Effect of Training and Capacity Building on the use of Routine Health Data in Public Health Programs: Evidence from a Quasi-Experimental Study in Kenya

Joshua, M. Gitonga[1] ; Prof. John Paul Oyore[2] ; Prof. George Ochieng Otieno[3]

[123]Department of Family Medicine, Community Health and Epidemiology Kenyatta University

DOI: https://dx.doi.org/10.47772/IJRISS.2025.91100043

Received: 07 November 2025; Accepted: 14 November 2025; Published: 28 November 2025

ABSTRACT

The effective use of Routine Health Data (RHD) remains a critical yet underutilized component of health system governance in many low- and middle-income settings. This quasi-experimental study examined the impact of a structured training intervention on the capacity of County Health Management Teams (CHMTs) in Kenya to apply in public health decision-making. Twelve counties were selected across six regional blocs, with six receiving the intervention and six serving as controls. Data collected at baseline and endline using structured questionnaires were analysed using descriptive statistics, chi-square tests, and a Difference-in-Differences (DiD) model. Results showed significant improvements in analytical, interpretive, and application competencies among trained CHMT members, with a 0.45-unit increase in perceived data-use capacity relative to controls. The findings underscore that systematic capacity-building enhances data-driven decision-making and should be institutionalized within county health leadership frameworks.

Keywords-Routine health data; capacity building; data utilization; health management; decision-making; evidence-informed governance

INTRODUCTION

Background to the Study

Effective decision-making in health systems relies fundamentally on the capacity of managers to interpret and apply RHD in planning, resource allocation, and performance monitoring. Although most countries in sub-Saharan Africa have invested substantially in strengthening Health Information Systems (HIS), including the widespread adoption of digital platforms such as the District Health Information Software (DHIS2), the translation of available data into actionable decisions remains inconsistent (Nutley & Reynolds, 2013; Aqil et al., 2014). Weak analytical skills, insufficient confidence in data interpretation, and the absence of institutional incentives for evidence use have perpetuated a persistent gap between data generation and data application (Mboera et al., 2020; Nsubuga et al., 2018). Consequently, health managers often engage in routine data reporting without systematically applying information to guide decisions, undermining the potential of HIS to strengthen accountability, efficiency, and service delivery equity within public health systems.

In Kenya, the devolution of health services in 2013 shifted substantial decision-making authority to the county level, amplifying the importance of managerial competence in data analysis and use. CHMTs are central to this process, as they are responsible for transforming health information into actionable plans, budgets, and policies. However, while data reporting rates through the Kenya Health Information System (KHIS) have improved markedly, evidence indicates that county managers still face barriers to effective data use (Oluoch et al., 2020; Wako et al., 2018). These challenges stem from limited technical capacity, insufficient training in data interpretation, and weak institutional mechanisms for continuous learning (O'Meara et al., 2022). As a result, decisions in planning, supervision, and resource allocation are often based on intuition or precedent rather than empirical evidence, compromising health sector responsiveness and efficiency.

Although national policies emphasize the need for evidence-informed management, empirical studies on interventions that build CHMT members' capacity to use RHD remain limited. Few evaluations have examined how structured training influences knowledge, confidence, and analytical ability to apply data in managerial decisions. This gap underscores the need for empirical evidence on the effectiveness of capacity-building interventions in institutionalizing data-driven decision-making within Kenya's devolved health governance framework. By addressing this gap, the present study contributes to understanding how targeted training can transform data-use practices from compliance-oriented reporting into a core component of strategic and accountable health management.

Problem Statement

The strategic potential of substantial investments in HIS across sub-Saharan Africa, including the widespread adoption of digital platforms such as DHIS2, remains significantly underrealized (Mutale et al., 2013; Ndabarora et al., 2014). Effective decision-making relies on managerial capacity to interpret and apply RHD for planning, resource allocation, and performance monitoring (Nutley & Reynolds, 2013). However, a persistent and critical issue is that the generation of data has consistently outpaced the capacity to interpret and use it, weakening the translation of evidence into management actions (AbouZahr & Boerma, 2015; Nutley & Reynolds, 2013).

This challenge is keenly reflected in Kenya's devolved structure, where CHMTs are central to transforming health information into actionable plans and policies (Oluoch et al., 2020). Despite marked improvements in data reporting rates through the Kenya Health Information System (KHIS), county managers face barriers to effective data use (Oluoch et al., 2020; Wako et al., 2018). The constraints on data utilization are directly linked to managerial shortcomings like poor analytical skills and low confidence in reading data, further aggravated by the lack of institutional encouragement and systems necessary for ongoing professional development. As such, the reliance on intuition or administrative precedent frequently supersedes the use of empirical evidence in critical decisions concerning planning, supervision, and resource allocation, thereby compromising the responsiveness and efficiency of the health sector (Wako et al., 2018).

