When the Denominator Makes a Difference: Reanalyzing the Police Killing Finding from Lewis & Usmani (2022)

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Abstract

Lewis and Usmani (2022) reported that police killed fewer people in countries with more police officers per homicide. They presented a bivariate graph with data on 48 countries showing a clear negative correlation between a country's policing footprint and its rate of police killings. This counterintuitive result has received widespread media attention. The study's measure of policing, however, is non-standard. The authors divide each country's police officers by its number of homicides, not by the typical denominator, population. The current paper reanalyzes their data using the standard measure, officers per capita, and finds no detectable relationship between a country's number of police officers and its number of police killings. Then, the paper decomposes police officers and homicides in a regression model, finding that homicides are strongly and positively correlated with police killings. Police staffing, in contrast, shows no detectable relationship to police killings and explains little of the outcome's variation. Results suggest the homicide denominator, not the police officer numerator, was responsible for most of Lewis and Usmani's (2022) police killing finding.

Keywords: police killings, police staffing, cross-national comparison, ratio variables

In a 2022 study, Christopher Lewis and Adaner Usmani (hereafter L&U) found that police killed fewer people in countries with more police officers per homicide. The study collected data on 48 countries, plotting each nation's police per homicide against its police killing rate on a bivariate graph[1]. The graph showed a clear downward slope. Countries with more police per homicide had fewer police killings and countries with fewer had more. L&U acknowledge this finding is counterintuitive and attribute it to police in under-staffed countries being overwhelmed by violence and therefore resorting to killing people in "shows of spectacular force." Police

[1] The study appeared in the *American Journal of Law & Equality*, a journal covering "legal issues involving equality and discrimination" and staffed by Harvard Law School faculty and students. The journal has at least two faculty editors review each submission and does not use external peer review (American Journal of Law and Equality, n.d.; Williams, 2024).

"struggle to keep pace with rates of interpersonal violence" and therefore "behave brutally out of regard for their own interests" (Lewis & Usmani, 2022, p. 94). In L&U's account, police are attempting to deter violence with insufficient resources. L&U describe the United States as one such under-policed country and write, "We take this negative correlation as supporting our expectation that a United States with more policing would be a United States with fewer rather than more police killings" (Lewis & Usmani, 2022, p. 93). L&U acknowledge the limitations of their method, noting that their "data are poor" and "a negative correlation is not proof that lower levels of police/homicide *cause* the police to be more violent" (p. 94, emphasis in original).

This finding, that countries with more policing have fewer police killings, has garnered considerable media attention. L&U (2022) was featured in *National Review*, *The Atlantic*, and *New York* magazine, as well as newspapers and blogs (Gladwell, 2026a; Levitz, 2023; Pino, 2022; Tabarrok, 2022; Tice, 2022; Williams, 2024). In his best-selling book, journalist Malcolm Gladwell praised L&U (2022) as a "brilliant study" (2026b, p. 49), and promoted it in interviews with *the New Yorker*, *Time* magazine, Oprah, Fox News Radio, and Katie Couric (Anthony, 2026; Couric, 2026; Luscombe, 2026; Remnick, 2026; Winfrey, 2026). The media accounts largely omitted description of the methodological and data limitations that L&U describe.

In addition to the noted limitations, the widely disseminated finding rests on an unusual measure of police personnel. The typical method for measuring police force size is to divide a place's number of officers by its population. This standard per capita measure allows for comparisons across places of different sizes. Numerous studies, including those in economics, criminology, sociology, and public health, have used this police per capita measure (e.g., Adams et al., 2023; Beck et al., 2024; Chalfin et al., 2020; Levitt, 2002; Schwartz & Jahn, 2020). The National Academies of Sciences report on proactive policing used it (Weisburd & Majmundar, 2018). Instead of denominating police staffing with population, though, L&U denominate it with homicides. They divide police officers in a country by its number of murders. I could not find many examples of this approach. Google Scholar queries for "police per capita" and "police per 100,000"

returned about 1,700 and 1,100 results, respectively. A search for “police per homicide” returned three results, one of which was L&U (2022). These search counts are crude but illustrative.

