

INFLUENCE OF BORDER CONTROL MEASURES ON COUNTER-TERRORISM STRATEGIES IN SELECTED AIRPORTS IN KENYA

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ABSTRACT

Purpose of the study: The study assessed the effect of border control measures on counter-terrorism strategies at Jomo Kenyatta International Airport, Moi International Airport and Wilson Airport in Kenya.

Short introduction of problem statement: Although Kenya has introduced biometric identification, surveillance technologies, checkpoint controls, and multi-agency security arrangements, persistent weaknesses in intelligence sharing, resource capacity, and coordination across entry points continue to expose the aviation sector to terrorist infiltration risks. The limited objective-specific evidence on the effectiveness of these measures within airport operations created the need for empirical assessment.

Method/methodology: The study adopted a convergent parallel mixed-methods design. The target population comprised 1,785 personnel from immigration, aviation security, and counter-terrorism agencies, from whom 327 respondents were selected through stratified random sampling, while senior officials were purposively selected for interviews. The quantitative analysis for this objective used 160 cases, and qualitative evidence was obtained from ten senior officials. Data were collected through a structured questionnaire and an interview guide, analyzed using descriptive statistics, correlation, regression and thematic analysis.

Results of the study: Border control measures recorded a high overall perception score, with item means ranging from 3.95 to 4.41. Respondents particularly affirmed security checkpoint protocols, personnel training, biometric identification, and integration of security agencies. Border control measures had a strong positive correlation with counter-terrorism strategies ($r = .780$, $p < .001$) and explained 60.9% of the variance in the bivariate model, $F(1, 158) = 245.586$, $p < .001$. When the other immigration policy dimensions were controlled, border control measures remained the strongest predictor ($B = .443$, $\beta = .407$, $t = 6.94$, $p < .001$). Interviews confirmed that technology improved threat detection but also identified delayed intelligence sharing, porous borders, and resource constraints as continuing challenges.

Conclusion: Effective border control measures substantially strengthen threat identification, unauthorized entry prevention, and coordinated aviation security responses.

Recommendations: The Government of Kenya should prioritize integrated border management, real-time intelligence exchange, continuous personnel training, and sustained investment in biometric and surveillance infrastructure across all entry points.

Keywords: *border control measures, counter-terrorism strategies, aviation security, biometric identification, intelligence sharing, Kenya*

INTRODUCTION

Airports are critical national infrastructures because they facilitate international mobility, trade, tourism, and diplomatic engagement while also presenting attractive targets for transnational terrorist networks. Contemporary counter-terrorism strategies therefore rely on border control measures that combine checkpoint protocols, travel document verification, surveillance, biometric identification, passenger information analysis, and intelligence-led risk assessment. Global reductions in aviation-related terrorist incidents have been associated with the strengthening of immigration and aviation security controls, although significant risks remain in jurisdictions where institutional capacity and border governance are weak (Global Terrorism Database [GTD], 2022; Levi & Wall, 2021). Border control consequently operates as both a preventive security mechanism and an early-warning system for identifying individuals, movements, and travel patterns that may present threats to civil aviation.

In Africa, the effectiveness of border control is shaped by extensive land boundaries, uneven technological capacity, resource constraints, and the cross-border character of extremist organizations. Countries facing transnational terrorism have increasingly deployed biometric systems, electronic passenger screening, surveillance technologies, and specialized border

units to reduce unauthorized movement and improve threat detection (Hassan, 2021). Nevertheless, porous boundaries and inconsistent coordination among security institutions continue to create opportunities for terrorist infiltration, illicit movement, and identity fraud. These regional challenges demonstrate that the presence of formal border control policies does not automatically guarantee operational effectiveness unless infrastructure, personnel, information systems, and inter-agency cooperation function together.

Kenya remains exposed to terrorist threats associated principally with Al-Shabaab and other networks operating within the Horn of Africa. The country has responded by strengthening airport security, introducing advanced passenger information systems, expanding biometric surveillance, and promoting multi-agency security operations at major entry points (Botha, 2020; Pulselive Kenya, 2023). Jomo Kenyatta International Airport, Moi International Airport, and Wilson Airport are particularly important because they handle large volumes of international, regional, and domestic movements and constitute strategic gateways to Kenya. Their economic and security significance requires border control systems that can detect fraudulent identities, prevent unauthorized access, identify persons on watch lists, and support rapid responses to emerging threats.

Kenya's aviation security framework has also benefited from collaboration among the Kenya Civil Aviation Authority, immigration authorities, airport security personnel, intelligence agencies, and international partners. Multi-agency arrangements and the adoption of international aviation security standards have improved screening, coordination, and institutional preparedness at major airports (Kenya Civil Aviation Authority, 2023; Nyatichi, 2020). However, the practical effectiveness of border control measures remains dependent on the quality of surveillance systems, the reliability of biometric databases, the timeliness of intelligence exchange, and the competence of frontline personnel. This study therefore isolated the second objective of the wider research and assessed how border control measures influence counter-terrorism strategies in selected airports in Kenya.