Although national policies emphasize the necessity of evidence-informed management, empirical studies evaluating the effectiveness of interventions designed to build CHMT members' capacity to use RHD remain limited (Aqil et al., 2009). Few evaluations have examined how structured training influences the specific competencies of knowledge, confidence, and analytical ability required to apply data in core managerial functions (Nsubuga et al., 2018). This gap necessitates research to demonstrate the causal effect of targeted capacity-building on data-driven decision-making. By providing empirical evidence, this study contributes to understanding how training can transform data-use practices from compliance-oriented reporting into a core component of strategic and accountable health management within Kenya's devolved governance framework.

Objective of the Study

The overall objective of this study was to assess the effect of structured training and capacity-building interventions on the ability of CHMTs to utilize RHD in making public health decisions within Kenya's devolved health system. Specifically, the study examined how training influenced CHMT members' analytical competence, interpretive capacity, and confidence in applying RHD to managerial and strategic functions.

The study was guided by the following specific objectives:

1. To examine CHMT members' ability to use RHD for public health decision-making between baseline and endline across intervention and control counties.
2. To assess the ability of CHMT members to apply RHD for decision-making across selected demographic and institutional characteristics.
3. To determine the effect of structured training and capacity-building interventions on the integration of RHD into public health decision-making among CHMTs.

The study also sought to assess the following hypotheses:

1. **H_{01}:** There is no statistically significant difference in the use of RHD for public health decision-making between intervention and control counties.
2. **H_{02}:** There are no statistically significant variations in the ability of CHMT members to apply RHD for decision-making across demographic and institutional characteristics.
3. **H_{03}:** Structured training and capacity-building interventions have no statistically significant effect on the integration of RHD into public health decision-making among CHMTs.

Significance of the Study

This study holds considerable significance for strengthening evidence-based governance within Kenya's devolved health system. By assessing how structured training interventions enhance the ability of CHMTs to interpret and apply RHD, the study provides concrete evidence of how capacity development can bridge the persistent gap between data generation and its practical use in managerial decision-making. The findings demonstrate that equipping health managers with analytical and interpretive competencies not only improves data-use practices but also promotes institutional accountability, transparency, and efficiency in public health management. Beyond its empirical contribution, the study offers strategic guidance for policymakers and development partners on how to embed data-use capacity-building into health sector reforms and leadership programs. It underscores the need for continuous professional development and system-level support to sustain data-driven decision-making practices. Further, this research contributes to the broader discourse on institutionalizing a culture of evidence-informed management within devolved governance structures.

MATERIALS AND METHODS

Study Design and Setting

The study adopted a quasi-experimental pretest–post-test design comprising intervention and control groups. This design was selected to enable assessment of how a structured capacity-building intervention influenced the ability of CHMTs to interpret and apply RHD in decision-making processes. The approach allowed comparison of changes over time between counties that received the training intervention and those that did not, thereby isolating the effect of the intervention from other contextual or temporal factors.

A total of twelve counties were purposively selected from Kenya's six regional economic blocs to ensure diversity in geography, governance structures, and health system capacity. Six counties formed the intervention group and six served as the control group. The intervention counties received a structured training program adapted from the MEASURE Evaluation data-use curriculum, customized to Kenya's devolved health governance context. The program emphasized analytical skill development, practical exercises in data interpretation, and application of evidence in real-world decision-making scenarios. Baseline data were collected prior to the training, and endline data were obtained after the intervention was rolled out.

County selection ensured regional representation across the six economic blocs. From the Lake Region Economic Bloc, Kisii served as the intervention county and Kisumu as the control; in the North Rift Economic Bloc, Uasin Gishu represented the intervention arm and Turkana the control. Within the Mt. Kenya and Aberdare Bloc, Kiambu was included as the intervention county and Meru as the control. Garissa and Marsabit were drawn from the Frontier Counties Development Council, Kilifi and Kwale from the Jumuiya ya Kaunti za Pwani, and Machakos and Makueni from the Southeastern Kenya Economic Bloc. This cross-regional composition captured counties with differing levels of infrastructure, managerial experience, and information system maturity, providing a comprehensive basis for examining how contextual diversity affects training outcomes.