In L&U (2022), the authors explained their atypical denominator choice this way:

> [I]t is more informative to denominate punishment and policing by the level of serious crime in a country. By doing so, it is possible to make inferences about cross-national differences in how countries manage serious crime (Lewis & Usmani, 2022, p. 87).

Elsewhere in their article, L&U describe police per homicide as operationalizing the “footprint of the police” (p. 91). One could extrapolate from these explanations that homicides are among the most crucial events a police department addresses. In order for police departments to keep communities safe, this thinking might go, police need the capacity to do so. Countries need sufficient staffing relative to their homicide case load. Without this capacity, their officers can’t help but be overwhelmed and react to their communities with violence. So, it follows that denominating officers by their most critical case load (homicide) tells us something about, as L&U write, “how countries manage serious crime” (p. 87). L&U also write that homicide is a good proxy for overall serious crime because its definition varies little between countries. They do not define “serious” crime or provide evidence that homicide is a good proxy for it.

There are two problems with a homicide denominator. First, it is not a good benchmark for police capacity because investigating homicides is a small part of what police do. Chicago, for instance, employs 128 homicide detectives out of 13,352 officers, less than 1% of the uniformed workforce (Police Executive Research Forum, 2019). In Philadelphia, only 1 out of every 5,000 incidents to which police respond is a homicide (Ratcliffe, 2017). Even if homicide proxied overall serious crime, serious crime investigations are rare police actions compared to much more common activities like making low-level arrests, appearing at traffic accidents, and responding to false burglary alarms. These less spectacular occurrences are the bulk of policing, and they largely determine the frequency of police-public interactions that could lead to a fatal police encounter.

Second, putting homicide in the denominator means that higher values of homicide will lower the overall police per homicide ratio, and lower values will raise it. If countries with more homicides, then, also have more police killings, the ratio could produce a downward slope even if police staffing has nothing to do with police killings (Decker & Kohfeld, 1985; Gibbs & Firebaugh, 1990). A country's ratio can be low either because it has few police or because it has many homicides, so the ratio treats these two situations as interchangeable. L&U's approach assumes that a 1% increase in police staffing and a 1% decrease in homicide have the same relationship with police killings. I test whether this assumption holds below.

A population denominator is much more commonly used because it describes many more elements of a place's context. Crucially, it captures the number of people who can be police officers and who can be killed by police. This makes it a better measure of the encounters that could lead to a police killing. L&U acknowledge its utility when they use it to denominate police killings. What if we use the more typical officers per capita measure instead of officers per homicide? Does that change L&U's (2022) finding that police staffing and police killings are negatively correlated?

Data and Methods

To address these questions, I followed the data and methods of L&U (2022) whenever possible. L&U generously and publicly shared the data underlying their study (Lewis & Usmani, 2026). Their data on police staffing, homicides, and population come from the UN Office on Drugs and Crime (UNODC). Their data on police killings comes from the Wikipedia page "List of countries with annual rates and counts for killings by law enforcement officers" which gathers data from various national sources (Wikipedia, 2026). L&U (2022) describe their study as covering "the period spanning 2015 and the latest data available." The publicly provided data includes a variable called "period," the value of which for every country is "post1996." I assume this change in dates is part of what they updated before sharing the data. I also assume they averaged together every year between 1996 and the latest available for any country with multiple years of data. L&U logged

all variables, so I do the same. Some countries have zero police killings, so they and I added 0.1 to all countries' police killing counts before calculating the rate and then the base-10 logarithm.