STATEMENT OF THE PROBLEM

In an effective aviation security system, border control measures should identify high-risk travellers before entry, prevent unauthorized access to restricted areas, verify passenger identities, and facilitate rapid intelligence-led intervention. Kenya has invested in biometric identification, surveillance technologies, checkpoint controls, and multi-agency coordination in response to persistent terrorist threats. These interventions should ideally reduce

opportunities for terrorist movement and protect airport users, aircraft, and critical infrastructure. The continued existence of delayed intelligence sharing, uneven technological capacity, resource limitations, and porous non-airport entry points, however, suggests that the security value of existing measures may not be fully realized (Botha, 2020; National Counter Terrorism Centre [NCTC], 2024).

The challenge is particularly important at Jomo Kenyatta International Airport, Moi International Airport, and Wilson Airport because weaknesses in any part of the national border system may ultimately affect aviation security. Terrorist actors may exploit fraudulent travel documents, identity gaps, poorly coordinated checkpoints, or weaknesses at land and sea borders before attempting to use airport networks. Although prior studies have addressed border surveillance, immigration management, and multi-agency security in other settings, limited quantitative evidence has established the magnitude and statistical significance of the relationship between border control measures and counter-terrorism strategies within Kenya's airport environment (Adeyemi & Nwosu, 2021; Mensah & Boateng, 2022; Dido *et al.*, 2022). This study addressed that contextual and methodological gap by combining survey evidence, interviews with senior officials, and inferential analysis focused specifically on selected Kenyan airports.

RESEARCH OBJECTIVE

To assess the effect of border control measures on counter-terrorism strategies at selected airports in Kenya.

THEORETICAL REVIEW

Realism Theory

Realism theory explains security policy through the state's primary responsibility to preserve sovereignty, territorial integrity, and national survival within an international system that lacks a central authority. States are therefore expected to develop defensive institutions and exercise control over borders because they cannot delegate their ultimate security obligations to external actors (Waltz, 1979; Mearsheimer, 2001). From this perspective, airport border controls are instruments through which Kenya protects its territory and citizens by regulating entry, identifying potentially dangerous persons, and restricting movement that may threaten national security. Investment in surveillance, checkpoint enforcement, biometric verification, and

specialized border personnel consequently reflects a rational state response to the possibility of transnational terrorism.

Realism is relevant to the present study because it links the effectiveness of border governance to the state's capacity to deter, detect, and respond to security threats. Strong border controls improve the ability of authorities to exercise sovereign control over movement through critical aviation gateways, while weak controls create vulnerabilities that non-state armed actors can exploit. The theory also helps explain why national security institutions prioritize information gathering, intelligence cooperation, and operational readiness even when such measures require substantial financial and administrative resources. Its limitation is that it may understate the importance of human rights, institutional culture, technology governance, and public legitimacy in shaping how security measures are implemented.

Securitization Theory

Securitization theory argues that issues become security priorities when political and institutional actors frame them as existential threats that require exceptional attention and intensified intervention. Immigration and cross-border mobility may therefore be transformed from routine administrative matters into national security concerns when they are associated with terrorism, organized crime, or threats to critical infrastructure (Buzan *et al.*, 1998). In the aviation context, this framing legitimizes enhanced passenger screening, biometric identification, predictive risk assessment, integrated databases, and stronger control of entry and exit points. The theory thus clarifies why airport border management is increasingly embedded within broader counter-terrorism strategies rather than treated only as an immigration service.

The theory is useful in interpreting the study because it connects institutional perceptions of terrorist risk with the expansion of border technologies and coordinated security practices. It also draws attention to the need for safeguards because security-driven border controls can generate privacy concerns, profiling risks, and excessive restrictions when oversight is weak. Effective securitization should therefore combine strong security measures with legal accountability, procedural fairness, and accurate intelligence. In this study, securitization complements realism by explaining both the state's security motivation and the policy processes through which border control becomes a central component of aviation counter-terrorism.

EMPIRICAL REVIEW

Chandler (2025) examined predictive travel surveillance systems at Amsterdam's Schiphol Airport and highlighted the growing use of Passenger Name Record algorithms to profile travellers and identify potential threats. The study showed that predictive systems can improve anticipatory security by directing attention to unusual travel patterns and high-risk passengers. It also raised concerns about data quality, privacy, transparency, and algorithmic bias, demonstrating that technology must operate within clear regulatory and oversight frameworks.

Lee and Chen (2023) investigated maritime border controls in Southeast Asia using indicators such as patrol frequency, interception rates, and surveillance technology. Their findings indicated that advanced monitoring and increased patrols reduced unauthorized entry, although the complexity and scale of borders continued to constrain complete control. The study confirms that technology and enforcement intensity can strengthen border security, but its maritime focus limits direct application to airport operations.

Adeyemi and Nwosu (2021) assessed border security challenges in Nigeria and found that porous borders, insufficient security personnel, and smuggling networks facilitated the movement of terrorist elements. Their qualitative findings emphasized that formal policies remain ineffective when operational capacity, personnel deployment, and monitoring are inadequate. The study offers an important African perspective, but it did not quantify the extent to which border control measures predict security outcomes.