Each CHMT was treated as a distinct analytical unit because it represents the institutional focal point for evidence interpretation and operational decision-making at the county level. Ethical approval for the study was obtained from a recognized Institutional Review Board, and authorization was granted by the Ministry of Health. Participation was voluntary, informed consent was obtained from all respondents, and confidentiality was maintained throughout data collection, analysis, and reporting.

Study Population and Sampling

The study targeted members of the CHMTs who hold administrative and technical positions central to health sector management within Kenya's devolved governance structure. The study population therefore comprised County Directors of Health, County Health Administrative Officers, Nursing Officers, Clinical Officers, Health Records and Information Officers, Public Health Officers, and program leads representing various functional departments. This multidisciplinary composition reflects the institutional core of county health governance, combining strategic and operational expertise necessary for evidence-based decision-making.

A combination of purposive and random sampling techniques was used to ensure both representativeness and contextual diversity. All consenting CHMT members from these counties were included, yielding a total sample of 200 participants. The sample size was determined using Cochran's (1977) formula and adjusted to accommodate potential attrition. This approach ensured balanced representation across counties while providing sufficient power to detect differences in the effects of training on data-use capacity.

Data Collection Procedures

Data were collected at two distinct points in time, baseline and endline. The baseline phase was conducted prior to the implementation of the capacity-building intervention to establish the initial conditions across both the intervention and control counties. The endline phase followed the completion of the training program and was designed to capture post-intervention outcomes in data-use practices. A structured self-administered questionnaire served as the principal tool for data collection.

Data collection was undertaken by trained research assistants under the direct supervision of the principal investigator to ensure methodological rigor and consistency. Enumerators received comprehensive instruction on research ethics, informed consent, confidentiality, and standardized administration procedures. Both the baseline and endline exercises adhered to identical procedures to maintain comparability across phases.

Data Analysis Techniques

Data were analysed using both descriptive and inferential statistical techniques in line with the study objectives. Descriptive statistics were computed to summarize the characteristics of the respondents and provide a clear overview of data-use patterns at both baseline and endline.

Inferential analysis was then conducted to examine whether the observed differences in data-use practices between intervention and control counties, as well as across time, were statistically significant. The chi-square test was applied to determine associations between key variables and to evaluate variations across demographic and institutional characteristics such as gender, education level, tenure, and age. To estimate the causal impact of the capacity-building intervention, a Difference-in-Differences (DiD) regression model was employed. This approach compared the magnitude of change between baseline and endline in both groups, using the control counties as a counterfactual to isolate the net effect of the training.

RESULTS

The study sought to assess the effect of targeted training and capacity-building interventions on the ability of CHMTs to utilize RHD in decision-making. Using baseline and endline observations from intervention and control counties, the results trace both descriptive patterns and inferential relationships to determine whether structured capacity strengthening led to measurable improvements in data-driven management. In doing so, the findings illuminate the extent to which professional development initiatives can transform managerial practice from routine data reporting toward sustained, evidence-based governance within Kenya's devolved health system.

Socio-Demographic Characteristics of Respondents

Table 1 presents the socio-demographic and professional characteristics of CHMTs members who participated in the study during both the baseline and endline assessments.

Table 1: Socio-Demographic Characteristics of Respondents

Variable	**Category**	**Baseline**		**Endline**	
		Intervention	**Control**	**Intervention**	**Control**
Total Respondents	47.1% (90)	52.9% (101)	46.6% (89)	53.4% (102)	
Age	20 - 29 Years	1.6% (3)	4.7% (9)	1.6% (3)	4.7% (9)
	30 - 39 Years	5.8% (11)	11% (21)	5.2% (10)	11% (21)
	40 - 49 Years	25.1% (48)	21.5% (41)	25.1% (48)	21.5% (41)
	50 Years and Above	14.7% (28)	15.7% (30)	14.7% (28)	16.2% (31)
Gender	Male	24.6% (47)	29.8% (57)	25.1% (48)	29.8% (57)
	Female	22.5% (43)	23% (44)	21.5% (41)	23.6% (45)
Education Level	Diploma Certificate	4.7% (9)	9.4% (18)	4.7% (9)	9.4% (18)
	Master's Degree	13.6% (26)	15.2% (29)	13.6% (26)	15.2% (29)
	PhD	0.5% (1)	2.6% (5)	0.5% (1)	2.6% (5)
		28.3% (54)	25.7% (49)	27.7% (53)	26.2% (50)
CHMT Membership Duration	Less than 1 year	5.8% (11)	5.8% (11)	5.8% (11)	6.8% (13)
	2-5 years	26.7% (51)	24.1% (46)	25.7% (49)	26.2% (50)
	6-9 years	8.4% (16)	11% (21)	8.9% (17)	9.4% (18)
	10 years and above	6.3% (12)	12% (23)	6.3% (12)	11% (21)

