia should be an LCC, which can ensure sustainability. Similarly, Nakunipa, Pazvakawambwa and Iiyambo study used a binary logistic regression technique to establish the prevalence and factors influencing schizophrenia symptoms using information obtained from the Namibia demographic and health survey. It was revealed in their study that the prevalence of schizophrenia symptoms in Namibia was 12.4%. Also, females were more likely to have schizophrenia symptoms, while people who resided in urban areas and did not consume alcoholic drinks were less likely to have schizophrenia symptoms Their study further recommended that there is a need to step up gender-specific mental health programs especially in rural areas.

Mumbuu, Pazvakawambwa and Oyedele used the zero-inflated generalized linear modelling technique that caters for excess zeros within datasets to explore the influencing factors that affects grade 10 learners'

pass rate in the Khomas region of Namibia, based on information extracted from the directorate of national examination and assessment. In their study, it was revealed that the age of the learners, school location and the type of school had significantly influenced the pass rate of grade 10 learners. Their study further revealed that the zero-inflated negative binomial technique was the best-fit model to use in the modelling of the factors which influenced Khomas region grade 10 learners' pass rate. For these reasons, it was recommended that more schools be built in densely populated areas so that classrooms are not overcrowded per subject, in addition to overaged learners being given extra teaching assistance and attention.

Likewise, Shipanga, Oyedele and Matengu used a negative binomial regression modelling technique to perform an inference mortality analysis across all ages and both sexes in Namibia as well as across regions and marital status using information collected from the civil registration vital systems. Their study revealed that there was a significant relationship between mortality and the individuals' age, sex, marital status and region. In addition, Oshana, Kavango East, Khomas, Hardap and Omaheke regions had high mortality rates, while infants and elderly individuals had a high probability of dying. For these reasons, their study recommended that interventions such as affordable and proper health care and well-being services targeted at the (most) vulnerable age groups, marital group and regions be immediately made available, in order to meet goal 3 of the health-related sustainable development goals of the United Nations.

Moreover, Shinyemba and co-authors used the structural equation modelling technique to model the direct and indirect effects of socio-economic, socio-demographic and health attributes on fertility, as well as the proximate and non-proximate determinants of fertility in Namibia. Their study showed that the proximate determinants had a direct negative impact on the number of children ever born, while a positive effect existed between the non-proximate determinants and the number of children ever born. In addition, women who had their first birth at the beginning of their reproductive period as well as those who had their first marriage at younger ages were more likely to have more children. For these reasons, their study recommended that there is a need to promote contraceptive use among Namibian women

to further reduce fertility rates among women from poor households as the cost of raising children has become high as the year progresses. Similarly, the study by Isaacs, Lwendo and Kazembe used the structural equation modelling technique to establish the impact of passenger loyalty on Customer Relationship Management (CRM) in delivering high quality service to passengers and value creation using survey data collected from international, regional and domestic passengers using Air Namibia for passengers travelling through the Hosea Kutako International and Eros Airports. Their study revealed that factors such as customer orientation, operational specialties, domain expertise, and service recovery and information technology contributed to passenger's satisfaction with Air Namibia's value chain activities, while factors that contributed to passenger's retention and loyalty towards Air Namibia's products and services included marketing and promotional activities, loyalty aspects, value for money and comfort issues. Their study also found that interpersonal relationships between staff and the customers were crucial to CRM initiatives as they can result in a better understanding of customer needs, which in turn leads to passenger loyalty.

Oyedele, Angula and Mutorwa used the Kaplan-Meier and Cox proportional hazard techniques to estimate the survival of employment longevity for employed adults in Namibia using information extracted from the Namibia labour force survey. Their study revealed that employed adults' characteristics such as age group, type of employer, highest education attained, marital status, region, current schooling status and sex had a significant association with their survival of employment longevity. Additionally, employees aged 30-39 and 40-49 years, employed in non-profit institutions, parastatals and government institutions, and from the Oshikoto, Omaheke, Oshana, Khomas, Erongo and Otjozondjupa regions had a high survival of employment longevity, while employees employed in privately-owned informal enterprises and had already attained a technical or vocational certificates/diplomas, junior and senior secondary education had a low survival. Their study further recommended that all relevant organizations and governmental ministries that deals with employment and labour matters should frequently engage all employers through their respective human resources departments, to further assist in the creation and implementation of favourable employment contracts that best suits their respective employees. Unandapo and Ntjamba analyzed reported crime data in the Windhoek municipal area using longitudinal data analysis with generalised estimating equations to compare snapshots of crime over time while considering the correlations within the data. Their study revealed that the best correlation structure was the exchangeable correlation structure, which assume constant correlation over time.

Conversely on the same Windhoek crime data, Amunyela, Neema and Pazvakawambwa used a zero-inflated negative binomial – generalized linear mixed model to model factors related to property crime (theft and burglary) - where they assumed the data is aggregated at zone level. Random effects were then assigned to each of the 59 policing zones in City, with the goal of highlighting areas likely to experience property crime. Crime was high during spring and winter time during the study period. The study further discovered that areas with high population densities have a high crime intensity.

In a nutshell, supporting the words of the famous English writer Herbert George "H. G." Wells (1866 - 1946) who once said:

> *"Statistical thinking will one day be as necessary a qualification for efficient citizenship as the ability to read and write"*,

the applications of statistics and its methods are fast becoming an unavoidable intrinsic need in every area of our day-to-day lives. It might be useful to mention at this junction that the Department of Computing, Mathematical and Statistical Sciences at the University of Namibia, Windhoek, currently offers a range of statistics-affiliated qualifications:

- *BSc in Statistics (NQF level 8)*
- *BSc in Population Studies (NQF level 8)*
- *MSc in Applied Statistics & Demography (NQF level 9)*
- *MSc in Biostatistics (NQF level 9)*
- *PhD in Applied Statistics (NQF level 10)*
- *PhD in Population Studies (NQF level 10)*

as well as new data science affiliated programs as from 2023 onwards:

- *Diploma in Applied Statistics (NQF level 6)*

- *Diploma in Computing (NQF level 6)*
- *BSc on Computing (NQF level 7)*
- *BSc in Data Science (NQF level 7)*

- *Postgraduate Diploma in Applied Research Methods (NQF level 8)*

For more information about these qualifications and programs, interested persons are encouraged to contact Dr. Opeoluwa Oyedele at ooyedele@unam.na or Dr. Samuel Nuugulu at snuugulu@unam.na.

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