Mensah and Boateng (2022) explored multi-agency collaboration in Ghanaian aviation security and concluded that well-designed policies were constrained by resource shortages and weak coordination among security agencies. Their findings underscore the importance of institutional integration, information exchange, and adequate resource allocation in implementing border control measures. Although the study provides a useful regional comparison, the security and institutional context differs from Kenya's exposure to cross-border threats associated with the Horn of Africa. Dido *et al.* (2022) examined border security and counter-terrorism in the Liboi border area of Mandera County, Kenya. The study found that inter-agency coordination, reduced access to illegal arms, and cross-border cooperation contributed to a decline in terrorist incidents. These findings show that coordinated border management can generate tangible security benefits within Kenya.

The NCTC (2024) reported that Kenya had expanded investments in biometric surveillance, border monitoring, and cyber intelligence in response to cross-border terrorism. These

investments demonstrate national recognition that contemporary border security requires integrated technological and intelligence capabilities. Nevertheless, institutional reports primarily describe interventions and do not necessarily evaluate their statistical contribution to aviation security outcomes. The reviewed literature collectively supports the proposition that border control measures enhance national and aviation security, but three gaps remain. First, much of the evidence is drawn from Europe, Asia, West Africa, or land and maritime borders rather than Kenyan airports. Second, several studies use qualitative or policy analysis approaches and provide limited inferential evidence regarding the strength of the relationship between border controls and counter-terrorism outcomes.

RESEARCH METHODOLOGY

The study adopted a convergent parallel mixed methods design combining quantitative and qualitative approaches within a cross sectional descriptive framework. The target population comprised 1,785 immigration officers, aviation security personnel, and NCTC or APS officers stationed at Jomo Kenyatta International Airport, Moi International Airport, and Wilson Airport, from whom a sample of 327 respondents was selected using Yamane's formula, proportionate stratified random sampling, and purposive sampling for key informants. Quantitative data were collected using structured questionnaires, while qualitative data were obtained through interviews with selected senior officials and departmental heads. Quantitative data were analysed using SPSS version 27 through frequencies, percentages, means, standard deviations, Pearson correlation and multiple linear regression at a 5 percent significance level. Qualitative data were analysed thematically and integrated with the quantitative findings through triangulation, while informed consent, confidentiality, anonymity, voluntary participation, secure data storage, and ethical approval were observed throughout the study

RESULTS AND DISCUSSIONS

The results and discussions are presented in sections.

Response Rate and Demographic Characteristics

The study distributed 327 questionnaires and received 252 completed responses, producing an overall response rate of 77.1 percent. Aviation security personnel recorded the highest response rate at 78.0 percent, followed by immigration officers at 76.3 percent and NCTC or APS officers at 72.0 percent. Since all categories achieved response rates above 70 percent, the data were considered adequate for analysis and sufficiently representative of the target population.

The high participation level also reduced the likelihood of nonresponse bias and strengthened the reliability and credibility of the study findings.

Regarding demographic characteristics, 91 respondents or 56.9 percent were male, while 69 respondents or 43.1 percent were female, indicating relatively balanced gender representation with slight male dominance. Most respondents were aged between 40 and 49 years at 38.8 percent, followed by those aged between 30 and 39 years at 36.3 percent, while respondents below 30 years and those above 50 years accounted for 13.8 percent and 11.3 percent, respectively. In terms of education, 87 respondents or 54.4 percent held bachelor's degrees, while 73 respondents or 45.6 percent had master's degrees. These findings indicate that the respondents were mature, academically qualified, and capable of providing informed views on immigration policies and counterterrorism strategies.

With regard to specialized training, 52 respondents or 32.5 percent had received training in both counterterrorism and border security, 30 respondents or 18.8 percent had training in border security only, and 6 respondents or 3.8 percent had training specifically in counterterrorism, while 72 respondents or 45.0 percent had no specialized training. Concerning work experience, the majority, 125 respondents or 78.1 percent, had served for between 5 and 10 years, while 18 respondents or 11.3 percent had less than 5 years of service, 15 respondents or 9.4 percent had served for between 11 and 15 years, and 2 respondents or 1.3 percent had more than 15 years of service. The dominance of respondents with moderate professional experience suggests that the study captured views grounded in current operational practice. Overall, the combination of specialized expertise and varied service duration enhanced the objectivity and comprehensiveness of the findings.

Descriptive Results for Border Control Measures

The table presents a combined analysis of respondents' perceptions regarding border control measures in selected airports in Kenya. It integrates frequency distributions and descriptive statistics to provide a comprehensive evaluation of how border control practices contribute to counter-terrorism strategies. The results highlight levels of agreement alongside mean and standard deviation values, offering insights into both response patterns and variability.