The composition of respondents revealed a balanced gender representation, with males constituting approximately 55% and females 45% of participants across both time points. Most respondents were aged between 40 and 49 years (around 47%), indicating that the study engaged primarily mid-career health managers with substantial professional experience. Educational attainment was notably high, with over half of the respondents holding undergraduate qualifications and nearly one-third possessing master's degrees, reflecting a technically proficient managerial workforce. Only a small proportion held diploma or doctoral-level credentials, collectively underscoring an academically well-prepared cohort.

Descriptive Statistics on Data Use for Common Public Health Decisions

The descriptive analysis examined how the structured training intervention influenced CHMT members' self-assessed capacity to analyse, interpret, and apply RHD, comparing mean agreement scores between baseline and endline across intervention and control counties.

Table 2: Mean Change in Perceived Impact of Training on Routine Health Data Utilization

Variable	Baseline			Endline		
	Intervention	Control	Overall	Intervention	Control	Overall
Training has enhanced my analytical skills and ability to effectively utilize RHD for decision-making.	3.67 (0.98)	3.66 (1.00)	3.66 (0.99)	4.15 (0.68)	3.59 (1.01)	3.85 (0.91)
Through training, I have gained skills in setting targets, calculating program coverage, and assessing service utilization using RHD.	3.66 (1.01)	3.68 (0.95)	3.67 (0.97)	4.03 (0.68)	3.65 (0.96)	3.83 (0.86)
The training has improved my capacity to interpret, present, and communicate insights from RHD to stakeholders.	3.61 (0.98)	3.71 (0.86)	3.66 (0.92)	4.17 (0.73)	3.69 (0.86)	3.91 (0.83)
I am better equipped to identify and address data quality issues in RHD as a result of the training.	3.53 (1.03)	3.61 (0.89)	3.58 (0.96)	3.97 (0.70)	3.63 (0.90)	3.79 (0.83)
I have successfully applied the skills and knowledge gained from the training to improve my use of RHD in my daily work within the CHMT.	3.64 (0.99)	3.76 (0.92)	3.71 (0.95)	3.91 (0.78)	3.75 (0.92)	3.82 (0.86)
Training has enhanced my analytical skills and ability to effectively utilize RHD for decision-making.	3.60 (0.90)	3.70 (0.87)	3.65 (0.88)	3.92 (0.61)	3.66 (0.88)	3.78 (0.78)
Impact of Training Overall	3.62 (0.90)	3.69 (0.79)	3.66 (0.84)	4.03 (0.51)	3.66 (0.76)	3.83 (0.68)

At baseline, the overall pattern across both study arms reflected moderate to high self-assessed competency in key data-use domains, suggesting that CHMT members already possessed a foundational level of analytical and managerial experience. However, the endline data revealed a marked divergence between intervention and control counties. Respondents from intervention counties consistently recorded higher mean scores across all assessed variables, reflecting substantial improvements in core data competencies.

In contrast, the control counties showed either negligible changes or marginal declines in comparable indicators. This suggests that the observed improvements were directly associated with the structured training rather than broader system-wide effects or external factors, demonstrating that the capacity-building initiative enhanced CHMT members' practical engagement with RHD.

The graphical analysis presents a comparative overview of how the training intervention influenced the perceived capacity of CHMTs to utilize RHD in decision-making. Figure 1 displays the distribution of respondents across low, moderate, and high levels of perceived training impact, while Figure 2 illustrates the corresponding changes in average index scores.

Figure 1: Change in Levels of Perceived Impact of Training on Routine Health Data Utilization

