

Online appendix: Civilian police size and quality in northern states

Notebook: Dissertation Online Supporting Materials

Created: 07-Mar-22 3:09 PM

Updated: 17-Mar-22 5:51 PM

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This document supplements my 2022 PhD dissertation, specifically Chapter 5 and the Appendix to Chapter 5.

Last update: 17 March 2022.

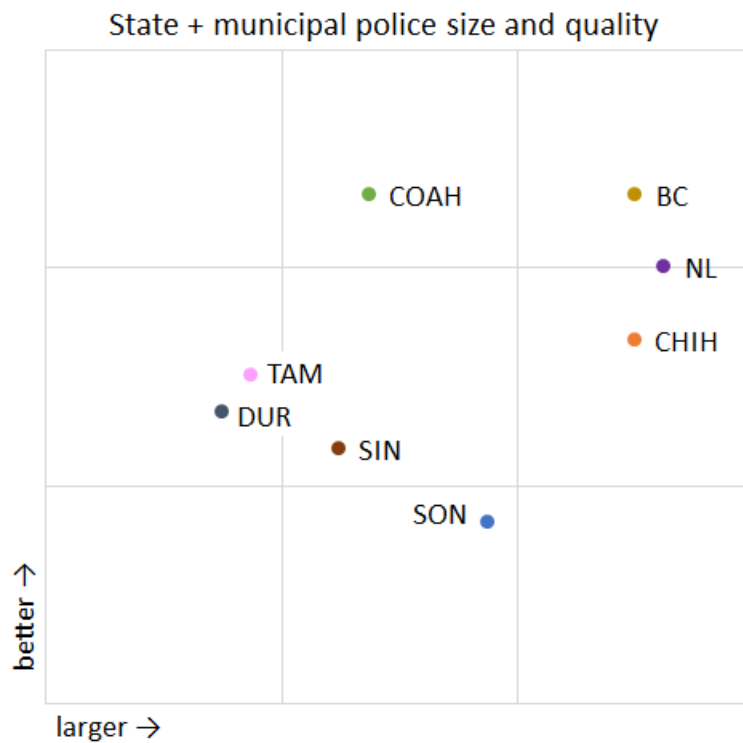
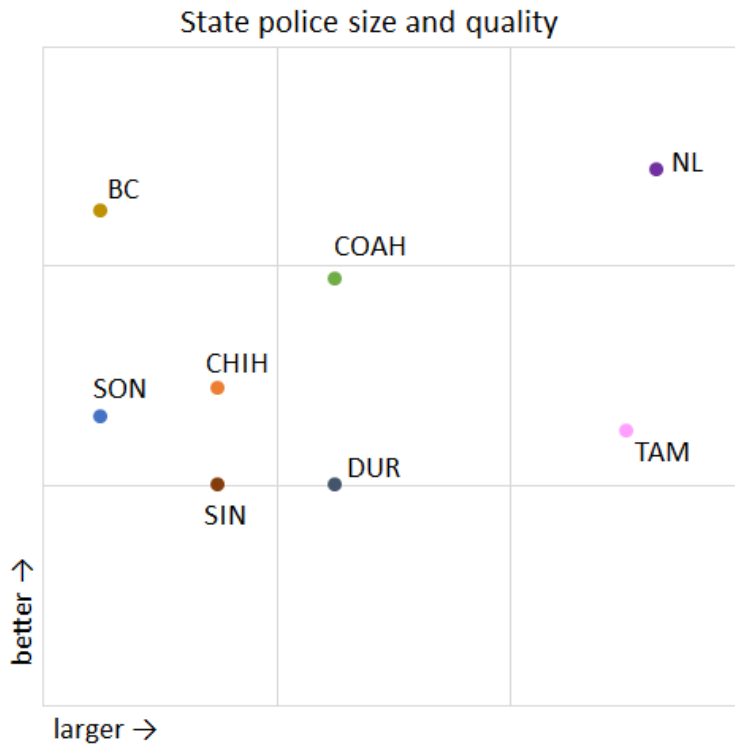
How to cite:

Signoret, Patrick (2022). "Online appendix: Civilian police size and quality in northern states." *PhD dissertation*, Princeton University, May 2022. <http://www.patricksignoret.com/research>.

Introduction

Chapter 5 of my dissertation compares criminal dynamics, the security apparatus, and violence trajectories across eight northern states and their 21 largest cities; Section 4.2 of that chapter compares the capacity of police forces in those states as estimated by their size and "quality". Measuring police strength at the state level can be achieved along multiple dimensions: by the number of personnel involved in public safety, by the quality of institutions and personnel, or by total spending on public security and criminal justice. Moreover, we may focus on state institutions alone or also on the strength of all police bodies in a state, including municipal ones. Each measurement has advantages and disadvantages, and each has data that varies in quality and availability. The main text of the dissertation collapses all measurements into an overall summary assessment for each state, visualized in Figure 43 (pg 298). Here is a version of those plots:

Figure A. State police size and quality for state institutions (first) and state plus municipal institutions (second)



With or without municipal police forces inclusion, **Nuevo León** had among the most capable police apparatuses in the region, **Durango** and **Sinaloa** had among the least capable, and **Coahuila** was in the middle of the pack. **Baja California**, **Chihuahua**, **Tamaulipas**, and **Sonora** fared differently depending on whether municipal police were included or not, though Baja California had (relatively) top-quality police in both cases.