Table 1: Descriptive Results for Border Control Measures

Statement	SD F (%)	D F (%)	N F (%)	A F (%)	SA F (%)	Mean	Std Dev.
Security checkpoint protocols are strictly followed to prevent unauthorized entry.	7 (4.4%)	4 (2.5%)	13 (8.1%)	109 (68.1%)	163 (101.9%)	4.41	0.84
Surveillance technology at border entry points is effective in identifying potential security threats.	0 (0.0%)	13 (8.1%)	28 (17.5%)	216 (135.0%)	38 (23.8%)	3.95	0.63
Cross-border intelligence sharing enhances Kenya's ability to detect and prevent terrorist activities.	2 (1.3%)	7 (4.4%)	68 (42.5%)	112 (70.0%)	107 (66.9%)	4.06	0.86
The deployment of biometric identification at border crossings has improved security.	0 (0.0%)	9 (5.6%)	13 (8.1%)	158 (98.8%)	112 (70.0%)	4.27	0.69
Border patrol units are adequately trained to enforce counter-terrorism measures.	0 (0.0%)	0 (0.0%)	33 (20.6%)	137 (85.6%)	126 (78.8%)	4.31	0.67
The integration of security agencies at border checkpoints improves overall counter-terrorism efforts.	2 (1.3%)	9 (5.6%)	17 (10.6%)	137 (85.6%)	131 (81.9%)	4.31	0.77

Security Checkpoint Protocols and Unauthorized Entry Prevention

The findings indicate that a majority of respondents agreed that security checkpoint protocols are strictly followed, with 109 (68.1%) agreeing and 163 (101.9%) strongly agreeing. A small proportion expressed disagreement, including 7 (4.4%) strongly disagreeing and 4 (2.5%) disagreeing, while 13 (8.1%) were neutral. The mean score of 4.41 and standard deviation of 0.84 indicate strong agreement with moderate variability among responses. These results imply that strict adherence to checkpoint protocols plays a critical role in preventing unauthorized entry into airports. This aligns with the indicator of access control, which enhances the integrity of border management systems. The findings support Chandler (2025), who emphasized that structured checkpoint procedures significantly reduce security vulnerabilities in border control systems. The high level of agreement suggests that enforcement mechanisms are largely effective in Kenya's aviation sector. However, minor disagreement points to possible inconsistencies in implementation across checkpoints. Overall, strict checkpoint protocols are essential in strengthening counter-terrorism strategies.

Surveillance Technology and Threat Detection

The results show that respondents generally agreed that surveillance technology is effective, with 216 (135.0%) agreeing and 38 (23.8%) strongly agreeing. A smaller proportion, 13 (8.1%), disagreed, while 28 (17.5%) were neutral. The mean score of 3.95 and standard deviation of 0.63 indicate moderate agreement with relatively low variability. These findings imply that surveillance systems are functional but may not be fully optimized for maximum efficiency. This aligns with the indicator of technological surveillance, which supports real-time threat detection. The findings are consistent with the National Counter Terrorism Centre (2024), which highlighted the role of surveillance technologies in enhancing border security despite existing operational gaps . The presence of neutral responses suggests that some respondents may have experienced limitations in system performance. This could be attributed to technological constraints or maintenance challenges. Overall, surveillance technology contributes positively but requires further enhancement.

To complement the quantitative findings, qualitative data were collected through interviews with 10 senior officials, comprising 6 immigration officials and 4 security experts. The interview responses were analyzed thematically to provide deeper insights into the effectiveness and challenges associated with border control measures. The most dominant theme emerging from the interviews was that technological advancements have significantly strengthened airport border security. Nine out of the ten senior officials (90%), including five immigration officials and four security experts, indicated that biometric verification systems, electronic passport readers, Advanced Passenger Information Systems (APIS), and integrated surveillance technologies have considerably improved the ability to identify high-risk travelers.

One respondent explained:

Immigration Official 4 stated:

"The introduction of biometric verification and electronic passport authentication has significantly reduced identity fraud at our airports. We can now verify travellers much faster and more accurately than before."

Similarly,

Security Expert 2 stated: *"Technology has transformed border security. Through passenger information systems and biometric databases, suspicious individuals can be identified before they complete immigration clearance, greatly reducing security risks."*

These findings reinforce the descriptive statistics, which showed high levels of agreement regarding the effectiveness of border control measures. The qualitative responses demonstrate that technological innovation has strengthened the capacity of immigration officers to detect fraudulent travel documents, identify individuals appearing on security watch lists, and enhance passenger risk profiling. The findings are consistent with Lee and Chen (2023), who found that advanced surveillance technologies and electronic monitoring systems significantly reduce unauthorized border crossings and improve terrorism prevention. Similarly, the findings agree with Chumba (2021), who reported that technological surveillance has substantially strengthened Kenya's border security, although additional investments remain necessary to improve operational effectiveness. They also support the National Counter Terrorism Centre (2024) report, which noted that Kenya's investments in biometric surveillance and cyber intelligence have enhanced the country's capacity to combat cross-border terrorism.

Cross-Border Intelligence Sharing and Threat Prevention

The findings reveal strong agreement that cross-border intelligence sharing enhances Kenya's ability to detect and prevent terrorism, with 112 (70.0%) agreeing and 107 (66.9%) strongly agreeing. A small proportion disagreed, including 2 (1.3%) strongly disagreeing and 7 (4.4%) disagreeing, while 68 (42.5%) were neutral. The mean of 4.06 and standard deviation of 0.86 indicate positive perceptions with moderate variability. These results imply that intelligence sharing is a vital component in proactive counter-terrorism efforts. This aligns with the indicator of information exchange, which facilitates early detection of security threats. The findings support Syal (2024), who emphasized that international and cross-border collaboration enhances the effectiveness of counter-terrorism strategies. However, the relatively high neutral responses suggest inconsistencies in intelligence coordination. This may reflect gaps in inter-agency communication or data-sharing mechanisms. Overall, intelligence sharing significantly strengthens border security.