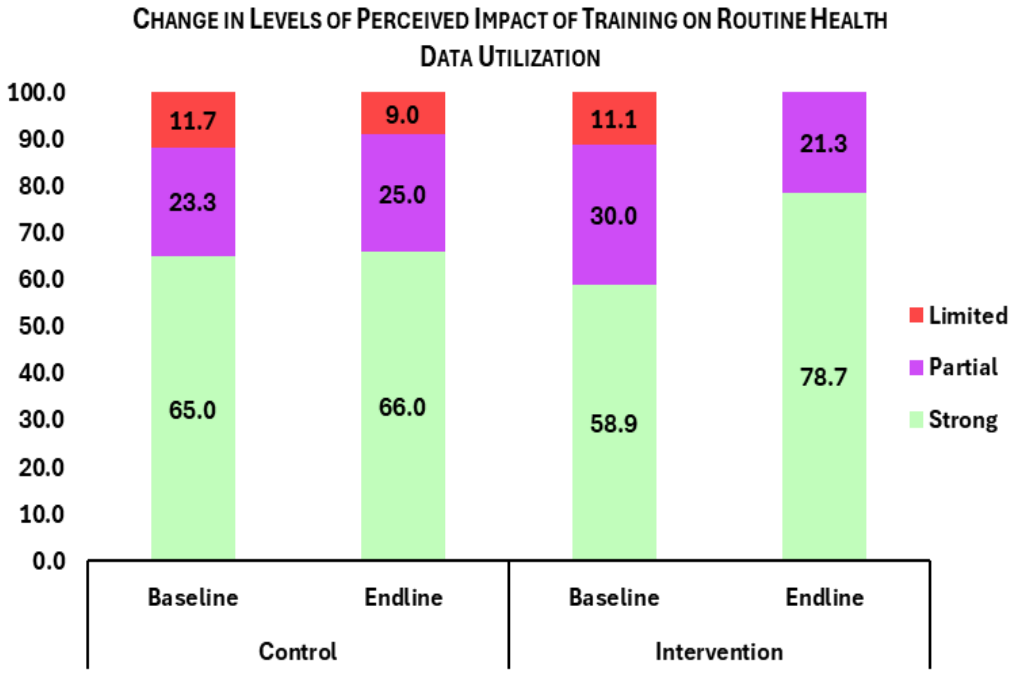
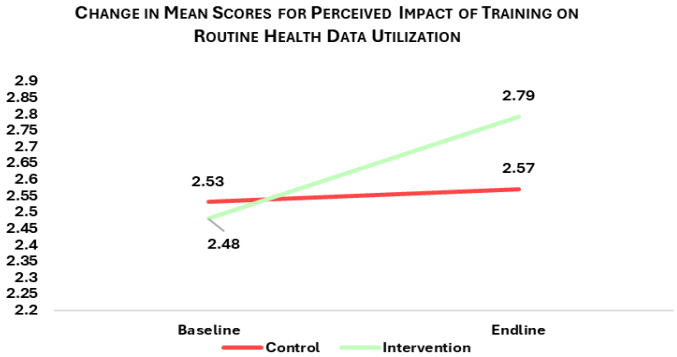


Figure 2: Change in Overall Mean Scores for Perceived Impact of Training on Routine Health Data Utilization



As shown in Figure 1, perceptions among respondents in the control counties remained relatively stable across the study period. The distribution of responses across the moderate and low categories showed minimal variation, indicating that in the absence of formal training, perceptions of capacity did not evolve significantly.

In contrast, the intervention counties exhibited a clear upward movement (Figure 2). This shift suggests that the structured training program helped transform participants' self-assessed ability to interpret and apply data in their operational contexts, promoting greater uniformity and confidence in data-use capability.

Inferential Statistics

Inferential analysis was undertaken to determine whether the training intervention led to statistically meaningful changes in the perceived ability of CHMTs to utilize RHD for decision-making. Chi-square tests were first applied to evaluate differences across time, between study arms, and across demographic and institutional characteristics. This approach addressed the first two study objectives by examining temporal and cross-sectional patterns in perceived training impact.

Table 3: Chi-square Test for Perceived Impact of Training on Routine Health Data Utilization

Comparison	N	$\chi 2$	df	p-value
Control: Baseline vs Endline	203	0.41	2	0.814
Intervention: Baseline vs Endline	179	13.7	2	<0.001
Baseline: Control vs Intervention	193	1.12	2	0.571
Endline: Control vs Intervention	189	9.33	2	0.008
Control vs Intervention by gender	382	6.38	4	0.172
Control vs Intervention by Education Level	381	5.57	7	0.591
Control vs Intervention by Duration CHMT Membership	382	9.66	8	0.290
Control vs Intervention by Age	382	8.51	8	0.385

The chi-square results demonstrated that the observed changes were concentrated in the intervention counties. The control group showed no significant difference between baseline and endline, validating the stability of perceptions in the absence of training. Conversely, the intervention group reported a statistically significant shift ($p < 0.001$), confirming a measurable program effect. Furthermore, while the two study arms were comparable at baseline, a clear and significant divergence had emerged by endline ($p = 0.008$), reflecting the successful elevation of perceived data utilization competence among trained CHMT members. Analysis across demographic and institutional variables indicated that the intervention's benefit was inclusive. None of the subgroup comparisons, including gender, education level, tenure, or age, yielded statistically significant results.

