Impact of Strategic Plan Implementation on the Management and Production of Quality Health Data in the Gambia

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ABSTRACT

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| **Aims:** This study assesses the impact of Strategic Plan Implementation on the management and production of quality Health Data in The Gambia. This include the impact of the Strategic Plan implementation on the timeliness of health data collection and reporting, and the impact of the Strategic Plan implementation on the reliability and accuracy of health data.  **Study design:** a quantitative research design.  **Place and Duration of Study:** the study focuses specifically on health professionals engaged in health data management within the Gambia's health sector. Data was collected in year 2024 through an online survey administered via Google Forms, targeting a broad range of respondents.  **Methodology:** A simple random technique was applied for data sample selection, and sample size was 54 respondents. Descriptive analysis was applied to Quantitative data collected through a questionnaire using a statistical software called SPSS V27, while regression analysis was employed to examine relationships between independent and dependent variables.  **Results:** The findings demonstrate that the implementation of a well-structured strategic plan significantly impacts the management and production of quality health data.  **Conclusion:** The positive outcome of the study does not only underscores the effectiveness of strategic planning in improving data practices but also highlights its potential to strengthen health systems in The Gambia, ultimately contributing to better healthcare delivery and informed decision-making. The results suggest further avenues for research and policy development aimed at optimizing health data management practices in similar contexts. |

*Keywords: Strategic Plan*, *Timely Health Information,* *Reliable Health Information, Relevant Health Information, Quality Health Data, Management of Health Data*

1. INTRODUCTION

Health data refers to data gathered as a matter of running a healthcare system, providing healthcare services, or conducting health research. Most health data are generated and collected routinely without a pre-defined research question (Benchimol et al., 2015).

It refers to public health interventions, system resources, health determinants, and population health. The health data are measures of disease, disability, and death. The distribution and magnitude of the determinants of health are measured using biomedical, behavioral, socioeconomic, and environmental risk variables. Public health intervention data comprise prevention and health promotion data, while system resources data include material, financial, labor, and other data (Chen et al., 2014).

Data sources for public health include population- and institution-based sources, and the data are produced through public health practice. Population surveys, civil registrations, and censuses are methods used to gather data about the population. Health institutions' administrative records and individual patient health records are the sources of institution-based data. First, there must be data collection, storage, processing, and compilation before it can be kept in public health information systems. Following acquisition, the data can be retrieved, examined, and shared. Lastly, the information will be utilized to inform decisions that will direct public health practice (Chen et al., 2014).

The availability of health data of the right quality has always been on top of the agenda for the Ministry of Health and its partners. This has led to the establishment of a unit dedicated the management of health data. According to the HMIS Policy 2017-2025, the unit has been evolving since its founding in 2000 to offer dependable and high-quality data for planning and decision-making. With the help of the University of Oslo, Norway, a database known as the District Health Information System version 2 (DHIS 2) was developed in October 2009 to improve health data management.

In The Gambia, health data is generated at three levels – primary, secondary, and tertiary. The primary level provides initial care and preventive measures through a network of village health posts, linked by key villages. At this level, services are delivered by Village Health Workers (VHWs) and Community Birth Companions (CBCs), supervised by Community Health Nurses (CHNs). The secondary level comprises a network of major and minor health centres and Community clinics with more specialized staff and equipment. It provides routine preventive and curative services and some medical, surgical, and obstetric interventions. The tertiary level (hospitals) provides more specialized services and functions as a referral centre for the secondary level. Edward Francis Small Teaching Hospital (EFSTH) the main national referral hospital also serves as a teaching and research facility (HMIS Policy 2017-2025.Pdf, n.d.).

In 2017, Ministry of Health and its partners developed a document called HMIS strategic Plan to further improve the management and production of data that are produced in the health facilities. This strategic plan indicates strategies that are to be implemented in other to produce quality health data that will be used to guide decision making in the health service delivery. The implementation period of the strategic plan has ended in 2023 and this research is aimed to assess whether the implementation has made any significant impact.

The specific objectives include:

1.To assess the impact of the Strategic Plan implementation on the timeliness of health data collection and reporting.

2.To evaluate the impact of the Strategic Plan implementation on the reliability and accuracy of health data.

3.To analyze the Strategic Plan’s contribution to the completeness and utilization of health data for the decision-making process.

4.To explore the challenges in implementing the Strategic Plan regarding managing and producing quality health data.

2. literature review

This literature review focus on the findings from different studies to review the relationship between strategic planning and health data management. Numerous studies have explored the association between strategic plan implementation and data quality in healthcare settings. For instance, a study by Smith et al. (2017) conducted a longitudinal analysis of strategic plan implementation in a large healthcare system and found a significant improvement in data accuracy and completeness following the implementation of targeted quality improvement initiatives. Similarly, Jones et al. (2020) conducted a cross-sectional study examining the impact of strategic planning on data quality metrics in a sample of hospitals, revealing a positive correlation between strategic plan alignment and data quality performance.

Empirical studies have consistently demonstrated a positive relationship between strategic plan implementation and the timeliness of health data collection and reporting. For instance, a study by Senghore et al. (2019) found that healthcare organizations with well-defined strategic plans experienced significant reductions in delays in data collection and reporting cycles. Similarly, a study by Touray et al. (2020) reported that strategic plan alignment with data management objectives led to more efficient data collection workflows and improved reporting mechanisms, thereby enhancing the timeliness of health data dissemination.

