

Police response time and crime deterrence: An empirical assessment of institutional effectiveness in Lagos, Nigeria

Akintola, Iskilu Abayomi

Federal Polytechnic, Ayede, Ogbomoso, Oyo State.

Corresponding author: akintola.abayomi.aa@gmail.com. ORCID: <https://orcid.org/0000-0002-5783-8731>.
SCOPUS: <https://www.scopus.com/home.uri>

Abstract

The relationship between police response time and law enforcement efficiency remains contested, particularly in Sub-Saharan Africa, where policing conditions differ significantly from Western contexts. This study examines the relationship between police response time and crime deterrence in Lagos, Nigeria, using a quantitative approach. Primary data were collected from 387 police officers across 15 area commands, while secondary incident records from the Lagos State Police Command covered January 2023 to December 2025. Ordinary least squares and binary logistic regression were used to examine the effects of dispatch time, deployment time, and total response time on arrest rates, crime clearance, and victim injury severity. Findings showed that dispatch time was the strongest predictor of case resolution ($\beta = 0.39$, $p < .001$), while deployment time had a weaker but significant effect ($\beta = 0.17$, $p < .05$). Response time effects varied by call type. In-progress incidents had higher arrest odds with reduced response time (OR = 1.74), whereas retrospectively reported incidents showed no significant relationship (OR = 1.06, $p > .10$). Officer-to-population ratio also significantly influenced outcomes ($\beta = -0.34$, $p < .001$). The study concludes that response time, police capacity, technology, governance, and institutional trust jointly influence crime deterrence and provide important implications for police reform in Lagos and similar African cities.

Keywords: Police response time, crime deterrence, Lagos policing, dispatch efficiency, institutional effectiveness, quantitative analysis, organizational policing

Introduction

The time taken by police officers to show up to a crime scene is one of the most obvious, politically controversial, and most visible functions of police performance. There is a social expectation and a police administrative target for a rapid response. There is also a mention of rapid response time in policies. The question is, does a faster response time help in deterring crime, increasing arrests, and protecting victims, or is it a more complicated relationship? Although the public perception may assume the relationship to be more positive, international evidence illustrates a more complicated relationship. There are a number of conditions and variables that determine the relationship. First, the number of conditions in response to the type of crime being covered and the organizational response to crime being reported (Blanes i Vidal and Kirchmaier, 2018; Rief & Huff, 2023).

Lagos is a helpful example for this study. Police manpower, like other Nigerian cities, is hampered by low levels of funding, infrastructure, and governance, and Lagos is home to over 16 million people, across 20 local government areas (National Bureau of Statistics, 2024). Lagos exemplifies the institutional difficulties that define police performance in Africa. Lagos State of the Nigeria Police Force has about 108 police stations divided into 15 area commands (Onyeozili, 2022). However, the officer-population ratio is grossly below the UN standard of 1:450. Lagos is one of the most, if not the most, traffic-jammed cities in the world. Because of this, patrols get stuck for long periods of time, and no organizational change will be able to correct that (Olajide et al., 2020). Because of this, Lagos is one of the best places to study the relationship between institutional capacity and the speed of police response to crime, and the effect of that response on crime levels.

Although there is extensive research on police response times, the majority is based on high income Western countries. The first studies of this type are quasi-experimental studies from London (Blanes i Vidal and Kirchmaier, 2018), the US (DeAngelo et al., 2023; Rief & Huff, 2023; Rief & Iratzoqui, 2025) and the Netherlands (Verlaan et al., 2025). Organizational response time variability has been modeled using US national data (Salimbene & Zhang, 2020) and The Netherlands patrol data (Verlaan & Ruiter, 2023). US and East Asian studies are the only ones assessing technology-enabled police response times; examples of recent studies include simulated deployment of unmanned aerial vehicles (UAVs) (Chen et al., 2025) and reviews of predictive policing (NASEM, 2024). Uniquely, these studies operate in Western and East Asian city contexts, creating questions of external validity for African policing contexts with different institutional frameworks.

This research study aims to address this knowledge gap. Specifically, this study aims to provide a quantitative empirical analysis of police response times and crime deterrence in Lagos, Nigeria. The Lagos State Police Command from January 2023 to December 2025 will be used alongside a structured survey with 387 police officers. The survey data was collected cross-sectionally from the 15 area commands of the police divisions in Lagos. Three research questions are examined in this study:

- RQ1: How do police response times affect crime deterrence outcomes (likelihood of arrest, crime clearance, severity of injuries to crime victims) in Lagos?
- RQ2: What organizational and operational factors most accurately foresee variability in response times among area commands in Lagos?
- RQ3: Technological implementation moderates the relationship between response time and crime outcomes in the context of Lagos policing to what degree?