Results

Using this data, I recreated their Figure 5, the source of their major finding. It appears as this paper's Figure 1A and shows a clear downward slope. A correlation test confirms a strong negative relationship ($r = -0.76$, $p < 0.01$). Countries with more police per homicide have fewer police killings. After reproducing their plot, I next reanalyzed the data using population as the denominator for police officers. This is visible in the second graph, Figure 1B, which replaces the horizontal axis variable. Here, we see the negative correlation is strongly attenuated. The line is considerably more flat. A correlation test reveals that the relationship between police per capita and police killings is no longer statistically significant ($r = -0.10$, $p = 0.49$). We also see that most countries are bunched up on the right side of the distribution. Figure 1C removes the far-left outliers, Syria and Rwanda. Now, the slope turns positive, though it is still not statistically significant ($r = 0.12$, $p = 0.43$). To determine whether the police per homicide denominator was correlated with the police killing outcome, Figure 1D replaces the horizontal-axis variable with homicides per capita. Here, we observe a strong positive relationship ($r = 0.80$, $p < 0.01$) with tight clustering around the line of best fit. This graph is almost the mirror image of L&U's figure (Figure 1A). Figure 1D provides some early evidence that L&U's police per homicide denominator accounts for at least some of the negative correlation they observe. In summary, when the typical per capita denominator for police staffing is used, countries with more officers have neither more nor fewer police killings than countries with fewer officers. The headline finding from L&U (2022) is sensitive to their unorthodox measurement decision.

[Figure 1 about here]

Choosing between homicide and population denominators is not necessary, however. L&U use a bivariate graph, but representing four variables (police killings, population, police officers, homicide) with such a limited plot is unnecessarily restrictive. Ordinary least squares

(OLS) regressions can easily separate the relevant relationships. In the next analyses, I present OLS regression model results that mirror the graphs above, but now without forcing all the variables into just two axes.

The first column in Table 1, Model A, reflects L&U's figure. As expected, it shows a negative relationship. All the variables in these models are logged, so the coefficients can be interpreted as elasticities. Model A shows that countries with 1% more police per homicide have 1.1% fewer police killings per capita. Next, Model B decomposes police per homicide into its two parts, police and homicide, and denominates both by population. It shows that police and homicide have opposite relationships to police killings. Police staffing's coefficient is negative (-0.45), though not statistically significant. Homicides are strongly, positively, and statistically significantly associated with police killings. The next column, Model C, shows that when the outliers, Rwanda and Syria, are dropped, the police-per-capita measure turns positive, though it is still not statistically significantly different from zero. This model suggests countries with 1% more homicides have 1.32% more police killings. The final model, D, includes homicide only. Notable about this homicide-only model is its R-squared value of 0.64. Homicide explains 64% of the variation in police killings. Comparing that to the R-squared of Model B, we see that including police staffing in the model contributes only 3 percentage points to explaining variation in police killings (0.67-0.64=0.03). Homicide explains much more of the variation in police killings than police staffing. Comparing Model D's R-squared to that of Model A, L&U's approach, we see that homicide *alone* outperforms police per homicide (0.64 vs. 0.58). Combining police staffing with homicide in a single measure reduces explanatory power.

[Table 1 about here]

Taken together, the coefficients and R-squared values provide evidence that the negative correlation between police per homicide and police killings that L&U observe is driven more by police per homicide's denominator than its numerator. L&U interpret their observed negative correlation as representing something about the "footprint of the police" and "policing" writ large

(pp. 91, 93), but the results here suggest it would be more accurate to interpret the negative correlation as representing something about homicide.

As mentioned above, the homicide denominator assumes police staffing and homicide have equal and opposite relationships with police killings. To test this linear restriction, I calculated whether the staffing and homicide coefficients in Model B add to zero, and they did not (-0.45 + 1.32 = 0.87). A Wald test confirms the sum's difference from zero ($F = 6.63$, $p = 0.013$)[2]. Homicide's positive relationship with police killings is much stronger than police staffing's negative one, so combining them in one ratio assigns to police staffing a relationship that belongs mostly to homicide. Countries high in homicide are also high in police killings, but that tells us little about police staffing.