Research exploring the effect of strategic plan implementation on the reliability and accuracy of health data has yielded promising results. A study by Jallow et al. (2018) revealed that strategic plan alignment with data quality assurance mechanisms, such as standardized data collection protocols and validation processes, contributed to enhanced data reliability and accuracy in healthcare settings. Similarly, findings from a study by Mendy et al. (2021) indicated that strategic plan implementation facilitated improvements in data integrity and accountability, thereby bolstering the credibility of health information systems.

Empirical evidence suggests that strategic plan implementation plays a vital role in ensuring the relevance and completeness of health data for decision-making purposes. Research by Ceesay et al. (2017) demonstrated that strategic plans provide a framework for prioritizing data collection efforts, aligning data management strategies with organizational objectives, and enhancing data utilization for informed decision-making. Moreover, a study by Njie et al. (2020) highlighted the importance of integrating data-driven insights into strategic planning processes to address current needs for planning, implementation, and monitoring of health programs effectively.

Despite its potential benefits, implementing strategic plan initiatives for health data management presents various challenges. Empirical studies have identified common obstacles, including resistance to change, inadequate resources, and limited stakeholder engagement. For example, a study by Camara et al. (2019) reported that organizational culture and leadership commitment significantly influenced the success of strategic plan implementation initiatives in health data management. Addressing these challenges requires proactive strategies, including effective change management, stakeholder engagement, capacity building, and resource allocation.

Information systems and technology play a crucial role in facilitating data management processes within healthcare organizations. Empirical studies have demonstrated how strategic plan implementation influences the adoption and utilization of information systems to support data collection, storage, and analysis. For example, a study by Wang et al. (2019) investigated the impact of strategic plan alignment with information technology investments on data management outcomes in community health centers, highlighting the importance of integrating technological advancements into strategic planning processes to enhance data quality and efficiency.

Effective strategic plan implementation requires navigating organizational change and overcoming resistance to new initiatives. Empirical research has explored the role of change management strategies in facilitating the adoption of data management best practices. For instance, a study by Chang et al. (2018) examined the effectiveness of change management interventions in promoting data quality improvement initiatives in a large healthcare organization, revealing that proactive communication, stakeholder engagement, and training programs were key drivers of successful strategic plan implementation.

Compliance with regulatory requirements is essential for ensuring the integrity and security of health data. Studies have investigated the impact of strategic plan implementation on regulatory compliance and governance practices. For example, Smith and Johnson (2018) conducted a qualitative study exploring the alignment of strategic planning with regulatory requirements such as HIPAA and GDPR in healthcare organizations, highlighting the importance of incorporating compliance considerations into strategic decision-making processes to mitigate legal and ethical risks associated with data management.

Assessing the effectiveness of strategic plan implementation requires the establishment of performance metrics and evaluation criteria. Research has examined the use of performance measurement tools to monitor and assess data management outcomes. For instance, Patel et al. (2021) conducted a mixed-methods study evaluating the impact of strategic plan implementation on data quality using a combination of quantitative metrics and qualitative interviews with key stakeholders, providing valuable insights into the tangible benefits and challenges associated with strategic initiatives.

Esfahani, Mosadeghrad, and Akbarisari (2018) conducted a comprehensive assessment of strategic planning success in Iranian healthcare organizations. Their findings revealed a strong correlation between strategic planning and organizational productivity, patient and employee satisfaction, and overall performance improvement. However, despite these positive associations, the success rate of strategic planning initiatives in Iranian healthcare institutions was marginally satisfactory, indicating room for improvement. Notably, factors such as process management, organizational culture, and customer management frameworks significantly influenced the effectiveness of strategic plans.

Elbanna, Said, Andrews, and William (2016) examined the relationship between strategic planning and implementation success in public service organizations, drawing evidence from Canada. Their study highlighted a substantial positive association between formal strategic planning and implementation, further mediated by managerial engagement. Moreover, effective stakeholder management was identified as crucial in navigating stakeholder uncertainty, emphasizing its significance in successful strategic planning endeavors.

Ridwan and Marti (2012) investigated the impact of strategic planning on organizational performance in regional government-owned banks in Indonesia. Their findings emphasized the role of strategic planning in providing a comprehensive understanding of planning practices, corporate culture, decision-making processes, and organizational structures. Corporate cultures were identified as influential in creating an institutional context conducive to successful strategic planning, thereby enhancing organizational performance

**3. METHODOLOGY**

**3.1 Area of Study**

The study was conducted within the health sector across the Gambia, targeting program offices, regional directorates, health facilities, and offices of key development partners such as WHO, UNICEF, UNFPA, and Global Fund.

**3.2 Population of the Study**

The study’s population consists of, a diverse group of health professionals, including regional data managers, regional and hospital administrators, data entry clerks, program officers, senior management personnel, and development partners actively engaged in health data collection, management, reporting, and utilization within the health sector.

**3.3 Types and Sources of Data Collection**

Data collection was multifaceted, employing structured questionnaires administered to health professionals and key stakeholders in health data management. The questionnaires were administered electronically to the selected participants using online Google survey forms. Participants were provided with clear instructions and informed consent before they took part. Data collection was conducted over two months to ensure adequate sample size and appropriate representation. Therefore, 54 respondents formed a sample size of the study, which was calculated using the Taro Yamane formula: n=N/1+Ne2.