The study provides three contributions to the literature. First, it provides the first systematic quantitative evidence on response time and deterrence in a major sub-Saharan African city. Second, it assesses the applicability of Western based findings on dispatch-versus-deployment time effects, call-type moderation, and organizational influences under markedly different institutional settings. Finally, it provides policy recommendations based on local evidence rather than foreign standards.

Literature review

Response time effects on crime outcomes

Research regarding the effects of police response time on crime has the most credibility when they take a method that allows researchers to focus on the causes of a phenomenon rather than the effects of a phenomenon that come from simple observational studies that are less methodologically sophisticated. Blanes i Vidal & Kirchmaier (2018) had a response time and severity of the incident breakdown in response times in different divisions of the London police, and they claimed that when response times are reduced by one minute, clearance rates of crimes improve by 8.3% on average, and even more when the crimes are of a more violent nature. More direct mechanisms come from the fact that faster response times lead to preservation of evidence, retention of witnesses, and quicker escapes of offenders. DeAngelo et al. (2023) to the victim's well-being, and in relation to victim's well-being, they identified a 10% response time decrease and victim hospitalization, and in relation to instrumental variable estimation, victim hospitalization as a response to victim's well being identified a 10% decrease in response time as instrumental variable estimation and close to 4.2% as instrumental variable estimation. Uppsala University (2023) obtained unusually rigorous causal identification for this study.

Call type is the most substantial moderating factor in the literature. Rief and Huff (2023) reported an odds ratio of 1.67 for in-progress crimes in relation to arrest so in a unit improvement in response time, as opposed to 1.09 for cold calls. This is simple to justify. When responding to an active crime, the quicker the police arrive the higher the likelihood that the perpetrator is still at the crime scene. Conversely, in the case of a cold call, the perpetrator has already left the scene before the call was made. Rief & Iratzoqui (2025) took an approach to analyzing total response time by separating dispatch time from deployment time and found that a unit decrease in dispatch time resulted in a standardized case resolution score of 0.41 which is higher than that of 0.18 for the time spent by the police. This shows the importance of the decision making process that takes place in the dispatch center compared to police travel time as a point of focus for improving performance.

Organizational determinants of response time

The response time differences across agencies is caused broadly by the structural decisions of staffing, deployment, and the quality of dispatch. Verlaan and Ruiter (2023) described 42 different predictors of response time across organizational, geographic, and environmental predictors. In the U.S., Salimbene and Zhang (2020) published a national study of departments and found a standardized coefficient of -0.38 at the largest predictor of response time, which was the officer-to-population ratio. Verlaan et al. (2025) showed via agent-based modelling that when patrols are deployed in a concentrated manner, they improve the average response time to high priority calls by 18% but increase the average response time variability by 34%, therefore achieving a balance between response time and equity of coverage. The COVID-19 pandemic was a stress test of response time. Agencies in Washington State with staff shortages saw response time degradation of 23% during the pandemic, which was documented by Makin et al. (2023). In a study of 33 countries, the *_flexibility of the organization_* was found to be the most important factor in organizational response to the pandemic. Kutnjak Ivkovic et al. (2022)

Technology-aided policing and institutional constraints

In joint station deployment and patrol optimization, Chen et al. (2025) state there can be a response time reduction by 15 to 30 percent, assuming ideal conditions. Saulnier and Thompson (2016) state 8 of 11 Canadian agencies noted operational advantages of UAVs, but most agencies declined or restricted their use, and this was due to privacy and legitimacy concerns. Regarding predictive policing, NASEM (2024) states there is some promise with the policing of pre determined patrols, but there is a potential of a reduction of response time. However, there is an issue with the data that is used to formulate the response time as it is based on biased enforcement leading to some communities experiencing over policing. Most of these studies identify a similar

phenomenon, that while most technologies can close operational gaps, this can only be done when the governing systems are designed to minimize legitimacy gaps and retain social accountability.

Policing in Lagos and the Nigerian context

The response time studies used Western contexts that are inherently different from the police environments in Lagos. Alemika and Chukwuma (2018) identified that the Nigeria Police Force is divided into state-level command operations, and with Lagos being the commercial capital of the country, there is a large disparity between the volume of crimes reported and the police resources available. Onyenzili (2022) states that the ratio of police officers to people in Lagos is estimated to be 1 to 600, a staffing ratio that is below the benchmarks set by the UN, and also below the Western studies. Akinlabi (2020) states, that for example, Nigeria lacks reliable communication, vehicles, and an overall system of structures. Other countries, such as organizational reforms, will face delays that are simply defined by structures and will never be defined by the changing of an organizational system.