The Appendix to Chapter 5, Section B.1 (starting on page 405), describes the measures that went into the summary graphs above. Two indicators

relate to the size of police forces by number of personnel and amount of spending, both weighed by each state's population. Four indicators describe the potential quality of state police forces regardless of size: average spending per public security personnel, average salary per police officer, percentage of personnel who passed vetting procedures, and an index of police institutional quality. For each measure, I compared each of the eight states to each other and to national averages. I carried out this exercise both for state institutions alone—state police and investigators, excluding municipal police—and with municipal police included. To visualize these attributes as in the plots above, I assigned 1 point to small/poor measures, 2 points to medium, and 3 to large/good, with small penalties or bonuses depending on whether they are above or below the national average. The value for each dimension (size and quality) is a simple average of its components, with values fluctuating slightly depending on whether they are above or below the national average.

Table A below focuses solely on state public security and investigative/prosecutorial institutions. Colored cells point out states that are particularly strong (green), weak (red), or in between (yellow) compared with each other. The signs next to each color directly compare outcomes to national averages: whether police forces were better (+), about the same (·), or smaller/worse (-) than those in the rest of the country.

Table A. Measures of state police capacity (state institutions)

	State police capacity					
	Size		Quality			
	Size	Spend per cap	Spend per staff	Spend per cop	Vetting	Indepol
	2012-2017	2014-2018	2014-2018	2012-2017	2013-2018	2015-2017
Baja Calif.	small -	low -	med +	high +	reg +	good +
Chihuahua	med -	low -	low +	med +	reg +	med ·
Coahuila	med -	med -	med +	med +	strong +	med ·
Durango	med -	med -	med +	med +	weak -	bad -
Nuevo Leon	large ·	high +	med +	high +	strong +	good ·
Sinaloa	med -	low -	med +	med +	weak -	bad -
Sonora	small -	low -	med +	med +	reg ·	bad -
Tamaulipas	large -	high +	high +	low -	weak ·	med ·

In Table A above, a glance at the signs comparing states to national averages tells us that, as a region, northern state police forces were generally smaller and better paid, while vetting and institutional outcomes were mixed.

In terms of each state, the easiest case is **Nuevo León**, whose state police were in the top tier of both indicators of size and three out of four indicators of quality, and were consistently either at about the same level or larger/better than the rest of the country. It is alone in the top right quadrant of dissertation Figure 43, meaning that it averaged in the top tier of the eight states along both dimensions. Moreover, all of Nuevo León's indicators trended up at least through 2014 and often all the way through 2017-2018 (trends not shown in the table or figure). **Tamaulipas**

was the other large state police force in the region, but had mixed quality indicators (with none improving across time). In an almost symmetrically opposite quadrant was **Baja California**, which had a small state police force by all measures but was above average in all quality indicators and in the top tier in terms of salaries and institutional design and practices. Somewhere in between was **Coahuila**, with a medium-size police (smaller than the national average), quality indicators ranging from average to outstanding, and several indicators trending up. No other state police force stood out as particularly capable on any dimension. **Durango** had a medium-size police force (smaller than the country average) but middling or poor quality indicators. **Chihuahua**, **Sinaloa**, and especially **Sonora** had small state police forces without any strong showing in terms of quality, though some of their quality indicators were above average nationwide.

When states' municipal police are included, the picture of combined police capacity changes for some states but not others. Two clusters are easy to compare to each other. In one cluster of both large and high-quality police forces are **Baja California**, **Nuevo León**, and **Chihuahua**, all with large police forces in terms of both personnel and spending per capita, and all with regular or good quality indicators (and above the national average in terms of spending per police officer). On the other end are **Tamaulipas**, **Durango**, and **Sinaloa**, dominated by the first cluster in terms of both size and quality. That leaves **Coahuila**, a mid-sized but top-quality police force in the region, and **Sonora**, whose combined police forces were larger than those of Coahuila and the three bottom-tier states but which had the worst quality indicators.

Table B. Measures of state police capacity (state institutions)

	Combined state and municipal police capacity									
	Size					Quality				
	Size		Spend per cap		Spend per staff		Spend per cop		Vetting	
	2012-2018	2016 & 2018	2016 & 2018	2012-2018	2016 & 2018	2012-2018	2014 & 2016	2014 & 2016		
Baja Calif.	large	—	high	+	high	+	high	+	reg	—
Chihuahua	large	—	high	+	med	+	med	+	reg	—
Coahuila	med	—	med	·	med	+	med	+	good	+
Durango	med	—	low	—	low	·	med	+	reg	·
Nuevo Leon	large	·	high	+	med	+	high	+	reg	—
Sinaloa	large	—	low	—	low	—	med	+	reg	·
Sonora	large	—	med	·	low	·	med	+	bad	—
Tamaulipas	small	—	med	·	high	+	low	—	reg	·

Together, the numbers with and without municipal forces suggest that **Baja California**, **Chihuahua**, and **Sonora** seemed to depend heavily on municipal police, with the first two having not only large but also relatively high-quality police, while **Sonora's** municipal police were relatively plentiful but badly paid and vetted. On the other hand,

Tamaulipas's policing capacity depended almost entirely on its state police (in fact, it phased out its municipal police from 2011 to 2013).