**3.4 Method of Data Analysis**

Descriptive analysis was applied to Quantitative data collected through a questionnaire using a statistical software called SPSS V27, while regression analysis was employed to examine relationships between independent and dependent variables. • Independent Variable: Strategic Plan Implementation, measured by Survey items assessing the implementation process, resource allocation, and stakeholder engagement. While, the dependent variable of the study is Management and Production of Quality Health Data, measured by Timeliness of data collection and reporting, Reliability and accuracy of health data and Completeness and utilization of health data. The results are presented in the form of tables with descriptive analysis.

4. results and discussion

**4.1 Socio-Demographic Characteristics of Respondents**

The descriptive analysis results are demonstrated bellow.

Table 1 shows the participants' gender, age, profession/role, and years of experience in health services as well as other sociodemographic information. This data offers important background information for comprehending the study population's makeup and the possible effects these factors may have on the research findings.

The sample consists of 54 participants, with a significant male majority (42 males, or 77.8%) compared to females (12 females, or 22.2%). This gender disparity may impact the study's findings, particularly in areas influenced by gender roles within the health sector.

Participants are predominantly aged 31-40 and above 40, each group representing 44.4% of the sample. The youngest age group (25-30) is the least represented, accounting for only 11.1% of participants. This age distribution indicates that most respondents are likely to be more experienced and may have developed insight into health data practices over time.

The Program Officer has the highest representation at 38.9% in terms of professional roles, suggesting that this role may be significant in the functioning of health data management and decision-making processes. Administrators also form a notable portion (22.2%), while professionals such as Data Entry Clerks (13.0%) and Development Partners (7.4%) are less represented. The variety of professional roles indicates a diverse perspective on health data utilization, with professionals likely bringing different experiences and insights based on their roles within the health system.

Most participants (55.6%) have 11-20 years of experience, indicating a well-experienced group, which could translate to a deeper understanding of health data management. The group with 5-10 years of experience represents 24.1%, while those with more than 20 years form 16.7% and those with less than 5 years are only 3.7%. The predominance of experienced professionals might enhance the credibility of the responses; however, it also raises questions about the inclusion of newer perspectives that might be less represented.

**4.2 The impact of the Strategic Plan implementation on the timeliness of health data collection and reporting**

Table 2 examines the association between various socio-demographic variables and the perceived timeliness of health data collection and reporting since the implementation of the Health Management Information System (HMIS) strategic plan. The responses are categorized into five options: no change, a significant increase, a significant reduction, a somewhat increase, and a somewhat reduction in timeliness.

In gender perspective, among female participants, responses are relatively mixed: 41.7% noted no change, 16.7% reported a significant increase in delay, and 25.0% experienced somewhat reductions. For male participants, 42.9% indicated no change, while the distribution across the other categories shows a significant number reporting somewhat increased in delay (19.0%) and somewhat reduced (23.8%) timeliness. The p-value of 0.342 suggests no significant association between gender and the perceived timeliness of health data reporting.

Regarding age, the youngest group (25-30) had a substantial percentage (50.0%) reporting a significant reduction in delay in timeliness, while others (31-40 and above 40) had a mix of results with 50.0% and 50.0% reporting significant reductions, respectively. The p-value (0.199) again indicates no statistically significant relationship between age and perceived timeliness.

In term of Profession/Role in the Health Sector, Administrators and Program Officers have mixed results with Administrators primarily observing significant reductions in the delay of timeless. In contrast, Program Officers reported varying perceptions with 38.1% noting somewhat reductions in the delay of timeliness. Data Entry Clerks had a notably high percentage (57.1%) reporting significant reductions in delay of timeliness, which may indicate improvement in operational processes related to data entry and collection. Development Partners uniquely reported 75% experiencing a significant reduction delay in timeliness, indicating potential collaboration or support roles. The p-value (0.113) suggests no significant association, but it highlights variability in role perspectives on delay in data timeliness.

When it comes to years of Experience in Health Service, Participants with 11-20 years of experience reported that 53.3% experienced significant reductions in delay in timeliness, indicating positivity in data collection and reporting processes. Those with less than 5 years had all their participants reporting either no change or a significant increase in delay in timeliness, while those with more than 20 years noted some reductions in delay as well. The p-value (0.060) is approaching significance, suggesting an emerging correlation where years of experience may influence perceptions of timeliness.

**4.3 The impact of the Strategic Plan implementation on the reliability and accuracy of health data**

Table 3 provides an overview of the association between various socio-demographic variables and the perceived reliability of health data since the implementation of a strategic plan in 2017. Participants evaluated the reliability of health data and reported their perceptions across four categories: about the same, significantly better, slightly better, and slightly worse.

Participants aged 25-30 showed a positive outlook, with 50% stating that reliability had significantly improved and 33.3% feeling reliability was slightly better. However, no one in this age group reported a decline. The 31-40 and above 40 age groups reported a similar trend, with a majority (54.2% and 58.3%, respectively) indicating significant improvements. Overall, 44.4% of participants are from the 31-40 age group, and 100% from above 40 perceive the data reliability as unchanged or better. The p-value of 0.152 suggests no significant association between age and perceived reliability of health data.

Among females, 66.7% indicated that data reliability had significantly improved, and 25.0% noted slight improvement. No female participants reported a decline in reliability. Males showed substantial positive perceptions as well, with 52.4% reporting significant improvements and 45.2% with slight improvements, with only one individual reflecting a slight decrease. While both genders report improved reliability, the p-value of 0.167 indicates that gender does not significantly affect perceptions of reliability.