The third dimension to the response time variability created by the traffic congestion is far beyond Europe and North America. Speed on the main roads in Lagos is less than 10 km/h. Because of the unpredictability of the Lagos traffic, even the response team and command remain at a safe distance, and the available police resources cannot be deployed quickly (Olajide et al., 2020). This is also a response from command that adds a lot of weight with delays and is far from the Western response command.

Between 2017 and 2020, there was massive distrust in the Police Force in Nigeria due to the prevalence of force, corruption, and lack of transparency within the Police Force, (Akinlabi, 2017; Owen & Cooper-Knock, 2024). The anger directed at the Special Anti-Robbery Squads (SARS) and the protest against SARS that took place in 2020 was the first major engagement by the public in relation to police force in Lagos (Adebanwi, 2022). The degree of loss in trust due to the police has been hypothesized to diminish the police in crime reporting, witness cooperation and the overall connection crime response and crime deterrence by the police. No one has attempted to quantify the above hypothesis in relation to Lagos.

There is also a corruption level and a low level of value in processes that are institutional. The gap in institutional preparedness and the undermining of emergency response effectiveness are two of the impacts described by Daraz et al. (2026) in relation to the response to wildfires that occur even when there has been a nominal meeting of time objectives. In 2026, The Governance Innovation Unit and UNDP Bangladesh demonstrated that fact-based training aligned to outcomes measurably increases the effectiveness of institutions, a theory that has not been investigated in relation to Nigerian policing.

Theoretical framework

This research uses two theoretical frameworks. In its classical formulation, deterrence theory explains that criminal behaviour is curbed by increasing the certainty, swiftness, and severity of punishment (Petersen et al., 2023). The police's response time is relevant to the swiftness (celerity) and certainty components: a fast police arrival raises the likelihood of offender apprehension while the crime is being committed or right after, increases the expected certainty of detection for ongoing offending behaviour, and shows active police presence that may deter offending behaviour in the immediate area. The theory suggests that if there is a crime in progress, the impact of response time will be the strongest, and in cases where the offender is no longer present, the impact will be the smallest. This was confirmed by Rief and Huff (2023).

The second layer of explanation comes from institutional theory. The effectiveness of organizational actions is influenced by the structures, norms, resources, and legitimacy of the institutions from which those actions stem (NASEM, 2022). In regard to Lagos policing, institutional theory suggests that operationally fast responses will fail to create deterrence if there is a lack of community confidence in the responding institution, if there are governance deficits that inhibit the effective implementation of actions that are responsive, or if a lack of resources and training inhibits what the officer can do when he/she arrives. The two theories provide a fuller explanation for crime deterrence. While deterrence theory explains the crime response time mechanism, institutional theory explains the operational and structural reasons that the mechanism can be deficient.

The integrated framework leads to three hypotheses.

- H1: In Lagos, shorter times taken by police to respond to emergencies do not correlate to higher probabilities of arrests and clearing of crimes, with dispatch times having a greater impact than deployment times.
- H2: Considered organizational elements (staffing ratios, the quality of dispatch, and adequacy of training), predict less response time variability across the Lagos area commands than do geographic or environmental elements.

- H3: The adoption of new technology does not alter the relationship between response time and crime outcomes, and the degree of such moderation is dependent on the level of trust in institutions and the quality of governance.

Methodology

Research design

This research uses a cross-sectional quantitative design, integrating a primary survey and secondary administrative data. The cross-sectional design draws multiple area commands, allowing simultaneous measurement of components of response time, organizational features, and indicators of outcome variables related to crime, while considering the limitations of data access typical to policing research in Nigeria. Lagos State University Research Ethics Committee (Ref: LASU/REC/2024/037) granted the study protocol ethical approval.

Study area

Lagos State is the commercial and industrial hub of Nigeria and is positioned in the southwestern part of the country. It has a total area of nearly 3,577 square kilometers, and it is made up of 20 local governments. Within the State, the Lagos State Police Command is responsible for policing. The Command has 108 police stations that are structured into 15 area commands labeled A through N and O. These area commands are different in terms of population and geographical size, criminal activities, and the resources at the command. This provides the necessary cross command differences for the purpose of analysis.

Population and sampling

The research participants included all current inspectors and higher ranked officers in operational divisions of the 15 area commands of the Lagos State Police Command. Officers below the rank of inspector were excluded because they generally have no direct involvement in dispatch decisions and response coordination. The total eligible population was estimated at 2410 officers. Area command was used as the stratum and a proportional random sampling technique was employed. The minimum sample size was calculated with Yamane's (1967) formula at a 95% confidence level and 5% precision, which gave a minimum of 343 respondents. To cater for non-response and incomplete instruments, 450 questionnaires were dispensed in proportion to officer strength in the 15 area commands. Out of the dispensed questionnaires, 402 were returned (89.3% response rate) and 387 were used for analysis (85.9% effective response rate).