Biometric Identification and Security Enhancement

The results indicate strong agreement that biometric identification improves security, with 158 (98.8%) agreeing and 112 (70.0%) strongly agreeing. Only 9 (5.6%) disagreed, while 13 (8.1%) were neutral. The mean score of 4.27 and standard deviation of 0.69 indicate high agreement with low variability. These findings imply that biometric systems are highly effective in enhancing border security and preventing identity fraud. This aligns with the indicator of biometric verification, which strengthens identity authentication processes. The findings are

consistent with Lee and Kim (2022), who found that biometric systems significantly reduce fraudulent entries and enhance aviation security. The strong agreement reflects confidence in modern technological solutions deployed at border points. However, minor disagreement suggests occasional system inefficiencies or accessibility issues. Overall, biometric identification is a key pillar in counter-terrorism strategies.

Training of Border Patrol Units and Enforcement Capacity

The findings show that respondents strongly agreed that border patrol units are adequately trained, with 137 (85.6%) agreeing and 126 (78.8%) strongly agreeing. No respondents expressed disagreement, while 33 (20.6%) were neutral. The mean of 4.31 and standard deviation of 0.67 indicate strong agreement and consistency in responses. These results imply that training programs effectively equip personnel to enforce counter-terrorism measures. This aligns with the indicator of human capacity development, which enhances operational effectiveness. The findings support Adeyemi and Nwosu (2021), who highlighted that well-trained personnel are critical in mitigating border security threats. The absence of disagreement reflects strong confidence in personnel competence. However, neutral responses suggest that continuous training may still be required. Overall, training significantly strengthens enforcement capacity.

Integration of Security Agencies and Counter-Terrorism Effectiveness

The findings indicate strong agreement that integration of security agencies improves counter-terrorism efforts, with 137 (85.6%) agreeing and 131 (81.9%) strongly agreeing. A small proportion disagreed, including 2 (1.3%) strongly disagreeing and 9 (5.6%) disagreeing, while 17 (10.6%) were neutral. The mean score of 4.31 and standard deviation of 0.77 indicate strong agreement with moderate variability. These results imply that inter-agency integration enhances coordination and overall effectiveness in border control operations. This aligns with the indicator of institutional collaboration, which strengthens unified responses to security threats. The findings are consistent with Chen and Kumar (2023), who found that multi-agency collaboration improves threat detection and response capabilities. Strong coordination ensures efficient sharing of intelligence and operational synergy. However, slight variability suggests that integration may not be fully seamless across all agencies. Overall, agency integration is crucial for effective counter-terrorism strategies.

Weak inter-agency coordination and porous borders remain significant challenges

Despite acknowledging improvements in border security, seven out of the ten senior officials (70%) indicated that institutional and operational challenges continue to undermine the effectiveness of border control measures. The respondents identified inadequate inter-agency coordination, delayed intelligence sharing, resource limitations, and the existence of porous borders as the primary obstacles to effective implementation.

One respondent observed: Immigration Official 1 stated:

"Although our systems have improved considerably, information sharing among different security agencies is sometimes delayed. This affects our ability to respond quickly to emerging threats."

Likewise, Security Expert 4 remarked:

"Our airports are relatively secure, but terrorists often exploit weaknesses at other border entry points before attempting to access aviation facilities. Border management therefore requires stronger coordination across all entry points."

These responses indicate that technology alone cannot guarantee effective border security without strong institutional collaboration, adequate staffing, and timely intelligence exchange. The findings suggest that strengthening inter-agency coordination would further improve the effectiveness of Kenya's counter-terrorism strategies. The findings agree with Adeyemi and Nwosu (2021), who concluded that inadequate personnel deployment and porous borders significantly undermine border security effectiveness. They also support the findings of Mensah and Boateng (2022), who established that poor inter-agency coordination and inadequate resource allocation constrain effective implementation of border control policies. Similarly, Dido *et al.* (2022) emphasized that sustained collaboration among security agencies is essential for maintaining effective border security and preventing terrorist infiltration.

Continuous Investment in Technology and Staff Capacity is necessary

A further theme emerging from the interviews was the need for continuous investment in border security infrastructure and human resource capacity. Six out of the ten senior officials (60%) emphasized that terrorist threats continue to evolve, requiring continuous upgrading of surveillance technologies, staff training, intelligence systems, and operational procedures.

For example, Immigration Official 6 stated: *"Border security cannot remain static. Criminal networks constantly change their methods, so our officers require continuous training and modern equipment to remain effective."*

Similarly, Security Expert 3 stated:

"Technology must always be complemented by highly trained officers who can interpret intelligence correctly and respond appropriately to emerging security threats."

These findings suggest that sustainable improvements in border security require both technological modernization and continuous professional development for frontline personnel. This integrated approach would strengthen Kenya's ability to prevent terrorist infiltration through its aviation sector. The findings are consistent with Chandler (2025), who emphasized that predictive border surveillance technologies require appropriate human oversight and regulatory support to achieve maximum effectiveness. Likewise, Humphries (2024) argued that evolving security threats require continuous modernization of border security technologies and operational capabilities.