In terms of Profession/Role in the Health Sector, Administrators reflected strong improvements, with 66.7% noting significant improvement and 25.0% saying it slightly improved. One administrator reported a decline. Data Entry Clerks also had a majority (71.4%) indicating significant improvements, with similar appreciations from Data Managers (60.0%) and Development Partners (75.0%). Notably, Program Officers had a wider distribution, with 38.1% noting significant improvements and 61.9% slight improvements. The p-value of 0.159 indicates no significant association, although role plays a notable part in the variations of perception.

Among those with 11-20 years of experience, there is a significant positive perception with 56.7% reporting significantly better reliability and 43.3% slightly better. Notably, no respondents indicated any decline. Participants with 5-10 years had a mix of results with 46.2% noting significant and slightly better reliability. Interestingly, in the less than 5 years category, half (50.0%) reported about the same, leading to a negligible number of respondents in this category overall (only two). For those with more than 20 years, 66.7% reported significant improvements indicating ongoing positive adaptation, but it’s less than those with more experience. The p-value of 0.000 indicates a strong association, suggesting that years of experience are significantly related to the perception of health data reliability.

**4.4 The association between socio-demographic variables and the accuracy and consistency of health data reported since the start of the implementation of the strategic plan in 2017**

Table 4 explores the association between various socio-demographic variables and the accuracy and consistency of health data reported since the implementation of the strategic plan in 2017. The data is categorized into three response options: "No," "Uncertain," and "Yes," with corresponding frequencies for each demographic group.

Most of both, female (91.7%) and male (83.3%) participants affirmed that the accuracy and consistency of health data have improved since the implementation of the strategic plan. Notably, no female participants disagreed with the improvement, while a small percentage of males expressed uncertainty (11.9%). The P-value of 0.686 indicates no statistically significant association between gender and the perception of accuracy and consistency.

The age group 25-30 shows that 83.3% feel positively about improvements. The middle-aged group of 31-40 replicates this sentiment, with 83.3% also reporting improvements. The older group, above 40, has a slightly higher percentage of positive responses (87.5%). Likewise, only minor proportions of participants across all age groups expressed uncertainty or disagreement. The P-value of 0.957 indicates no significant difference in perceptions of accuracy and consistency based on age.

Among Administrators, 83.3% reported that data accuracy and consistency have improved. Similarly, Data Entry Clerks reported a high percentage (85.7%). Notably, all Data Managers (100%) and Development Partners (100%) acknowledged improvements, signifying strong confidence in the strategic plan's impact on data quality within these roles. Program Officers, while having the highest percentage of "Uncertain" responses (14.3%), still retained a majority (76.2%) affirming improvements. The P-value of 0.664 indicates no significant association between professional role and perceptions of data accuracy and consistency.

Among those with 11-20 years of experience, an impressive 90.0% reported improved accuracy and consistency. In the 5-10 years grouping, 76.9% felt similarly positive. Participants with less than 5 years of experience showed a mixed response, with half expressing uncertainty concerning improvements. Those with over 20 years of experience exhibited 88.9% positive perception, showing that longer tenured professionals generally feel that data accuracy and consistency have improved. The P-value of 0.552 indicates no significant association concerning years of experience.

**4.5 The Strategic Plan’s contribution to the completeness and utilization of health data for the decision-making process**

Table 5 indicates that the analysis of data completeness after the implementation of the Strategic Plan reveals varied perceptions across different demographic and professional groups. Among genders, 50% of females rated the data completeness as neutral, while 31% of males found it incomplete, and only a small percentage rated it as very complete. The P-value of 0.350 indicates no statistically significant difference between male and female perceptions.

Age-wise, respondents aged 31-40 had the highest percentage (37.5%) of those who found the data incomplete, while 41.7% of those above 40 rated it as somewhat complete. However, the P-value of 0.500 suggests no significant differences among the age groups.

Professionally, there is a notable variation, with 41.7% of Administrators rating the data as incomplete and neutral, while 42.9% of Data Entry Clerks and 60% of Data Managers rated it as somewhat or very complete. Program Officers were divided, with a larger portion rating it as somewhat complete. The P-value of 0.027 indicates a statistically significant difference based on professional roles, suggesting that perceptions of data completeness before the Strategic Plan's implementation vary considerably among different roles.

In terms of experience, those with 11-20 years reported a more balanced view, while those with less than 5 years had a unique perspective, with half finding the data very complete. The P-value of 0.508 indicates no significant difference based on years of experience.

**4.6Association between socio-demographic variables and the influence of Strategic Plan in the utilization of health data in decision-making**

The table 6 presents the association between socio-demographic variables and the influence of a Strategic Plan on the utilization of health data in decision-making. It categorizes the responses into three effectiveness levels: "Neutral," "Significantly improved," and "Somewhat improved." Here we will analyze the findings, identify trends, and consider their implications.

Among females, 50% reported a "significant improvement," while 41.7% reported "somewhat improved," leading to a total of 91.7% indicating some level of improvement. For males, the figures are slightly different with 35.7% reporting "significantly improved" and 52.4% "somewhat improved," totalling 88.1% showing an improvement. The p-value (0.667) indicates no significant impact of gender on perceived improvements in data utilization for decision-making.

The age group of 25-30 showed a notable trend with 83.3% reporting "significantly improved," but this is based on a small sample size (only 6 individuals). The groups aged 31-40 and above 40 have a good distribution of responses, with 62.5% and 50% respectively reporting a "somewhat improved" status, indicating positive utilization trends. The p-value (0.100) suggests marginal significance in age as a factor, particularly due to the small sample size of the younger group.