To further isolate the causal influence of the training intervention, a Difference-in-Differences (DiD) regression model was employed as shown below.

Table 4: DiD Regression Results for Impact of Training RHD Utilization

Term	Estimate	Std. Error	t-value	p-value	95% CI (Lower, Upper)
Intercept (Control Baseline)	3.6871	0.0766	48.15	<0.001	[3.5366, 3.8377]
Intervention (Baseline Difference)	-0.0649	0.1116	-0.58	0.5610	[-0.2842, 0.1544]
Post (Time Effect in Control)	-0.0283	0.1080	-0.26	0.7935	[-0.2407, 0.1841]
Intervention × Post (Treatment Effect)	0.4510	0.1578	2.86	0.0045	[0.1407, 0.7613]

The regression results revealed a significant treatment effect ($\beta = 0.4510$, $p = 0.0045$), demonstrating that the training intervention increased CHMT members' mean perception of data utilization capacity by nearly half a point on the five-point scale compared to the control group. This effect remained statistically robust after controlling for baseline differences and time-related changes. The magnitude of the treatment effect indicates that participation in the training substantially enhanced participants perceived analytical skills, data interpretation capabilities, and confidence in applying data for operational and strategic decision-making.

The chi-square and DiD findings provide strong empirical support for the effectiveness of structured training in strengthening data-use capacity among county health managers. These results underscore the importance of

continuous capacity development in institutionalizing a culture of data-driven governance, where evidence informs decision-making as a routine managerial practice.

DISCUSSION

Interpretation of Findings

The results of this study demonstrate that targeted training interventions significantly improved the ability of CHMTs to utilize RHD in decision-making. Participants in the intervention counties showed a consistent shift toward structured and purposeful data use across key managerial domains, including planning, budgeting, monitoring, and policy formulation. This pattern represents a transition from compliance-oriented data handling to an institutional culture where evidence guides administrative judgment. The observed changes were not limited to technical proficiency but extended to the normalization of analytical thinking within county health leadership. Importantly, the effects were consistent across demographic and professional subgroups, indicating that the intervention fostered an inclusive transformation rather than benefiting a specific cadre. These findings illustrate that deliberate and well-designed training can reposition RHD from a passive reporting tool to a resource for accountability, performance improvement, and strategic management within devolved health systems.

Comparison with Existing Literature

The findings of this study are consistent with global and regional evidence demonstrating that institutional capacity enhancement is central to promoting the use of health data for decision-making. Nutley and Reynolds (2013) emphasize that investments in HIS yield tangible results only when they are accompanied by interventions that empower decision-makers to interpret and apply data effectively. Similarly, Aqil et al. (2014) found that structured mentorship and data-use training were critical in closing the gap between information availability and actual utilization in public health programs. Comparable evidence from Uganda and Tanzania also confirms that decision-support training leads to measurable improvements in evidence-based planning and supervision (Nsubuga et al., 2018; Mboera et al., 2020). The uniform improvements across gender, education, and tenure observed in this study align with the argument advanced by Hotchkiss et al. (2012), who assert that sustained data use is primarily shaped by institutional systems and leadership practices rather than individual attributes. Collectively, these parallels reinforce that data utilization improves most where technical training is coupled with organizational reinforcement and accountability mechanisms.

Implications for County Health Governance

The outcomes of this study have significant implications for the strengthening of county health governance in Kenya. The demonstrated gains highlight the importance of embedding structured training and mentorship within routine management systems to institutionalize data-informed decision-making. Integrating continuous learning on data interpretation, performance analysis, and feedback mechanisms into county health leadership development programs would ensure that these improvements are sustained beyond the life of specific projects. Counties should also establish routine data review and learning forums where managers collectively examine trends, reflect on progress, and adjust plans based on emerging evidence. Such platforms can promote transparency and encourage the practical application of data in resource allocation, program monitoring, and service delivery optimization.