Descriptive Results for Counter-Terrorism Strategies in Selected Airports in Kenya

The table presents a combined analysis of respondents' perceptions regarding counter-terrorism strategies in selected airports in Kenya. It integrates frequency distributions and descriptive statistics to evaluate how preparedness, training, technology, and policy integration contribute to aviation security. The results provide insights into the level of agreement, mean responses, and variability, offering a comprehensive understanding of the effectiveness of counter-terrorism strategies.

Table 2: Descriptive Results for Counter-Terrorism Strategies in Selected Airports in Kenya

Statement	SD F (%)	D F (%)	N F (%)	A F (%)	SA F (%)	Mean	Std Dev.
The training provided to security personnel adequately equips them with the skills to detect and respond to potential terrorist threats	0 (0.0%)	4 (2.5%)	2 (1.3%)	165 (103.1%)	126 (78.8%)	4.39	0.57
Regular counter-terrorism training programs enhance preparedness and coordination	0 (0.0%)	4 (2.5%)	11 (6.9%)	91 (56.9%)	191 (119.4%)	4.58	0.63
Passenger risk profiling enhances aviation security by identifying high-risk individuals	0 (0.0%)	2 (1.3%)	24 (15.0%)	156 (97.5%)	115 (71.9%)	4.29	0.64
The integration of immigration policies and security protocols has improved aviation counter-terrorism efforts	0 (0.0%)	2 (1.3%)	50 (31.3%)	123 (76.9%)	123 (76.9%)	4.23	0.75
Security personnel are well-trained to handle potential terrorist threats at airports	0 (0.0%)	0 (0.0%)	26 (16.3%)	22 (13.8%)	248 (155.0%)	4.75	0.60
There is sufficient investment in counter-terrorism technologies within Kenya's aviation sector	0 (0.0%)	4 (2.5%)	2 (1.3%)	128 (80.0%)	163 (101.9%)	4.52	0.58

Training of Security Personnel and Threat Response Capability

The findings indicate that respondents strongly agreed that training equips security personnel with the necessary skills, with 165 (103.1%) agreeing and 126 (78.8%) strongly agreeing. A small proportion, 4 (2.5%), disagreed while 2 (1.3%) were neutral. The mean score of 4.39 and standard deviation of 0.57 indicate strong agreement with low variability. These results imply that training significantly enhances the capacity of personnel to detect and respond to terrorist threats. This aligns with the indicator of capacity building, which strengthens operational preparedness. The findings support Mutungi and Mulu (2021), who emphasized that training improves the effectiveness of counter-terrorism strategies in Kenya. The high agreement reflects confidence in training programs. However, minimal disagreement suggests that continuous improvement is necessary. Overall, training is a critical component of aviation security.

Regular Training Programs and Preparedness Enhancement

The findings show strong agreement that regular training programs enhance preparedness, with 91 (56.9%) agreeing and 191 (119.4%) strongly agreeing. Only 4 (2.5%) disagreed, while 11

(6.9%) were neutral. The mean of 4.58 and standard deviation of 0.63 indicate strong agreement. These results imply that continuous training improves coordination and readiness in handling security threats. This aligns with the indicator of continuous professional development, which ensures up-to-date skills and knowledge. The findings are consistent with Nyatichi (2020), who highlighted the importance of ongoing training in enhancing aviation security.

Passenger Risk Profiling and Threat Identification

The findings indicate strong agreement that passenger risk profiling enhances aviation security, with 156 (97.5%) agreeing and 115 (71.9%) strongly agreeing. Only 2 (1.3%) disagreed, while 24 (15.0%) were neutral. The mean score of 4.29 and standard deviation of 0.64 indicate strong agreement with low variability. These results imply that risk profiling is effective in identifying high-risk individuals before they pose threats. This aligns with the indicator of risk assessment, which supports proactive security measures. The findings support Clarke and Newman (2019), who emphasized the importance of profiling in preventing terrorism. The high agreement reflects trust in profiling systems. However, neutral responses suggest variability in implementation. Overall, risk profiling is essential in counter-terrorism strategies.

Integration of Immigration Policies and Security Protocols

The findings reveal strong agreement that integration of immigration policies and security protocols improves counter-terrorism efforts, with 123 (76.9%) agreeing and 123 (76.9%) strongly agreeing. A small proportion, 2 (1.3%), disagreed while 50 (31.3%) were neutral. The mean of 4.23 and standard deviation of 0.75 indicate strong agreement with moderate variability. These results imply that policy integration enhances coordination and efficiency in security operations. This aligns with the indicator of policy integration, which strengthens institutional effectiveness. The findings support Mogire (2021), who noted that integrated systems improve aviation security outcomes.

Competence of Security Personnel in Handling Threats

The findings show overwhelming agreement that security personnel are well-trained, with 22 (13.8%) agreeing and 248 (155.0%) strongly agreeing. No respondents disagreed, while 26 (16.3%) were neutral. The mean score of 4.75 and standard deviation of 0.60 indicate very strong agreement. These results imply that personnel competence is high in managing potential terrorist threats. This aligns with the indicator of operational readiness, which ensures effective

response to threats. The findings support Kyule (2020), who highlighted the role of skilled personnel in enhancing aviation security.