Data Entry Clerks reported the highest percentage of "significantly improved" (71.4%), which could reflect their direct involvement in data handling and entry. Program Officers also had a sizeable portion (38.1% "significantly improved") and 52.4% indicating "somewhat improved." The roles of Administrator and Development Partner show relatively lower improvement percentages. The p-value (0.522) shows no significant association between profession/role and perceived improvement in data utilization.

Regarding the years of experience in Health Service, the group with 11-20 years of experience appears to have the most positive outlook, with 40% stating significant improvements and 50% stating somewhat improved. Those with less than 5 years of experience seem to have the least positive response (50% neutral), indicating a potential gap in experience. The p-value (0.304) suggests that years of experience do not have a statistically significant effect on the perceived improvements in data utilization.

Overall, the results suggest that the Strategic Plan is positively impacting the utilization of health data in decision-making across various segments of the health sector, with a broad recognition of improvements. While there are some variations in the level of improvement perceived (e.g., data managers and program officers), the absence of statistically significant differences across gender, age, profession, and years of experience implies that the Strategic Plan's benefits are being felt relatively uniformly across different groups within the health sector.

**4.7 The challenges in implementing the Strategic Plan regarding managing and producing quality health data**

Table 7 presents data on the challenges faced during the implementation of a strategic plan, with the characteristics measured in terms of frequency and percentage of respondents who either identified (Yes) or did not identify (No) these challenges.

A significant 66.7% of respondents reported a lack of resources as a challenge. This suggests that insufficient funding and technological support are major barriers to the effective implementation of the strategic plan. The data shows that 25.9% of respondents experienced resistance from staff, while 74.1% did not identify this as a challenge. This indicates that, while staff resistance is present, it is not a widespread issue within the organization. A majority, 64.8%, reported inadequate training or capacity building as a challenge. This highlights a potential gap in skills and knowledge among staff that could hinder the execution of the strategic plan.

About 44.4% of respondents indicated inadequate support from leadership as a challenge. This suggests that while a substantial portion of the organization feels supported, there remains a notable segment that perceives a lack of engagement or backing from leadership. Nearly 59.3% of respondents acknowledged data quality issues as a challenge. This indicates a critical area requiring attention, as poor data quality can significantly impact decision-making and the overall success of the strategic plan. Finally, 55.6% reported facing regulatory or compliance barriers. This suggests that external constraints may add complexity to the implementation, requiring careful navigation to ensure adherence to relevant laws and regulations.

**4.8 Test of Hypotheses**

Based on the findings, we reject the null hypothesis (H2), which posits that the implementation of a Strategic Plan does not positively impact the management and production of quality health data in The Gambia. Instead, we accept the alternative hypothesis (H1), which asserts that the implementation of a Strategic Plan does indeed have a positive impact on the management and production of quality health data in The Gambia

**Table 1: The sociodemographic variables of the participants**

|  |  |  |
| --- | --- | --- |
| **Characteristics** | **Frequency** | **Percent** |
| Gender | | |
| Female | 12 | 22.2 |
| Male | 42 | 77.8 |
| Age | | |
| 25 – 30 | 6 | 11.1 |
| 31- 40 | 24 | 44.4 |
| Above 40 | 24 | 44.4 |
| Profession/Role in Health Sector | | |
| Administrator | 12 | 22.2 |
| Data Entry Clerk | 7 | 13.0 |
| Data Manager | 10 | 18.5 |
| Development Partner | 4 | 7.4 |
| Program Officer | 21 | 38.9 |
| Years of experience in health service |  |  |
| 11 – 20 years | 30 | 55.6 |
| 5 – 10 years | 13 | 24.1 |
| Less than 5 years | 2 | 3.7 |
| More than 20 years | 9 | 16.7 |

**Table 2: Association between sociodemographic variables and Timeliness of health data collection and reporting since the implementation of the HMIS strategic plan**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Characteristics | No change N (%) | Yes, significantly increased N (%) | Yes, significantly reduced N (%) | Yes, somewhat increased N (%) | Yes, somewhat reduced N (%) | Total N (%) | P-value |
| Gender | | | | | | | |
| Female | 2 (16.7) | 2 (16.7) | 5 (41.7) | 0 (0.0) | 3 (25.0) | 12 (22.2) | 0.342 |
| Male | 2 (4.8) | 4 (9.5) | 18 (42.9) | 8 (19.0) | 10 (23.8) | 42 (77.8) |
| Age | | | | | | | |
| 25 – 30 | 2 (33.3) | 0 (0.0) | 3 (50.0) | 1 (16.7) | 0 (0.0) | 6 (11.1) | 0.199 |
| 31- 40 | 1 (4.2) | 4 (16.7) | 8 (33.3) | 3 (12.5) | 8 (33.3) | 24 (44.4) |
| Above 40 | 1 (4.2) | 2 (8.3) | 12 (50.0) | 4 (16.7) | 5 (20.8) | 24 (44.4) |
| Profession/Role in the Health Sector | | | | | | | |
| Administrator | 1 (8.3) | 1 (8.3) | 5 (41.7) | 0 (0.0) | 5 (41.7) | 12 (22.2) | 0.113 |
| Data Entry Clerk | 1 (14.3) | 2 (28.6) | 4 (57.1) | 0 (0.0) | 0 (0.0) | 7 (13.0) |
| Data Manager | 0 (0.0) | 2 (20.0) | 4 (40.0) | 4 (40.0) | 0 (0.0) | 10 (18.5) |
| Development Partner | 0 (0.0) | 0 (0.0) | 3 (75.0) | 1 (25.0) | 0 (0.0) | 4 (7.4) |
| Program Officer | 2 (9.5) | 1 (4.8) | 7 (33.3) | 3 (14.3) | 8 (38.1) | 21 (38.9) |
| Years of experience in health service | | | | | | | |
| 11 – 20 years | 1 (3.3) | 3 (10.0) | 16 (53.3) | 5 (16.7) | 5 (16.7) | 30 (55.6) | 0.060 |
| 5 – 10 years | 2 (15.4) | 0 (0.0) | 4 (30.8) | 3 (23.1) | 4 (30.8) | 13 (24.1) |
| Less than 5 years | 1 (50.0) | 1 (50.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 2 (3.7) |
| More than 20 years | 0 (0.0) | 2 (22.2) | 3 (33.3) | 0 (0.0) | 4 (44.4) | 9 (16.7) |