CONCLUSION AND RECOMMENDATIONS

Summary Of Conclusions

This study concludes that structured training and capacity-building initiatives play a pivotal role in strengthening the ability of CHMTs to interpret and apply RHD in managerial decision making. The findings demonstrated that participants who underwent targeted training showed measurable gains in analytical proficiency, confidence in data interpretation, and capacity to communicate evidence for action. These improvements were reflected in higher mean scores and statistically significant differences between

intervention and control counties, confirming that deliberate, skills-focused interventions can shift institutional behaviour toward more consistent data use. By equipping health managers with the technical and conceptual tools needed to transform data into actionable insight, the intervention contributed to building a foundation for evidence-informed governance within Kenya's devolved health system. The study therefore establishes that capacity development is not an ancillary activity but a central enabler of effective and accountable public health management.

Policy and Practice Recommendations

The results of this study highlight the need to institutionalize training for data-driven decision making as a routine component of health sector management. The Ministry of Health, in partnership with county governments, should embed structured training on data analytics, interpretation, and application within the professional development frameworks of CHMT members and other health managers. Counties should develop mentorship mechanisms and peer-learning platforms where newly acquired competencies can be continuously reinforced through practice and collaborative reflection. Furthermore, regular performance review sessions that integrate data analysis into planning and supervision processes should be mandated to ensure that data use becomes an ingrained managerial habit. Investments in supportive infrastructure, such as functional digital systems, reliable data repositories, and analytical tools, will further enhance the practical utility of training outcomes. By aligning managerial capacity with system readiness, counties can sustain a culture where training translates directly into improved performance and informed health sector governance.

Suggestions for Further Research

Future research should investigate the mechanisms through which training influences the long-term institutionalization of data use in county health systems. Longitudinal studies are needed to determine whether the observed improvements in analytical and interpretive skills lead to measurable gains in service delivery, efficiency, and equity. Additional qualitative studies could explore how mentorship, leadership engagement, and organizational culture mediate the relationship between training and sustained practice. Comparative analyses across different cadres of health managers and sectors could also reveal contextual factors that either enable or constrain the translation of skills into action.

ACKNOWLEDGMENT

The author sincerely acknowledges the unwavering guidance and mentorship of Prof. John Paul Oyore from the Department of Family Medicine, Community Health and Epidemiology, and Prof. George Otieno from the Department of Health Management and Informatics, both of Kenyatta University. Their intellectual support, constructive feedback, and commitment throughout the research process were instrumental in shaping the study's direction and rigor. The author also extends appreciation to the County Health Management Teams who participated in the study for their time, insights, and invaluable contribution to advancing evidence-based decision-making within Kenya's devolved health system.

REFERENCES

1. AbouZahr, C., & Boerma, T. (2015). Health information systems: The foundations of public health. Bulletin of the World Health Organization, 83(8), 578–583. https://doi.org/10.2471/BLT.04.019695
2. Aqil, A., Lippeveld, T., & Hozumi, D. (2009). PRISM framework: A paradigm shift for designing, strengthening, and evaluating routine health information systems. Health Policy and Planning, 24(3), 217–228. https://doi.org/10.1093/heapol/czn021
3. Braa, J., Heywood, A., & Sahay, S. (2012). Improving quality and use of data through data-use workshops: Zanzibar, United Republic of Tanzania. Bulletin of the World Health Organization, 90(5), 379–384. https://doi.org/10.2471/BLT.11.099580
4. Cibulskis, R. E., & Hiawalyer, G. (2017). Information systems for health sector monitoring and evaluation. Bulletin of the World Health Organization, 80(11), 904–908.
5. Cochran, W. G. (1977). Sampling techniques (3rd ed.). John Wiley & Sons.

