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Leveraging Statistical Techniques in Religion and Decision-Making: Focus On the Catholic Church

Reuben Cheruiyot Lang'at

2025-11
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
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Lang'at, R. C. Leveraging Statistical Techniques in Religion and Decision-Making: Focus on the Catholic Church.

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SJIF Impact Factor(2025) : 8.691
ISI I.F.Value : 1.188

ISSN (Online): 2455-3662
DOI : 10.36713/epra2013

EPRA International Journal of

MULTIDISCIPLINARY RESEARCH

Monthly, Peer Reviewed (Refereed) & Indexed International Journal

Volume - 11 Issue - 11 November 2025

IJMR

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ISSN (Online) : 2455 - 3662
SJIF Impact Factor(2025) :8.691
ISI I.F. Value : 1.188
DOI : 10.36713/epra2013

EPRA International Journal of

Multidisciplinary Research

Monthly Peer Reviewed & Indexed International Online Journal

Volume: 11 Issue: 11 November 2025

Indexed By:

Published By :EPRA Publishing

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ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 11| Issue: 11| November 2025|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2025: 8.691 || ISI Value: 1.188

LEVERAGING STATISTICAL TECHNIQUES IN RELIGION AND DECISION-MAKING: FOCUS ON THE CATHOLIC CHURCH

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Article DOI: https://doi.org/10.36713/epra24992
DOI No: 10.36713/epra24992

ABSTRACT

This paper explores how statistical techniques can be leveraged in religion, with a particular focus on the Catholic Church. An overview of census from a biblical perspective has been given. While religion is often perceived as belonging to the realm of faith and spirituality, religious institutions increasingly depend on empirical data to inform their decision-making processes. Using both descriptive and inferential approaches, this study demonstrates the role of statistical methods in enhancing pastoral planning, resource allocation, financial stewardship, and youth engagement. The analysis begins with a broad overview of religion and statistics, moves into global and East African contexts, and narrows to Kenya, the Catholic Diocese level, and the administrative unit of Parish. Tables and illustrative data provide practical examples of how statistics can guide decisions. The paper concludes by emphasizing that integrating statistical methods in religion does not undermine faith but strengthens the capacity of institutions to fulfill their mission effectively.

KEYWORDS: *Statistics, Catholic Church, Religion, Decision-Making, Parish, Diocese*

INTRODUCTION

In statistics, a researcher can either use census or sampling approach to carry out an investigation. Census-taking is not a new concept in the Bible; it appears several times, where leaders counted people to understand the composition and strength of their communities. During the times of Moses, *"The Lord spoke to Moses in the Tent of Meeting... 'Take a census of the whole Israelite community by their clans and families, listing every man by name, one by one…."Take a census of the whole Israelite community... from twenty years old and upward."*

New international Version (NIV 2011), (Numbers 1:1–3, 46). This shows that census-taking had divine approval and administrative importance — to know the population and structure of the nation and to plan for land allocation and military organization, illustrating how demographic knowledge supports governance and planning. The New Testament also has scripture that show Census at the Time of Jesus' Birth (Luke 2:1–5). *"In those days Caesar Augustus issued a decree that a census should be taken of the entire Roman world."* This Roman census was a civil administrative act that led to Joseph and Mary going to Bethlehem, where Jesus was born. It shows that censuses were part of legitimate governmental functions even in the New Testament era.

In the modern days one can still refer to the Biblical scriptures and use statistics to enhance the understanding of diversity (Romans 12:4–5) *"For just as each of us has one body with many members... so in Christ we, though many, form one body."* An interpretation of this is that recognizing religious diversity fosters unity and cooperation- there can be many forming one for example in a country or community. Statistics can therefore, on this context, point out the vulnerable in the society and foster promotion of justice and inclusivity. (Proverbs 31:8–9) *"Speak up for those who cannot speak for themselves... defend the rights of the poor and needy."* Perhaps out of this and realizing the need to support the weak, the Catholic Church has established the Catholic Justice and Peace Department (CJPD). Religious data help policymakers ensure fairness and equitable resource allocation for all groups.

Religion has long played a central role in shaping human societies, providing moral guidance, social cohesion, and community identity. However, in the 21st century, religious institutions also face managerial, financial, and social challenges similar to those of secular organizations. Growing populations, resource constraints, youth disengagement, and interfaith dynamics compel religious leaders to adopt systematic approaches to decision-making.

Statistics—defined as the science of collecting, analyzing, interpreting, and presenting data—offers valuable tools for such contexts. From counting members and sacraments to projecting financial flows and analyzing community needs, statistical techniques provide religious leaders with evidence-based insights. While some may perceive tension between faith and science, history demonstrates that religious institutions have long employed data for administrative purposes. For example, the Vatican has kept meticulous baptismal and marriage records for centuries, which today serve as rich datasets for demographers.

ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 11| Issue: 11| November 2025|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2025: 8.691 || ISI Value: 1.188

This paper investigates how statistical techniques can be integrated into religion, focusing on decision-making within the Catholic Church. Beginning with general applications across religions, the paper then contextualizes the discussion within Catholicism, highlighting global, East African region, Kenyan context, diocesan, and parish perspectives.

LITERATURE REVIEW

The intersection of religion and statistics is not new. The sociology of religion has often relied on statistical surveys to measure religious affiliation, church attendance, and belief systems (Hastings, 1994; Pew Research Center, 2021). Quantitative approaches are essential for understanding how religion interacts with social and economic development.

In organizational contexts, religious institutions—like businesses or governments—require reliable data for planning. Zech (2016) emphasizes that parishes using data-driven stewardship models report higher levels of financial sustainability. Similarly, the World Council of Churches (2018) argues that statistical monitoring enhances accountability and transparency.

In Africa, statistical techniques are particularly important due to rapid population growth and religious pluralism. Mugambi (2020), notes that Faith-Based Organizations are central to service provision, and thus require empirical data to manage schools, hospitals, and development projects effectively.

Despite this recognition, many parishes and dioceses underutilize statistics, often relying on anecdotal evidence or intuition. This creates gaps in planning, resource allocation, and youth engagement. This paper therefore builds on existing literature to argue for a systematic integration of statistics in Catholic decision-making.

Globally, the Catholic Church is the largest single Christian denomination, with over 1.26 billion members as of 2020 (Pew Research Center, 2021). Yet the distribution of Catholics is uneven across continents. Europe, once the stronghold of Catholicism, has witnessed a steady decline in religious practice, while Africa and Asia continue to register rapid growth.

Statistical monitoring of global Catholic demographics provides critical insights for Vatican-level decision-making. It informs the establishment of new dioceses, allocation of missionary priests, and prioritization of theological training. For example, the rise of Catholicism in sub-Saharan Africa has prompted the Vatican to expand seminaries and strengthen catechetical programs in the region.

Table 1: Global Distribution of Catholics by Continent (2020)

Continent	Catholic Population (millions)	Percentage of Global Catholics	Annual Growth Rate (%)
Africa	251	19%	2.8
Asia	149	11%	1.5
Europe	285	21%	-0.2
Latin America	483	36%	1.2
North America	85	6%	0.5
Oceania	9	1%	0.8

Source: Pew Research Center, 2021.

Table 1 underscores the importance of statistical analysis in understanding where Catholicism is thriving and where it is in decline. Decision-making at the highest levels of the Church must be grounded in such data to ensure strategic and equitable pastoral responses.

In East Africa, Catholicism has played a central role in shaping education, health, and social development. Missionaries introduced formal schooling and healthcare, leaving behind an enduring institutional presence (Hastings, 1994; Mugambi, 2020). Statistical techniques have been particularly useful not only for understanding Catholic population dynamics across the region but also doing important forecasts that can help in planning for project development and financial allocation. This way the church is put at a vantage point which ensures sustainability.

As shown in Table 2, Catholic population shares differ considerably, from 22% in Kenya to 57% in Burundi. These disparities reflect historical missionary encounters, colonial legacies, and local socio-cultural receptivity to Catholicism. Statistical comparisons of this kind assist religious leaders in benchmarking pastoral strategies across national borders.

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Table 2: Catholic Population in Selected East African Countries (2019 Census Data)

Country	Total Population (millions)	Catholics (millions)	% Catholic
Kenya	47.6	10.6	22%
Uganda	41.6	13.0	31%
Tanzania	58.0	14.2	24%
Rwanda	12.6	6.2	49%
Burundi	11.5	6.5	57%

Sources: Kenya National Bureau of Statistics, 2019; Uganda Bureau of Statistics, 2019; Pew Research Center, 2021.

The table underscores how the Catholic Church must avoid "one-size-fits-all" approaches to evangelization and governance. In Burundi, where Catholics form a majority, decisions may focus on strengthening Catholic identity within national institutions. In contrast, in Kenya and Tanzania, where Catholics constitute about one-fourth of the population, statistical insights help the Church remain competitive in an increasingly pluralistic religious environment.

Kenya offers an illustrative national case of how statistics inform religious decision-making. According to the 2019 Kenya Population and Housing Census, 85.5% of the population identifies as Christian, with 22% identifying as Roman Catholic (KNBS, 2019). This makes Catholics one of the largest single denominations in the country. Catholic institutions in Kenya include over 7,000 schools, 58 hospitals, and numerous social welfare programs, all of which require evidence-based planning and management (AMECEA, 2020).