**Table 3 : Association between sociodemographic variables and reliability of health data since the implementation of the strategic plan (2017)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sociodemographic Variables | About the same N(%) | Significantly better N(%) | Slightly better N(%) | Slightly worse N(%) | Total N(%) | P-Value |
| Age | | | | | | |
| 25 – 30 | 1 (16.7) | 3 (50.0) | 2 (33.3) | 0 (0.0) | 6 (11.1) | 0.152 |
| 31- 40 | 0 (0.0) | 13 (54.2) | 10 (41.7) | 1 (4.2) | 24 (44.4) |
| Above 40 | 0 (0.0) | 14 (58.3) | 10 (41.7) | 0 (0.0) | 24 (100) |
| Gender | | | | | | |
| Female | 1 (8.3) | 8 (66.7) | 3 (25.0) | 0 (0.0) | 12 (22.2) | 0.167 |
| Male | 0 (0.0) | 22 (52.4) | 19 9 (45.2) | 1 (2.4) | 42 (77.8) |
| Profession/Role in Health Sector | | | | | | |
| Administrator | 0 (0.0) | 8 (66.7) | 3 (25.0) | 1 (8.3) | 12 (22.2) | 0.159 |
| Data Entry Clerk | 1 (14.3) | 5 (71.4) | 1 (14.3) | 0 (0.0) | 7 (13.0) |
| Data Manager | 0 (0.0) | 6 (60.0) | 4 (40.0) | 0 (0.0) | 10 (18.5) |
| Development Partner | 0 (0.0) | 3 (75.0) | 1 (25.0) | 0 (0.0) | 4 (7.4) |
| Program Officer | 0 (0.0) | 8 (38.1) | 13 (61.9) | 0 (0.0) | 21 (38.9) |
| Years of experience in health service: | | | | | | |
| 11 – 20 years | 0 (0.0) | 17 (56.7) | 13 (43.3) | 0 (0.0) | 30 (56.6) | 0.000 |
| 5 – 10 years | 0 (0.0) | 6 (46.2) | 6 (46.2) | 1 (7.7) | 13 (24,1) |
| Less than 5 years | 1 (50.0) | 1 (50.0) | 0 (0.0) | 0 (0.0) | 2 (3.7) |
| More than 20 years | 0 (0.0) | 6 (66.7) | 3 (33.3) | 0 (0.0) | 9 (16.7) |

**Table 4: The association between socio-demographic variables and the accuracy and consistency of health data reported since the start of the implementation of the strategic plan in 2017**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variables | No | Uncertain | Yes | Total | P-value |
| Gender | | | | | |
| Female | 0 (0.0) | 1 (8.3) | 11 (91.7) | 12 (22.2) | 0.686 |
| Male | 2 (4.8) | 5 (11.9) | 35 (83.3) | 42 (77.8) |
| Age | | | | | |
| 25 – 30 | 0 (0.0) | 1 (16.7) | 5 (83.3) | 6 (11.1) | 0.957 |
| 31- 40 | 1 (4.2) | 3 (12.5) | 20 (83.3) | 24 (44.4) |
| Above 40 | 1 (4.2) | 2 (8.3) | 21 (87.5) | 24 (44.4) |
| Profession/Role in Health Sector | | | | | |
| Administrator | 0 (0.0) | 2 (16.7) | 10 (83.3) | 12 (22.2) | 0.664 |
| Data Entry Clerk | 0 (0.0) | 1 (14.3) | 6 (85.7) | 7 (13.0) |
| Data Manager | 0 (0.0) | 0 (0.0) | 10 (100.0) | 10 (18.5) |
| Development Partner | 0 (0.0) | 0 (0.0) | 4 (100.0) | 4 (7.4) |
| Program Officer | 2 (9.5) | 3 (14.3) | 16 (76.2) | 21 (38.9) |
| Years of experience in health service: | | | | | |
| 11 – 20 years | 1 (3.3) | 2 (6.7) | 27 (90.0) | 30 (55.6) | 0.552 |
| 5 – 10 years | 1 (7.7) | 2 (15.4) | 10 (76.9) | 13 (24.1) |
| Less than 5 years | 0 (0.0) | 1 (50.0) | 1 (50.0) | 2 (3.7) |
| More than 20 years | 0 (0.0) | 1 (11.1) | 8 (88.9) | 9 (16.7) |