Discussion

The purpose of this reanalysis is not to provide better estimates of global police killings. Even the decomposed OLS analysis presented here is likely underspecified. This rudimentary approach includes only 48 countries measured at one point in time. It has no data on 146 other countries, nor a measure of how countries changed over time. It has no control variables to account for the considerable differences between countries like Syria, Hong Kong, and Luxembourg[3]. A more thorough approach would likely want to account for other variables that affect a country's police killing rate, like its wealth, demographics, welfare-state generosity, police training practices, history of civil war, etc. (Hirschfield, 2023). These would need to be controlled for to isolate the effect of police staffing on police killings. The usual difficulties with cross-national comparisons are further compounded in this context by the unique difficulty of counting police, the definition of which varies across borders. Scholars debate whether counts of police should

[2] The population denominator has a different but related assumption: that once all variables are measured per capita, the population has no additional explanatory power. Adding population to Model B and running a Wald test finds the population coefficient is not different from zero, supporting the assumption ($F = 1.14$, $p = 0.29$).

[3] L&U (2022) write, "[w]e exclude countries with small populations such as Luxembourg" (p. 86), but Luxembourg is visible on their Figure 5 and is in the data they posted online.

include civilian police staff without arrest powers, immigration enforcement officers, domestically deployed soldiers, armed private security, rural sheriffs, federal drug enforcement, etc. (Grumbach et al., 2025). L&U do not deal with these nuances, and I do not either. The purpose of this reanalysis is not to provide a better measure of global police killings, but rather to illuminate how a highly publicized finding hinges on a non-standard measure and misattributes the observed negative correlation to the measure's numerator. More sophisticated methods than those provided here are needed to understand police killings.

Fortunately, there are many studies that use more rigorous methods to assess the relationship between police staffing and police killings. I could find none that come to the same conclusion as L&U (2022). Neil et al. (2025), for instance, used Bayesian multilevel models with a raft of covariates and found U.S. cities with fewer officers per capita had fewer fatal police shootings. Two studies, also of U.S. cities, used negative binomial models with covariates and found no relationship between police per capita and police killings (Beck, 2023; Dirlam, 2025). Chalfin et al. (2020) use a causal, instrumental variable design and find each police officer hired leads to an increase in the number of Black people killed by police, though hiring additional officers has no effect on killings of white people. None of these studies are cross-national, though. The difficulty of comparing police staffing across countries is considerable, and the bivariate graph used by L&U (2022) is likely insufficient.

L&U recognize some of this insufficiency when they note their "poor" data and frame their conclusion as speculative (p. 94, 100). L&U write that they "guess that a world of more policing would be one of less police violence" (p. 101). The reanalysis here finds that their guess was wrong.

Data Availability Statement

The data analyzed in this study are publicly available. L&U's (2022) replication data are posted at https://github.com/ausmani23/miwhatswrong. The Stata syntax to reproduce the figure, table, and tests in this article is available on the Harvard Dataverse at: https://dataverse.harvard.edu/previewurl.xhtml?token=88e56041-013c-4ea7-969e-ee2d4c4fdc0d.