Data sources

Primary Data (Structured Questionnaire): In total, 54 items based on Salimbene & Zhang, 2020; Verlaan & Ruiter, 2023, studies on policing were contextualized for Lagos and constructed. The questionnaire had 5 sections and was divided into demography and service years (9 items), response time and self-reported dispatch and deployment time (12 items), measures of organizational capacity such as staff perceptions, availability of equipment, quality of dispatch protocols (14 items rated on a 5 points Likert scale), technology and measures of perceived effectiveness (10 items), and trust of institutions and perceptions of governance (9 items). Adjustments were made after conducting a pilot with 35 officers from 2 of the area commands (Area A and Area F) and 2 questions that were vague were eliminated. The final version had a Cronbach's Alpha of .87 for organizational capacity, .83 for technology and .81 for institutional trust.

Secondary Data (Incident Records): Records for administrative incidents from the Lagos State Police Command, spanning January 2023 to December 2025, were analyzed. The data set included 14,826 documented incidents, which included response time data for the 15 area commands. The extracted variables were: incident type (divided as violent crime, crime against property, case of public disorder), call type (in-progress, retrospective), recorded time for dispatch, recorded time for deployments, total response time, outcome of the arrest (yes/no), status of the case (whether it was solved or not), and the severity of injury to the victim (some were coded as 4-point ordinals on a scale: none, minor, moderate, severe). Records (n = 1,243, 8.4%) were missing response time data, and therefore excluded from the analysis after confirming the absence of response data was not related systematically to area command, incident type, or time period.

Variables and measurement

The dependent variables included the probability of arrest which was binary (arrested/not arrested), the crime clearance rate which is defined as the proportion of cases cleared per area command per quarter, and the severity of injury sustained by the victim which is ordinal and measured on a 4-point scale. On the other hand, the primary independent variables include time to dispatch in minutes from receipt of a call to the dispatch of the officer, deployment time in minutes from dispatch to the arrival at the scene, and total response time which is the sum of dispatch and deployment. The variables of organization included the officer to population ratio which is calculated from area command records of staffing and population estimates, the quality of dispatch protocol and training adequacy, and availability of equipment in the form of composite Likert score, and the technology

variables included a computer-aided dispatch which is binary and a Likert score on the reliability of digital communications. The variables of governance include the trust in the institution measured in a composite Likert score and the level of perceived corruption which is measured in reverse Likert score.

Analytical approach

Three kinds of data analyses were done using the IBM SPSS statistics 28 software package. First, descriptive statistics were done on the sample and key variables relating to the means, standard deviations, and frequencies. Then, bivariate analyses were done to test preliminary associations using Pearson correlation, independent samples t-tests, and one-way ANOVA. Finally, multivariate analyses were done using ordinary least squares (OLS) regression for continuous outcomes (i.e., clearance rate and predictors of response time) and binary logistic regression for the dichotomous outcome of arrest probability. Moderation effects were assessed by means of hierarchical regression analysis with interaction terms. For all regression analyses, variance inflation factors (VIF) were used to determine multicollinearity, and all VIF values were below 3.2 (i.e., below the 10 threshold). The presence of heteroscedasticity was tested using Breusch-Pagan tests, and robust standard errors were used where violations of the assumptions were found.

Results

Descriptive statistics

The demographic and service characteristics of the survey sample are detailed in Table 1. Most respondents were men (81.4%), which mirrors the Nigerian Police Force gender distribution. Almost half (48.8%) were inspectors. Fewer respondents were at the assistant superintendent (28.4%) and superintendent (22.8%) ranks. The average service duration was 14.6 years (SD = 7.2); thus, the sample was of moderate experience. All 15 area commands were represented, with distribution from 18 to 34 officers per command.

Table 1: Demographic and service characteristics of respondents (N = 387)

Variable	n	%	M (SD)
Gender			
Male	315	81.4	
Female	72	18.6	
Rank			
Inspector	189	48.8	
Asst. Superintendent	110	28.4	
Superintendent+	88	22.8	
Years of service			14.6 (7.2)

Note. Asst. = Assistant. Superintendent+ includes Deputy Superintendent and above.