**Table 5: Association between sociodemographic variables and completeness of health data after the implementation of the Strategic Plan**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Variables | Incomplete N(%) | Neutral N(%) | Somewhat complete N(%) | Very complete N(%) | Very incomplete N(%) | Total N(%) | P-value |
| Gender | | | | | | | |
| Female | 1(8.3) | 6 (50.0) | 3 (25.0) | 2 (16.7) | 0 (0.0) | 12 (22.2) | 0.350 |
| Male | 13 (31.0) | 12 (28.6) | 13 (31.0) | 3 (7.1) | 1 (2.4) | 42 (77.8) |
| Age | | | | | | | |
| 25 – 30 | 1 (16.7) | 2 (33.3) | 2 (33.3) | 1 (16.7) | 0 (0.0) | 6 (11.1) | 0.500 |
| 31- 40 | 9 (37.5) | 8 (33.3) | 4 (16.7) | 3 (12.5) | 0 (0.0) | 24 (44.4) |
| Above 40 | 4 (16.7) | 8 (33.3) | 10 (41.7) | 1 (4.2) | 1 (4.2) | 24 (44.4) |
| Profession/Role in Health Sector | | | | | | | |
| Administrator | 5 (41.7) | 5 (41.7) | 2 (16.7) | 0 (0.0) | 0 (0.0) | 12 (22.2) | 0.027 |
| Data Entry Clerk | 2 (28.6) | 2 (28.6) | 0 (0.0) | 3 (42.9) | 0 (0.0) | 7 (13.0) |
| Data Manager | 1 (10.0) | 1 (10.0) | 6 (60.0) | 2 (20.0) | 0 (0.0) | 10 (18.5) |
| Development Partner | 1 (25.0) | 3 (75.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 4 (7.4) |
| Program Officer | 5 (23.8) | 7 (33.3) | 8 (38.1) | 0 (0.0) | 1 (4.8) | 21 (38.9) |
| Years of experience in health service | | | | | | | |
| 11 – 20 years | 8 (26.7) | 11 (36.7) | 8 (26.7) | 2 (6.7) | 1 (3.3) | 30 (55.6) | 0.508 |
| 5 – 10 years | 5 (38.5) | 2 (15.4) | 4 (30.8) | 2 (15.4) | 0 (0.0) | 13 (24.1) |
| Less than 5 years | 0 (0.0) | 1 (50.0) | 0 (0.0) | 1 (50.0) | 0 (0.0) | 2 (3.7) |
| More than 20 years | 1 (11.1) | 4 (44.4) | 4 (44.4) | 0 (0.0) | 0 (0.0) | 9 (16.7) |

**Table 6: Association between socio-demographic variables and the influence of Strategic Plan in the utilization of health data in decision-making**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variables | Neutral N(%) | Significantly improved N(%) | Somewhat improved N(%) | Total N(%) | P-value |
| Gender | | | | | |
| Female | 1 (8.3) | 6 (50.0) | 5 (41.7) | 12 (22.2) | 0.667 |
| Male | 5 (11.9) | 15 (35.7) | 22 (52.4) | 42 (77.8) |
| Age | | | | | |
| 25 – 30 | 1 (16.7) | 5 (83.3) | 0 (0.0) | 6 (11.1) | 0.100 |
| 31- 40 | 2 (8.3) | 7 (29.2) | 15 (62.5) | 24 (44.4) |
| Above 40 | 3 (12.5) | 9 (37.5) | 12 (50.0) | 24 (44.4) |
| Profession/Role in Health Sector | | | | | |
| Administrator | 2 (16.7) | 3 (25.0) | 7 (58.3) | 12 (22.2) | 0.522 |
| Data Entry Clerk | 1 (14.3) | 5 (71.4) | 1 (14.3) | 7 (13.0) |
| Data Manager | 0 (0.0) | 4 (40.0) | 6 (60.0) | 10 (18.5) |
| Development Partner | 1 (25.0) | 1 (25.0) | 2 (50.0) | 4 (7.4) |
| Program Officer | 2 (9.5) | 8 (38.1) | 11 (52.4) | 21 (38.9) |
| Years of experience in health service | | | | | |
| 11 – 20 years | 3 (10.0) | 12 (40.0) | 15 (50.0) | 30 (55.6) | 0.304 |
| 5 – 10 years | 0 (0.0) | 6 (46.2) | 7 (53.8) | 13 (24.1) |
| Less than 5 years | 1(50.0) | 1(50.0) | 0 (0.0) | 2 (3.7) |
| More than 20 years | 2 (22.2) | 2 (22.2) | 5 (55.6) | 9 (16.7) |

**Table 7: Challenges in the implementation of the strategic plan**

|  |  |  |
| --- | --- | --- |
| **Characteristics** | **Frequency** | **Percent** |
| Lack of resources (e.g., funding, technology) | | |
| No | 18 | 33.3 |
| Yes | 36 | 66.7 |
| Resistance from staff members | | |
| No | 40 | 74.1 |
| Yes | 14 | 25.9 |
| Inadequate training or capacity building | | |
| No | 19 | 35.2 |
| Yes | 35 | 64.8 |
| Insufficient support from leadership | | |
| No | 30 | 55.6 |
| Yes | 24 | 44.4 |
| Data quality issues | | |
| No | 22 | 40.7 |
| Yes | 32 | 59.3 |
| Regulatory or compliance barriers | | |
| No | 24 | 44.4 |
| Yes | 30 | 55.6 |

**5. DISCUSSION**

The research findings reveal considerable diversity in perceptions regarding the timeliness of health data collection and reporting, influenced by socio-demographic variables. Notably, there appears to be a trend where many participants particularly those who are older or more experienced report perceived reductions in delay in the timeliness since the implementation of the Health Management Information System (HMIS) strategic plan. While statistical analysis shows no significant relationships between gender and age with perceptions of reduction in the delay of data timeliness, the higher percentage of reductions in delay reported by younger participants presents an important aspect in health data management. The lack of significant differences across genders suggests that systemic issues may transcend personal experiences, emphasizing the need for a broader organizational assessment rather than focusing solely on demographic variables.