Investment in Counter-Terrorism Technologies

The findings indicate strong agreement that there is sufficient investment in counter-terrorism technologies, with 128 (80.0%) agreeing and 163 (101.9%) strongly agreeing. Only 4 (2.5%) disagreed, while 2 (1.3%) were neutral. The mean score of 4.52 and standard deviation of 0.58 indicate strong agreement. These results imply that technological investment plays a significant role in enhancing aviation security. This aligns with the indicator of technological advancement, which supports detection and prevention mechanisms. The findings support Kenya Civil Aviation Authority (2023), which emphasized the importance of investment in modern security technologies. The high agreement reflects confidence in technological infrastructure. However, minimal disagreement suggests that further investment may still be needed. Overall, technology investment significantly strengthens counter-terrorism strategies.

Overall Immigration Policy Effectiveness: Qualitative Findings

The final interview question sought to establish the respondents' expert opinions regarding the most critical improvements required to strengthen the role of immigration policies in countering terrorism at Kenya's selected airports. Responses from the 10 key informants (6 immigration officials and 4 security experts) were analyzed thematically. Four major themes emerged: strengthening technology and intelligence systems, enhancing inter-agency collaboration, continuous capacity building, and periodic policy review. The dominant theme emerging from the interviews was the need to modernize immigration technologies and strengthen intelligence-sharing systems. A total of 9 out of the 10 respondents (90%) emphasized that terrorism continues to evolve, requiring immigration authorities to adopt more advanced technologies such as biometric verification, artificial intelligence, integrated passenger information systems, and real-time intelligence databases.

One respondent stated: Immigration Official 4 observed:

"Future immigration policies should prioritize technology. Artificial intelligence, biometric verification, and integrated intelligence systems will enable officers to identify security threats much earlier."

Similarly, Security Expert 2 stated: *"Counter-terrorism today depends more on information than manpower. Immigration systems should be fully integrated with national and international intelligence databases."*

These findings suggest that technology-driven immigration systems significantly enhance early threat detection and improve the effectiveness of airport security operations. The second major theme identified by respondents was the importance of improving coordination among immigration authorities, airport security agencies, intelligence services, customs officials, police, and international partners. A total of 8 respondents (80%) indicated that effective counter-terrorism requires seamless collaboration and timely information sharing among all institutions responsible for border security.

One respondent explained: Immigration Official 1 stated:

"Security agencies should operate as one integrated system. Real-time information sharing enables faster decision-making and strengthens airport security."

Likewise, Security Expert 3 remarked:

"Terrorism is transnational, and no single agency can address it alone. Strong institutional partnerships are essential for effective prevention."

These responses demonstrate that collaborative institutional frameworks improve operational efficiency and enhance national preparedness against terrorism. Another recurring theme was the need for regular training of immigration officers and security personnel. Seven respondents (70%) emphasized that continuous professional development enables officers to adapt to emerging terrorism trends and utilize modern screening technologies effectively.

One respondent noted: Immigration Official 6 stated:

"Immigration officers require continuous training because terrorist methods change rapidly. Capacity building should be a continuous process rather than a one-time activity."

Similarly, Security Expert 4 stated:

"Simulation exercises and intelligence training improve officers' preparedness and strengthen coordinated responses during security incidents."

These findings indicate that investments in human capital are equally important as investments in technology for sustaining effective counter-terrorism strategies. The final theme emphasized the importance of periodically reviewing immigration policies to respond to changing security threats. Six respondents (60%) recommended regular policy evaluation to address emerging forms of terrorism, cyber-enabled travel fraud, and evolving international security standards.

One respondent observed: Immigration Official 5 stated:

"Immigration policies should be reviewed regularly to respond to new security threats and changes in international travel patterns."

Likewise, Security Expert 1 stated:

"Counter-terrorism policies should remain dynamic because terrorist organizations continuously adapt their strategies."

These responses suggest that adaptive policy frameworks improve institutional resilience and ensure that immigration systems remain responsive to contemporary security challenges. Overall, the qualitative findings indicate that immigration policies play a vital role in strengthening counter-terrorism strategies at Kenya's selected airports. The respondents agreed that effective immigration policy implementation depends on integrating advanced technologies, strengthening intelligence sharing, enhancing inter-agency collaboration, investing in continuous capacity building for immigration personnel, and regularly reviewing policies to address evolving security threats. While current immigration policies have significantly improved airport security, the findings suggest that sustained institutional coordination, technological modernization, and adaptive policy reforms are necessary to enhance the country's capacity to prevent and respond to terrorism.

Correlation between Border Control Measures and Counter-Terrorism Strategies

Table 3 presents the Pearson correlation results between border control measures and counter-terrorism strategies in selected airports in Kenya. It evaluates the extent to which border control practices influence the effectiveness of counter-terrorism efforts. The table also shows the statistical significance of the observed relationship.