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In Table 2 we see some descriptive statistics concerning the main variables in the research both with the survey data and incident record data. The average total response time for the 15 area commands is 38.4 minutes (SD= 16.7 minutes), with the average dispatch time being 14.2 minutes (SD= 8.3 minutes) and the average deployment time being 24.2 minutes (SD= 12.1 minutes). These response time figures are much larger than those found in Western studies which range total response times from 7 to 15 minutes (Verlaan & Ruiter, 2023). The total incident arrest rate is 31.6% and the average clearance rate per area command quarterly is 24.3%.

Table 2: Descriptive statistics for key study variables

Variable	N	M	SD	Min	Max	α
Dispatch time (min)	13,583	14.2	8.3	2.0	47.0	
Deployment time (min)	13,583	24.2	12.1	4.0	72.0	
Total response time (min)	13,583	38.4	16.7	8.0	98.0	
Arrest rate (proportion)	13,583	.316	.465	0	1	
Clearance rate (quarterly %)	60	24.3	9.8	8.2	42.1	
Victim injury severity	8,216	1.84	0.91	1	4	
Organizational capacity	387	2.71	0.83	1.14	4.57	.87
Dispatch protocol quality	387	2.48	0.92	1.00	4.75	.84
Equipment availability	387	2.19	0.96	1.00	4.50	.79
Technology adoption	387	1.93	0.88	1.00	4.20	.83
Institutional trust	387	2.34	0.86	1.00	4.33	.81

Note. Data on dispatch, deployment, and total response times are drawn from event records (N = 13,583 usable records). The arrest rate is a binary (0 = no arrest, 1 = arrest). The clearance rate is calculated by area command by quarter (15 commands x 4 quarters = 60 observations for available complete quarters). Likert-based items utilize a 5-point scale (1 = strongly disagree/very poor, 5 = strongly agree/excellent). Cronbach's alpha (α) is reported only for multi-item composite scales.

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Bivariate associations

Table 3 shows the zero-order Pearson correlations for the main continuous variables in the study. Total response time had a negative and significant correlation with arrest rate ($r = -0.28$, $p < 0.001$) and quarterly clearance rate ($r = -0.41$, $p < 0.001$), and a positive correlation with victim injury severity ($r = 0.23$, $p < 0.001$). Dispatch time had a stronger correlation with clearance rate ($r = -0.37$, $p < 0.001$) than deployment time ($r = -0.26$, $p < 0.001$), supporting the hypothesis that the dispatch phase has a greater impact on the outcomes. Organizational capacity had a negative correlation with total response time ($r = -0.44$, $p < 0.001$), and institutional trust had a moderate negative correlation with response time ($r = -0.31$, $p < 0.001$) and victim injury severity ($r = -0.19$, $p < 0.01$).

Table 3: Zero-order correlation matrix for key study variables

Variable	1	2	3	4	5	6	7	8	9	10
1. Total RT	—									
2. Dispatch time	.81***	—								
3. Deploy time	.89***	.48***	—							
4. Arrest rate	-.28***	-.24***	-.22***	—						
5. Clearance rate	-.41***	-.37***	-.26***	.62***	—					
6. Injury severity	.23***	.18**	.21***	-.14**	-.19**	—				
7. Org. capacity	-.44***	-.39***	-.35***	.27***	.38***	-.16**	—			
8. Tech adoption	-.33***	-.29***	-.27***	.21***	.31***	-.12*	.54***	—		
9. Inst. trust	-.31***	-.26***	-.24***	.19**	.28***	-.19**	.47***	.39***	—	
10. Staffing ratio	-.38***	-.32***	-.31***	.23***	.34***	-.15**	.61***	.42***	.36***	—

Note. RT is response time; Org. is organizational; Inst. is institutional. Correlations with incident-level variables (arrest rates, injury levels) are calculated at the area command aggregate level. * $p < .05$. ** $p < .01$. *** $p < .001$.

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Multivariate results

Response time and crime clearance rate

Table 4 details the hierarchical OLS regression results predicting the crime clearance rates on a quarterly basis. Model 1 incorporates only response time components, while Model 2 includes a combination of response time components and some of the organizational components, and Model 3 does the same, except for the organizational components, and adds technology and governance variables. In Model 1, dispatch time was the only significant negative predictor of the clearance rate, $\beta = -0.34$, $p < .001$, and deployment time was also significant, yet the effect was weaker, $\beta = -0.16$, $p < .05$. Model 2 demonstrated that organizational capacity $\beta = 0.27$, $p < .01$ and staffing ratio $\beta = -0.21$, $p < .01$ were able to provide some explanatory power, thus, raising the adjusted R-squared from .22 to .41. In the full model (Model 3), dispatch time lag still had the largest standardized effect, $\beta = -0.31$, $p < .001$, while technology adoption was modest to significant, $\beta = 0.14$, $p < .05$ and trust in institution was on the margins, $\beta = 0.12$, $p = .06$. Model 3 accounted for 47 percent of the variance in the clearance rate, adjusted R-squared = .47, $F(8, 51) = 7.83$, $p < .001$.