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Figure

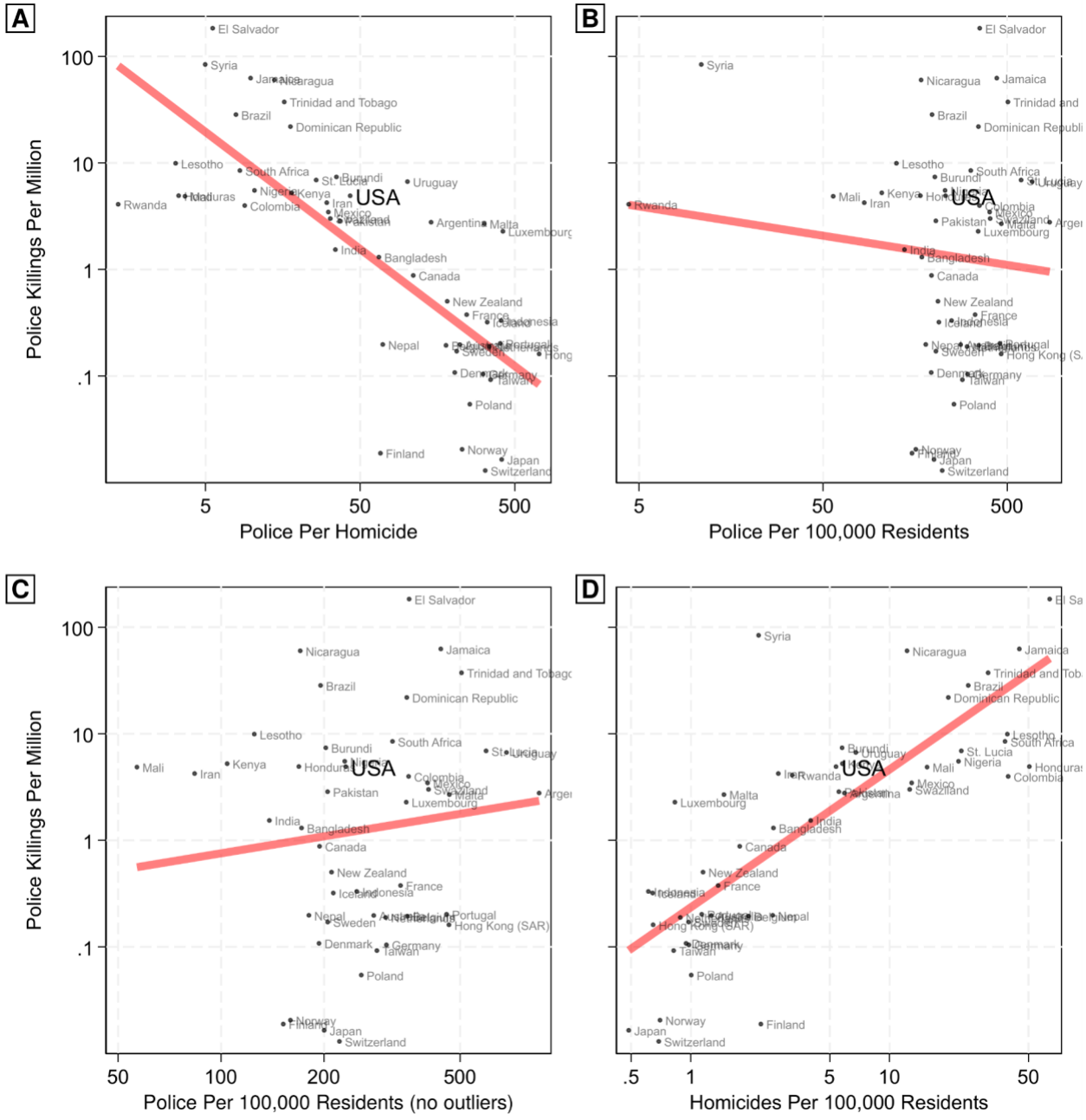


Figure 1. Reproduction of Figure 5 from Lewis and Usmani (2022) (Panel A) and three reanalyses.

Table

Table 1. OLS regressions predicting police killings per capita (log)

	A. Police per homicide	B. Decomposed model	C. Outliers dropped	D. Homicide only
Police per homicide (log)	-1.10***			
	(0.15)			
Police per capita (log)		-0.45	0.28	
		(0.31)	(0.33)	
Homicides per capita (log)		1.32***	1.32***	1.29***
		(0.14)	(0.13)	(0.13)
N (Countries)	48	48	46	48
R-squared	0.58	0.67	0.72	0.64

*** p<.001, ** p<.01, * p<.05

Outcome is logged police killings per capita. All variables are logged. Robust standard errors are in parentheses. The outliers-dropped model excludes Rwanda and Syria.

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