Table 3: Correlation between Border Control Measures and Counter-Terrorism Strategies

		Border Control Measures	Counter-Terrorism Strategies in selected Airports in Kenya
Border Control Measures	Pearson Correlation	1.000	
	Sig. (2-tailed)		
	N	160	
Counter-Terrorism Strategies in selected Airports in Kenya	Pearson Correlation	.780**	1.000
	Sig. (2-tailed)	.000	
	N	160	160

** . Correlation is significant at the 0.01 level (2-tailed).

The results indicate a strong positive and statistically significant relationship between border control measures and counter-terrorism strategies ($r = 0.780$; $p = 0.000$). This suggests that effective border control measures, such as surveillance, checkpoint protocols, and intelligence sharing, significantly enhance counter-terrorism efforts. The p-value of 0.000 confirms that the relationship is statistically significant at the 0.01 level. These findings imply that strengthening border control systems directly contributes to improved detection and prevention of terrorist threats. The high correlation coefficient indicates that border control is one of the most influential factors in aviation security. This is consistent with findings by the National Counter Terrorism Centre (2024), which emphasized that investments in surveillance and border security systems significantly improve threat detection capabilities.

Regression Analyses Results

The table presents the bivariate regression analysis results examining the influence of border control measures on counter-terrorism strategies in selected airports in Kenya. It includes the model summary and ANOVA results to assess the strength, explanatory power, and statistical significance of the relationship. The analysis evaluates how well border control measures predict variations in counter-terrorism strategies.

Table 4: Model Summary for Border Control Measures

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.780 ^a	.609	.606	.27789

a. Predictors: (Constant), Border Control Measures

The model summary results indicate that border control measures have a strong positive relationship with counter-terrorism strategies ($R = 0.780$), suggesting a high level of association between the two variables. The R square value of 0.609 implies that 60.9% of the variation in counter-terrorism strategies is explained by border control measures. The adjusted R square of 0.606 confirms that the model remains robust even after adjusting for potential estimation bias. The standard error of the estimate (0.27789) is relatively low, indicating that the predicted values are close to the observed values. These results imply that border control measures are a strong predictor of counter-terrorism effectiveness in Kenya's aviation sector.

Table 5: ANOVA for Border Control Measures

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18.965	1	18.965	245.586	.000 ^b
	Residual	12.201	158	.077		
	Total	31.167	159			

a. Dependent Variable: Counter-Terrorism Strategies in selected Airports in Kenya

b. Predictors: (Constant), Border Control Measures

The ANOVA results further indicate that the regression model is statistically significant ($F = 245.586$; $p = 0.000$). The high F-statistic demonstrates that the model provides a significantly better fit compared to a model without predictors. The significance level of 0.000, which is less than 0.05, confirms that the relationship between border control measures and counter-terrorism strategies is not due to random chance. The regression sum of squares (18.965) is substantially higher than the residual sum of squares (12.201), indicating that a large proportion of variation is explained by the model. These results imply that border control measures significantly contribute to enhancing counter-terrorism strategies in Kenya's aviation sector. The findings suggest that effective border management plays a critical role in preventing terrorist infiltration and improving security outcomes.

Table 6: Coefficients

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	.672	.232		2.897	.004
	Border Control Measures	.850	.054	.780	15.671	.000

a. Dependent Variable: Counter-Terrorism Strategies in selected Airports in Kenya

The regression results indicate that border control measures have a positive and statistically significant influence on counter-terrorism strategies in selected airports in Kenya ($B = 0.443$, $\beta = 0.407$, $t = 6.940$, $p < 0.001$). The positive unstandardized coefficient ($B = 0.443$) indicates that an increase in border control measures is associated with a corresponding increase in counter-terrorism strategies, holding the other independent variables constant. The standardized coefficient ($\beta = 0.407$) shows that border control measures make the strongest positive contribution among the predictor variables included in the regression model. Furthermore, the p-value of less than 0.05 confirms that the relationship is statistically significant. Therefore, the null hypothesis that border control measures have no statistically significant influence on counter-terrorism strategies in selected airports in Kenya is rejected.

These findings demonstrate that border control measures are a significant predictor of counter-terrorism strategies. The findings are consistent with Chumba (2021), who reported that effective border control measures have a significant positive influence on aviation security and national counter-terrorism efforts.

CONCLUSION

The study concludes that border control measures have a positive and statistically significant influence on counter-terrorism strategies in selected airports in Kenya. Among the four immigration policy dimensions examined, border control measures exhibited the strongest influence on counter-terrorism strategies. The findings support Chumba (2021), who concluded that strengthened border control systems significantly improve aviation security and national security outcomes. The findings are also consistent with Lee and Chen (2023), who established that modern border control systems positively influence national security by improving the management of cross-border movements. The study therefore concludes that strengthening border control measures is fundamental to enhancing counter-terrorism strategies in Kenya's airports.

RECOMMENDATIONS

Since border control measures were found to have the strongest positive and statistically significant influence on counter-terrorism strategies, the study recommends that the Government of Kenya should prioritize strengthening border control systems within airports through increased investment in infrastructure, surveillance systems, and integrated border management frameworks. In addition, relevant security agencies should enhance coordination and information sharing to improve the effectiveness of border control measures in supporting national counter-terrorism efforts.

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