The Catholic Church in Kenya has historically relied on parish censuses to track sacramental participation (baptisms, confirmations, marriages) and to plan catechetical programs. More recently, dioceses have adopted modern statistical tools, such as parish mapping through Geographic Information Systems (GIS) and the use of survey research for youth engagement (Mutai, 2021). Such approaches help leaders identify underserved areas, allocate clergy, and design context-sensitive pastoral programs.

Statistical methods have also been vital in addressing interfaith dynamics. Kenya is religiously pluralistic, with Muslims constituting about 10% of the population and evangelical churches rapidly expanding. Statistical monitoring of denominational trends could actually assist the Catholic Church in sustaining its visibility and in making strategic alliances with other faith communities for peace-building and development projects (Gichure, 2018).

The Roman Catholic Church in Kenya as at 2025 had 4 Metropolitans and 24 Suffragan dioceses making a total of 28 dioceses. These include the four Archdioceses and one Military Ordinariate diocese (Catholic-Hierarchy, 2025). A diocese covers areas that ordinarily do not align or conform to the current county administrative units. For instance while the Catholic diocese of Kericho covers Kericho, Bomet, and parts of Nakuru counties, the Diocese of Nakuru itself covers the remainder of Nakuru, Baringo and Narok. On the other hand that of Kakamega is mostly the Kakmega County alone. Most of the dioceses have experienced steady growth due to high fertility rates and active lay movements. However, like many dioceses in Africa, some have challenges of limited priestly vocations in relation to the growing population, uneven distribution of resources, and shifting youth religious participation. These facts were reinforced by the findings of study conducted in one of these parishes.

In one of the diocesan pastoral office it was noted that it had experimented with data-driven planning. For instance, offertory contributions are monitored quarterly to assess parish financial health. Enrollment data from Catholic schools are used to project teacher needs, while demographic statistics help in identifying areas for establishing new parishes and even determine the specific spiritual strategy that meets the expectation as determined by the data collected. There is a strong indication that the use of statistical forecasting models would enabled the diocese to anticipate changes in Mass attendance and offertory collections, helping leaders plan for sustainability.

As shown in Table 4, time-series forecasting of offertory collections (2015–2025) allows diocesan leaders to anticipate revenues and align them with infrastructural and pastoral investments.

Parish Case Study

One Parish in a Diocese not mentioned for anonymity provided a localized case where statistical analysis done showed that it actually enhanced decision-making. Like many rural parishes in Kenya, the parish faced declining youth participation in regular Mass attendance, even though sacramental participation (especially baptisms and weddings) remained strong. Parish leaders conducted a survey in 2021 to identify factors influencing youth attendance.

Inferential tests confirmed that age group and education level significantly influenced Mass attendance, while gender differences were not statistically significant (see Table 3). These findings suggest that disengagement is more closely linked to age and schooling than to gender, pointing to the need for targeted youth formation program

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Table 3: Inferential Statistical Results (Parish Youth Attendance Study)

Variable	χ^2 (Chi-square)	df	p-value	Interpretation
Age group vs. Mass attendance	18.4	3	0.001	Significant
Gender vs. Mass attendance	2.1	1	0.15	Not significant
Education level vs. attendance	9.6	2	0.008	Significant

Source: Parish Survey, 2021.

The use of inferential statistics enabled parish leaders to move beyond anecdotal explanations to evidence-based conclusions. Instead of assuming that disengagement was a matter of gender preference, data showed that interventions should focus on adolescents and young adults in transition to higher education.

Forecasting Financial Stewardship in a Diocese

One of the most critical applications of statistics in religion is financial stewardship. The Catholic Church depends on offertory collections, donations, and projects to sustain its operations. Forecasting helps dioceses anticipate revenue changes due to demographic shifts, economic cycles, or external shocks (e.g., the COVID-19 pandemic).

As shown in Table 4, the Diocese's (name withheld for confidentiality) offertory collections analyzed using an ARIMA forecasting model to project revenues up to 2025.

Table 4: Forecasting the Diocese Offertory Collections (2015–2025 Projection)

Year	Actual Collections (Ksh millions)	Forecast (ARIMA model)
2015	120	118
2016	125	124
2017	133	130
2018	140	137
2019	145	144
2020	138	142
2021	150	148
2025	—	168 (forecast)

Source: Diocese Pastoral Office, 2021 (illustrative).

These results show that despite short-term fluctuations (such as the decline in 2020 during the pandemic), offertory collections are projected to grow steadily, reaching an estimated Ksh 168 million by 2025. This information helps diocesan leadership allocate funds prudently, plan new projects, and avoid financial crises.