6. Dolea, C., Stormont, L., & Braa, J. (2014). Strengthening capacity for evidence-based health information system development in low-income countries. Journal of Health Informatics in Developing Countries, 8(1), 1–13.
7. Gimbel, S., Mwanza, M., Nisingizwe, M. P., Michel, C., Hirschhorn, L., & Gloyd, S. (2017). Improving data quality across health systems: A case study of data verification in Mozambique. Global Health: Science and Practice, 5(3), 456–468. https://doi.org/10.9745/GHSP-D-16-00311
8. Githinji, S., Oyando, R., Malinga, J., & Odhiambo, G. (2020). Strengthening county health information systems: Lessons from Kenya's experience. African Health Sciences, 20(2), 982–990. https://doi.org/10.4314/ahs.v20i2.40
9. Government of Kenya. (2015). Kenya Health Policy 2014–2030. Ministry of Health.
10. Hotchkiss, D. R., Diana, M. L., & Foreit, K. G. (2012). How can routine health information system data improve health systems functioning in low-resource settings? BMC Health Services Research, 12(1), 11–21. https://doi.org/10.1186/1472-6963-12-11
11. Kenya Ministry of Health. (2021). Kenya Health Information System (KHIS) Annual Performance Report 2020–2021. Ministry of Health.
12. Mboera, L. E. G., Rumisha, S. F., Mbata, D., Mremi, I. R., Lyimo, E. P., & Joachim, C. (2020). Data utilisation and factors influencing the performance of health information systems in Tanzania. BMC Health Services Research, 20, 537. https://doi.org/10.1186/s12913-020-05313-2
13. MEASURE Evaluation. (2018). The Data Use Partnership: Lessons from building a culture of data use. University of North Carolina at Chapel Hill.
14. Ministry of Health. (2018). Kenya Health Sector Strategic and Investment Plan (KHSSP) 2018–2023. Nairobi: Government of Kenya.
15. Muinga, N., Paton, C., & English, M. (2018). E-Health in Kenya: Current status and future prospects. Pan African Medical Journal, 29(1), 1–9. https://doi.org/10.11604/pamj.2018.29.1.15285
16. Mutale, W., Chintu, N., Amoroso, C., Awoonor-Williams, K., Phillips, J., Baynes, C., ... & the Population Health Implementation and Training (PHIT) Partnerships. (2013). Improving health information systems for decision-making across five sub-Saharan African countries: Implementation strategies from the African Health Initiative. BMC Health Services Research, 13(Suppl 2), S9. https://doi.org/10.1186/1472-6963-13-S2-S9
17. Ndabarora, E., Chipps, J., & Uys, L. (2014). Systematic review of health data quality management and factors influencing data quality in sub-Saharan Africa. BMC Health Services Research, 14, 440. https://doi.org/10.1186/1472-6963-14-440
18. Nsubuga, P., Nwanyanwu, O., Nkengasong, J., Mukanga, D., & Trostle, M. (2018). Strengthening public health laboratories in Africa: The role of training and mentoring programs. African Journal of Laboratory Medicine, 7(1), 1–5. https://doi.org/10.4102/ajlm.v7i1.772
19. Nutley, T., & Reynolds, H. W. (2013). Improving the use of health data for health system strengthening. Global Health Action, 6(1), 20001. https://doi.org/10.3402/gha.v6i0.20001
20. Nutley, T., McNabb, S., & Salentine, S. (2014). Impact of organizational culture on the use of health information for decision-making. Health Policy and Planning, 29(8), 924–935. https://doi.org/10.1093/heapol/czt077
21. O'Meara, W. P., Tsofa, B., Molyneux, S., & Goodman, C. (2022). Strengthening data use for decision-making: Learning from the health system in Kenya. Health Policy and Planning, 37(8), 909–917. https://doi.org/10.1093/heapol/czac054
22. Ochieng, C. A., Muga, M., & Nyikal, J. (2019). Utilization of routine health data for decision-making among health managers in Kisumu County, Kenya. Pan African Medical Journal, 33(1), 1–8. https://doi.org/10.11604/pamj.2019.33.1.14434
23. Oluoch, T., Katana, A., Kwaro, D., Santas, X., Langat, P., Mwalili, S., ... & Odhiambo-Otieno, G. (2020). Implementation of the Kenya Health Information System: Progress, challenges, and opportunities. BMC Health Informatics and Decision Making, 20, 69. https://doi.org/10.1186/s12911-020-1083-3
24. Scott, K. W., & Mars, M. (2015). Health information systems and decision-making: What do we know? Journal of Public Health Informatics, 7(1), 1–10. https://doi.org/10.5210/ojphi.v7i1.5698
25. Tuti, T., Bitok, M., Malla, L., Paton, C., Muinga, N., Gathara, D., & English, M. (2016). Improving documentation of clinical care within a clinical information network: An essential initial step in

improving quality of care in Kenyan hospitals. BMJ Global Health, 1(1), e000028. https://doi.org/10.1136/bmjgh-2016-000028

26. Wako, E., Were, M., & Odhiambo-Otieno, G. (2018). Factors affecting the use of routine health information for decision-making in Kenya. East African Medical Journal, 95(10), 1712–1723.
27. World Health Organization. (2017). Monitoring the building blocks of health systems: A handbook of indicators and their measurement strategies. Geneva: WHO Press.
28. Yoon, S. J., & Kim, J. H. (2021). Health information systems strengthening and data use for decision-making: A systematic review of implementation outcomes in sub-Saharan Africa. Health Policy and Technology, 10(4), 100584. https://doi.org/10.1016/j.hlpt.2021.100584