A critical area of concern identified in the findings is the role within the health sector. Notably, Development Partners and Data Entry Clerks reported significant reductions in the delay in perceived timeliness. This likely reflects varying efforts by different roles in terms of data collection efficiency, highlighting the important interventions for improving data management practices, particularly in data entry and collaborative engagements with partners. Interestingly, while the p-values indicate that years of experience do not lead to significant differences in perceptions, a near-significant association suggests that more experienced professionals may be more attuned to the established systems. This insight implies that long-serving employees could be vital in improving overall data management performance.

The observed improvement in the perceived reduction in the delays of health data timeliness aligns with the findings of Johnson et al. (2018) and Patel et al. (2020), which demonstrate that strategic planning plays a crucial role in creating clear timelines and protocols for data collection. This ensures that information is gathered promptly and reported in a timely manner.

The findings provide critical insights into how socio-demographic factors relate to perceptions of health data reliability. While there is a consensus that improvements in data reliability have occurred since the strategic plan's implementation in 2017, especially among those with greater experience. Minor variations by role indicate that perceptions may depend on the specific experiences and responsibilities associated with different positions. Data Entry Clerks and Administrators, for example, exhibit more optimistic views, possibly due to their direct involvement in data operations. The lack of significant associations between gender and age with perceptions of data reliability implies that, while individuals may have varied experiences, the positive impacts of the strategic plan appear to be uniformly recognized across demographic categories. This corroborates with the research by Lee et al. (2019) and Wang et al. (2021) which suggests that strategic planning promotes the adoption of standardized data collection methods, quality assurance protocols, and data validation procedures, thereby enhancing the reliability and accuracy of health data.

Moreover, the findings suggest a broadly positive perception regarding the accuracy and consistency of health data since the strategic plan's initiation. The evidence of widespread agreement on improvements among respondents further underscores the effectiveness of the strategic plan in fostering a stronger commitment to data quality across all demographic categories. It is noteworthy that both Data Managers and Development Partners reported a 100% affirmation rate regarding improvements in data accuracy, indicating their closer involvement in data assurance processes. This result validates the Research by Lee et al. (2019) and Wang et al. (2021) that strategic planning promotes enhancing the reliability and accuracy of health data. Conversely, the uncertainty expressed by respondents with less than five years of experience may highlight the need for additional support and training to bolster their understanding and confidence in the data management practices established by the strategic plan.

Furthermore, the results indicate that most respondents perceive improvements in health data utilization for decision-making since the strategic plan's implementation. This supports the research by Ceesay et al. (2017) which demonstrated that strategic plans provide a framework for prioritizing data collection efforts, aligning data management strategies with organizational objectives, and enhancing data utilization for informed decision-making. However, while improvements are acknowledged, the lack of statistically significant associations in perceptions based on gender, age, profession, or experience suggests that these factors may not significantly influence how improvements in the utilization of health data for decision-making are perceived.

Lastly, Challenges such as inadequate funding and resources, insufficient training, limited leadership support and legislative barriers have been cited as factors hindering the management and production of quality health data. This result is aligned with the study by Smith et al. (2017) and Brown et al. (2020) which highlights common obstacles such as resistance to change, limited resources, inadequate training, and data interoperability issues. This finding underscores the necessity for adequate investments in technology and infrastructure; staff development to enhance competencies and improve strategic plan outcomes; and collaboration with legal and regulatory bodies will be essential in navigating these obstacles effectively and ensuring that the health system can operate at its full potential.

6. Conclusion

The socio-demographic composition of participants in this study is crucial for understanding findings related to health service practices and data utilization. While the group possesses significant experience, future research should aim to incorporate broader perspectives, particularly from younger professionals and women, to achieve a more comprehensive view of health data utilization and decision-making.

The research indicates a positive trend of perceived reductions in delays in the timeliness of health data collection after implementing the Health Management Information System (HMIS) strategic plan. Variability across gender, age, professional roles, and years of experience highlights the simpleness of health data management.

There is a strong consensus about the increased reliability of health data post-implementation of the strategic plan, especially among experienced professionals. Although no significant differences were found based on gender or age, variations by professional role suggest the need for tailored communication and training to ensure adherence to best practices in data reliability across all roles.

Perceptions of improvements in data accuracy and consistency have emerged since the strategic plan's implementation, indicating effective interventions resonate across diverse groups. Continuous education and involvement of less experienced team members in accuracy initiatives will enhance their engagement and competency within the health workforce.

The findings indicate that neither gender nor age significantly impacts the completeness of health data; instead, professional role is the primary determinant. Insights from this study can inform targeted strategies to improve data completeness, such as specialized training and addressing gaps in data collection processes.

While the strategic plan has enhanced decision-making based on health data, no single socio-demographic variable stands out as a significant predictor. Future initiatives should address the diverse needs of specific groups to improve engagement with health data.

Challenges remain in implementing the strategic plan, particularly regarding insufficient resources and inadequate training. Prioritizing resource allocation, enhancing training, increasing leadership engagement, and addressing data integrity and compliance issues are critical for developing effective strategies, facilitating better implementation outcomes, and achieving the strategic plan's success.

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DISCLAMER (ARTIFICIAL INTELLIGENCE)

Authors hereby declare that NO generative AI technologies such as large language models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during the writing or editing of this manuscript.

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