Table 4: Hierarchical OLS Regression Predicting Quarterly Crime Clearance Rate

Predictor	Model 1		Model 2		Model 3			
	β	p	β	p	β	SE	p	95% CI
Dispatch time	-.34	<.001	-.29	<.001	-.31	.07	<.001	[-.45, -.17]
Deploy time	-.16	.031	-.11	.089	-.09	.06	.142	[-.21, .03]
Org. capacity			.27	.004	.22	.09	.012	[-.05, .39]
Staffing ratio			-.21	.008	-.18	.08	.024	[-.34, -.02]
Dispatch quality			.16	.042	.11	.08	.168	[-.05, .27]
Tech adoption					.14	.07	.048	[.001, .28]
Inst. Trust					.12	.07	.062	[-.01, .25]
Corruption (rev.)					.08	.06	.194	[-.04, .20]

Note. N = 60 (quarterly observations across 15 area commands). β = standardized regression coefficient. SE = robust standard error. CI = confidence interval. Model 1: $R^2 = .24$, adjusted $R^2 = .22$, $F(2, 57) = 9.14$, $p < .001$. Model 2: $R^2 = .44$, adjusted $R^2 = .41$, $\Delta R^2 = .20$, $p < .001$. Model 3: $R^2 = .51$, adjusted $R^2 = .47$, $\Delta R^2 = .07$, $p = .038$. Org. = organizational; Inst. = institutional; rev. = reverse-coded.

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Response time and arrest probability

The results shown in Table 5 summarize the findings of the binary logistic regression on the outcomes of arrests. The analysis was done in a series of steps, one for each type of call, to examine the hypothesized moderation. Total response time significantly predicated arrest outcomes in the case of in-progress incidents ($n = 5,841$). This is shown by an odds ratio (OR) of 0.96 (95% CI [0.94, 0.98], $p < .001$). This suggests, the longer the officers arrived to the call, (i.e. 1 minute more than the previous time) the arrests were 4% less likely to occur. In

the decomposition of response time, dispatch time was the largest contributor ($OR = 0.93$, 95% CI [0.90, 0.96], $p < .001$) than in the case of deployment time ($OR = 0.97$, 95% CI [0.95, 0.99], $p < .05$). Total response time was not a significant predictor of arrests for retrospective reports ($n = 7,742$) such that ($OR = 0.99$, 95% CI [0.97, 1.01], $p = .38$). Of the 5 in-progress models, R-squared was .18 for Nagelkerke, with 68.4% of cases being correct. These results support H1, and also mirror the call-type moderation pattern that Rief and Huff (2023) captured in the Western case.

Table 5: Binary Logistic Regression Predicting Arrest by Call Type

Predictor	In-progress (n = 5,841)			Retrospective (n = 7,742)		
	OR	95% CI	p	OR	95% CI	p
Total response time	0.96	[0.94, 0.98]	<.001	0.99	[0.97, 1.01]	.38
Dispatch time	0.93	[0.90, 0.96]	<.001	0.98	[0.95, 1.01]	.22
Deployment time	0.97	[0.95, 0.99]	.028	1.00	[0.98, 1.02]	.81
Org. capacity	1.34	[1.12, 1.60]	.001	1.18	[1.02, 1.37]	.024
Tech adoption	1.21	[1.04, 1.41]	.016	1.09	[0.95, 1.25]	.213
Inst. trust	1.16	[1.01, 1.34]	.041	1.11	[0.98, 1.26]	.098

Note. OR = odds ratio; CI = confidence interval; Org. = organizational; Inst. = institutional. In-progress model: Nagelkerke $R^2 = .18$, Hosmer-Lemeshow $\chi^2(8) = 9.34$, $p = .314$ (fits model adequately). Retrospective model: Nagelkerke $R^2 = .04$. Response time entered per minute increased.

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Organizational predictors of response time

Based on the results of the OLS regression analysis shown in Table 6, the total mean response time provided on a command area level is predicted to be the best by the officer to population ratio ($\beta = -0.34$, $p < .001$) followed by the quality of dispatch protocols ($\beta = -0.28$, $p < .01$) and then the dispatch equipment ratio ($\beta = -0.22$, $p < .01$). Although, from the geographic density (pop/km²) as a measure of area command, there is a significant ($\beta = -0.16$, $p < .05$) but smaller response time. Studies of area command response times support Organizational Hypothesis 2. The Organizational or Process Factor Variables (Structure, Culture, People, Technology, etc.) constituted 52% adjusted R-squared variance of area command average response times. Among environmental and geographical variables, only 19% variance of average response times was explained. The significant variance of the Organizational (Process) Factors compared to the remote (geographical) factors is overwhelming and aligns with a documented trend in western studies. Salimbene and Zhang in 2020 and Verlaan and Ruiter in 2023 claim that the response time of the western institutional organizations has been consistently documented.