DISCUSSION

The integration of statistical techniques into religious decision-making demonstrates that faith and science are not necessarily at odds but can work synergistically to enhance organizational effectiveness. From global trends to parish-level case studies, statistics provide clergy and lay leaders with a systematic framework for analyzing data, testing assumptions, and making informed decisions.

At the global level, the Catholic Church benefits from statistical monitoring of membership trends across continents. The growth of Catholicism in Africa and Asia, contrasted with decline in Europe, highlights the need for differential pastoral strategies. Statistical demographic analyses support Vatican-level planning in terms of resource allocation, missionary work, and clergy training (Pew Research Center, 2021).

In East Africa, cross-country comparisons show that the Catholic presence varies widely, from majority status in Burundi to minority status in Kenya. Statistical benchmarking enables leaders to adopt context-sensitive strategies that address both challenges and opportunities.

In Kenya, the Catholic Church has embraced data-driven approaches in health, education, and interfaith dialogue. The case Diocese exemplifies how diocesan leadership can employ financial forecasting and demographic projections for sustainable growth. At the Parish selected for the study, inferential statistics provided a concrete example of how statistical testing can move decision-making beyond intuition to evidence-based strategies targeting youth engagement.

Generally, the research reveals that statistics in religion serve three major functions. Firstly, descriptive statistics enables documentation of trends in population, sacraments, and finances.

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This provides a summary of information and the basis of any decision making. Secondly inferential statistics on the other hand gives the basis of testing relationships and identifying significant factors influencing faith practice. Thirdly, for planning purposes certain activities require future projections to prompt early preparation or laying down of preventive measures in the event of possible adversities. Such activities may include disease outbreaks or projecting future participation, financial health, or institutional growth, for this statistics is crucial.

Ethical Considerations

While the use of statistics offers enormous benefits, religious organizations must also consider ethical concerns. These may include aspects requiring confidentiality, parishioners' sacramental and financial data which should be anonymized to protect individual privacy. Other activities such as surveys and research conducted within parishes must seek voluntary participation and informed consent. At all times when analyzing or interacting with data, leaders must be cautious not to manipulate statistics to suit pre-determined agendas. Transparency and unbiased approach in reporting and methodological rigor is essential. Lastly statistical analysis should support rather than undermine religious belief, ensuring that data-driven insights complement rather than replace spiritual discernment. This way respect for faith is maintained. Balancing these ethical principles ensures that statistical practices in religion strengthen trust, accountability, and stewardship without alienating the faithful.

Conclusion and Recommendations

This paper has demonstrated that statistical techniques can significantly enhance decision-making in religious contexts, with a special focus on the Catholic Church. Beginning with general cases across religions and narrowing to the Catholic experience globally, regionally, nationally, and locally, the analysis has shown how descriptive, inferential, and predictive statistics can be applied to membership, sacramental life, youth participation, and financial stewardship.

The case studies of a Diocese and a Parish illustrate that even at the grassroots level, statistical tools empower church leaders to base strategies on evidence rather than assumptions. Forecasting offertory collections and testing factors influencing Mass attendance exemplify practical applications that inform resource allocation and pastoral planning.

Recommendations

From this research it can be recommended that effort should be made to institutionalize Parish Data Systems. Catholic dioceses should adopt standardized data collection tools (digital parish censuses, sacramental registers, offertory tracking systems). This will enhance the quality of data, improve storage and facilitate data retrieval when required. Even with this, proper data collection analysis, interpretation and use will require some technical skills that can be achieved through capacity building. Clergy and lay leaders should be trained in basic statistical literacy to interpret and apply findings effectively. Depending on the nature and the information needed, it may be necessary to have collaborations with institutions of higher learning. Religious institutions should partner with academic institutions for advanced statistical analyses, such as GIS mapping and predictive modeling.

Youth disengagement is another area with a growing concern, to understand the youth challenges and propose concrete solutions more focused statistical surveys should be carried out. This will help design evidence-based interventions.

As in any research ethical policies must be complied with. As a product of this research a diocesan-level data ethics committees need to be established to safeguard confidentiality, transparency, and the proper use of statistics in decision-making.

In general, the fusion of statistics with religious governance does not diminish the spiritual mission of the Christianity but strengthens it by ensuring that resources, programs, and strategies are rooted in accurate, evidence-based insights. This enhances accountability, sustainability, and inclusivity in a rapidly changing world.

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EPRA International Journal of Multidisciplinary Research (IJMR)
Volume - 11 Issue - 11 November 2025

ISSN 2455-3662
9 772455 366000

Published By :EPRA Publishing