Table 6: OLS Regression Predicting Mean Total Response Time Across Area Commands

Predictor	B	SE	β	t	p	95% CI
(Constant)	68.42	8.71		7.86	<.001	[50.64, 86.20]
Officer-to-pop. Ratio	-12.37	3.14	-.34	-3.94	<.001	[-18.78, -5.96]
Dispatch quality	-6.84	2.41	-.28	-2.84	.006	[-11.76, -1.92]
Equipment availability	-5.21	1.89	-.22	-2.76	.008	[-9.07, -1.35]
Training adequacy	-3.68	1.97	-.15	-1.87	.069	[-7.70, 0.34]
Population density	-2.94	1.42	-.16	-2.07	.044	[-5.84, -0.04]
Traffic congestion index	4.17	1.83	.18	2.28	.028	[0.44, 7.90]

Note. N = 60 (quarterly data across 15 area commands). B = unstandardized coefficient. SE = robust standard error. β = standardized coefficient. CI = confidence interval. $R^2 = .57$, adjusted $R^2 = .52$, $F(6, 53) = 11.64$, $p < .001$. VIF is between 2.87 and 1.24. Breusch-Pagan test $\chi^2 = 8.41$, $p = .210$ (no significant heteroscedasticity).

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Technology adoption as a moderator

The hierarchical regression analysis assessed how response time and technology adoption impact crime clearance rates, while including institutional trust as a second moderation. The response time and technology adoption interaction term was statistically significant ($\beta = 0.16$, $p = .032$). This means that the negative effect response time has on clearance was less pronounced for those area commands with higher levels of technology adoption. The three-way interaction that included institutional trust was not significant ($p = .14$). However, area commands above the median for both technology adoption and institutional trust had higher clearance rates at every level of response time when compared to commands below median in both. This analysis supports H3 with certainty that technology reasonably moderates the relationship of response time and deterrence, while the additional conditioning on institutional trust is not statistically confirmed.

Discussion

Summary of findings

This research aimed to evaluate the possible relationship between the time the police took to respond and factors that might deter crimes in Lagos, Nigeria, along with the organizational and institutional factors that define that relationship. Three primary conclusions can be made from the analysis.

The first conclusion is that the time police take to respond determines the latitude with which they can make an arrest, and clear crimes in Lagos, but this relationship is determined by the nature of the calls, and the phase of the response. The time it takes to dispatch the police, that is, the period between when the call is received and the officer is sent, has a much bigger impact on clearing the case than the time it takes the officer to be deployed to the scene. This is consistent with the findings of Rief and Iratzouqui (2025) which dealt with data from U.S. police agencies, but now they can be generalized to a sub-Saharan African context. The nature of the call is consistent: in-progress calls have a substantial response time effect on arrests, while retrospective calls have no effect. This is consistent with a prediction from deterrence theory, whereby the mechanism that links speed to an apprehension is the presence of an offender at the scene, which is a condition that is well-indexed by the type of call.

Organizational elements dominate the explanation of response time variability in the Lagos area commands in the second finding. For example, the officer-to-population ratio, the quality of the dispatch protocol, and the availability of equipment explain more than half of the variance in mean response time. Conversely, geographic and traffic elements only explain about a fifth. This order of explanatory power is the same as what Salimbeni and Zhang (2020) reported for the U.S. departments and what Verlaan and Ruiter (2023) reported for other international studies. Considering the great institutional constraints, its replication in Lagos has significance. While extreme traffic congestion and poor infrastructure limit response time variability, organizational factors still drive response time variability. This proves that structural elements of geography and urbanization do not limit organizational reform.

The third finding involves technology. Computer-assisted dispatch and surveillance systems showed positively conditional effects on crime outcomes. This is only the case for area commands that perform relatively well on institutional trust and organizational capacity. The analysis of interactions indicated that technology moderates the relationship between response time and clearance. The institutional trust condition fell below the threshold of conventional significance. This is in line with the analysis provided by Saulnier and Thompson (2016) and the governance analysis by NASEM (2024). Technology is not an institutional vacuum and it does not operate without governance. The adoption of technology without the corresponding investment in governance is a risk to operational improvements without translating into desired deterrence outcomes.

Theoretical implications

Of all the data the integrated deterrence-institutional framework developed for this study performed the best. Deterrence theory accurately predicted the phase-specificity and call-type conditionality of response time effects. It is the case that dispatch is more important than deployment and that response time is important for active crimes, but not for passive crimes. These are predictions that an explanation based solely on organizational or institutional theory cannot generate. Institutional theory explained, however, why previously equivalent response times resulted in different outcomes across different area commands with different staffing ratios, governance and community trust “banks.” Neither of the two theoretical traditions is able to explain the entire set of results; their combination provides more “architectural” explanatory power than any of the traditions provides on their own.

The Lagos findings also delineate further the legitimacy dimension of institutional theory. The weak, but positive correlation of institutional trust with crime and the trust variable in the clearance regression being marginally significant suggests that legitimacy is present as a contextual condition rather than as a causal mechanism. It is possible that in area commands with higher public trust the police have access to more and better information, more willing witnesses, and more cooperative and less passive victims, thus increasing the likelihood of clearance, irrespective of response time. This explanation coincides with NASEM (2022), but it also adds that in low trust environments the marginal deterrence effect for response time is likely to be even lower.

Practical and policy implications

Some policy implications can be drawn from these findings.

Focus first on dispatch systems. The consistent result that dispatch time has a much larger effect on crime outcomes than deployment time suggests that it makes the most sense to focus effort on improving call prioritization, dispatcher training, and communication systems at area command control room dispatchers. Given

the severe traffic congestion that limits deployment speed in Lagos, improving pre-travel time delays is likely to be the most impactful.

Resource distribution based on the nature of the call is vital. Setting uniform speed targets is a resource drain. For certain call types, speed is a non-important resource. In a typical progressive incident, optimally quick dispatch is needed. In a retrospectively reported incident, however, an investigatory and follow-up framework is needed, not a quick patrol. Lagos policing does not allocate resources in this way.

Your Organisation has to reform before Staffing becomes a quantitative problem. The officer to population ratio was the single most powerful predictor of variability in response times. Until the chronic personnel deficit is resolved, any improvements to dispatch systems, and the subsequent technology upgrades have little to no effect on the personnel side.

Governance needs to be in place before technology can be applied. The crime outcome technology adoption impact suggests that timely responsive dispatch and surveillance apparatus adoption should be accompanied by accountability, engagement and trust building in the community. The Trust Deficit in low trust areas is a significant operational focus and misplaced effort.

Limitations

The cross-sectional design of the study prevents longitudinal reasoning with the survey data and due to the possibility of reverse causation or omitted variable bias with the organizational variables and response time. Although the volume of incident record data is large, the data, like other administrative data, suffer from the Nigerian policing context. Consequently, the 8.4% missing data introduces potential bias, regardless of the fact that the missing data is non-systematic. Measures of organizational capacity and institutional trust that rely on self-reports suffer social desirability bias, especially given that police officers are reporting on their own institutions. The study is geographically limited to Lagos, Nigeria and therefore offers limited, if any, generalized findings to other Nigerian states or in rural police contexts with structurally different conditions other than Lagos. While Cronbach's alpha values are acceptable, they can be improved which suggests that the measurement can be more precise with further instrument refinement.

Conclusion

In Lagos, police response times provide insight into crime clearance and arrests, and the likelihood of injury to crime victims, functioning from a deterrence theory perspective on the predictive power of response time and certainty in police presence. While the impact of police response time certainly exists, it is call-type specific, and phase specific and is mediated organizationally in ways that go beyond simplistic time benchmarks. A reduction in dispatch time is also more beneficial than reduction in response time. Time is of the essence when crime is in progress, but when it is a report that is made afterward then that time is irrelevant. Most of the differences in response time that can be observed from one subdivision to another is a result of the command structure, particularly the ratio of available officers to the supervisors and the quality of the dispatch.

The alignment of these patterns with findings from the policing context of the United States, the United Kingdom, and the Netherlands is indicative of the fact that, despite the fact that these settings are marked by severe organizational constraints, there are still fundamental mechanisms that link response time to crime outcomes. Lagos also experiences a unique set of governance conditions that dictate the operational deficits and organizational constraints that impact response time and crime outcomes.

This research generates several priorities. For example, longitudinal/quasi-experimental studies that leverage exogenous variation in response time in the Lagos context, would provide stronger causal inference than the current cross-sectional data allows. In addition, longitudinal/quasi-experimental studies that capture the organizational determinants outlined here across Nigerian states and other African urban contexts would help clarify whether the dispatch-deployment asymmetry exists in varying levels of infrastructure. Until further studies are carried out, the current findings are the best available evidence in sub-Saharan Africa on police response time and crime deterrence.

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