So far I have summarized what is in the dissertation (Chapter 5 and the appendix to that chapter). The rest of this document now walks through each of these pieces of data with annual or bi-annual data, now including changes across time. First, some notes on the sources of data and how I operationalized the variables.

Data

- Most data is compiled from three national statistics office (Inegi) surveys of local governments: annual surveys of state public security institutions and state justice institutions and a bi-annual survey of municipal governments. Though most of these censuses began in 2011 (some even earlier), questionnaires and reporting quality did not settle until 2013 (with data from 2012), so I present results from 2012 to 2018, which coincides with the period of post-turf war trajectories on which I focus. The Inegi data is complemented by an assessment of state police institutional quality by think tank Causa en Común for 2015-2017. My comparisons focus on the eight northern states, though as reference I also provide data for the eight states together ("Northern Mexico"), Mexico City, and the rest of the country.

Definitions

- *Police (narrow)*. Preventative police: “regular” uniformed police officers. Excludes traffic police and investigative personnel (detectives, forensic technicians, etc.).
- *Police (broad)*. Total number of personnel in public security institutions excluding administrative staff. This may include other police units such as traffic or corrections officers, but still does not include what I call “investigative” staff, which are mainly based in state attorney’s offices. Public security personnel are state employees working for state public safety departments (often but not always called Secretaría de Seguridad Pública), and they can include uniformed police, prison guards, other special police or guard forces, and analysts.
- *Police and investigators (narrow)*. Preventative police plus the detectives charged with investigating crimes and carrying out arrests (“policía ministerial” or “policía investigadora”), who are based in the state attorney general office (Procuraduría/Fiscalía General de Justicia).
- *Police and investigators (broad)*. Non-administrative public security personnel plus non-administrative personnel of ministerios publicos, the local offices were detectives, criminalists, law clerks, and prosecutors are based.

- *Spending per capita*. Spending on public security as reported by state governments (since 2014) or municipal governments (since 2016).
- *Spending per staff*. Total state spending on public security (as above), but now in terms of the spending per individual involved in such activities. Higher average spending per personnel might indicate higher wages offered and thus higher quality personnel, or better equipment and training per personnel.
- *Spending per cop*. Inegi's public security censuses ask state and municipal governments to classify their personnel in terms of payroll categories (e.g. "number of personnel earning between 5,000 and 10,000 pesos per month"). I aggregate this payroll data, then divide by the number of police to obtain a weighted average annual salary per officer.
- *Vetting*. A national 2009 law required federal, state, and municipal public security and criminal justice personnel to pass regular vetting procedures called "confidence control exams" (controles de confianza) to determine whether they were fit for duty, with a (twice-extended) deadline for screening all personnel set for 2014. Owing to spotty data and unclear criteria, I constructed three-year rolling sums of vetted personnel and compared it with the current year's police force size. This is measure potentially double-counts officers who were certified twice over the three-year period (which was the initial rule for public security personnel before it was relaxed to three years) and potentially counts officers who were vetted but no longer remained on the force. Still, it allows us to compare across states and provides a floor, 100%, below which we can be certain that police forces were not fully vetted.
- *Indepol*. This is the Spanish acronym for the Police Development Index (Índice de Desarrollo Policial) produced by Causa en Común, a non-governmental organization focused on measuring and improving police institutional performance. This index evaluates the rules, policies, procedures, and installations of state police institutions. Two indices were available for our period of interest: one based on 2015-2016 data and another based on 2017 data.

Police size: personnel

Summary

I compare police force size across space and time by providing levels per 100,000 population. Let us begin with state-level institutions. Table X shows different counts of personnel in public security institutions, where darker greens indicate higher relative values. Public security personnel are state employees working for state public safety ministries (often but not always called *Secretaría de Seguridad Pública*), and they can include

uniformed police, prison guards, other special police or guard forces, analysts, and administrative staff.

Table C. State public security and criminal justice personnel

	Police (narrow)						Police (broad)						Police and investigators (broad)					
	SegPub preventative police						SegPub total excl. admin						SegPub total excl. admin + Ministerios					
	2012	2013	2014	2015	2016	2017	2012	2013	2014	2015	2016	2017	2012	2013	2014	2015	2016	2017
Baja California	20	20	18	19	18	18	19	19	18	18	18	18	49	50	57	54	65	74
Chihuahua	25	25	31	32	35	36	43	41	46	57	50	50	106	70	78	91	81	114
Coahuila	23	29	45	47	55	53	21	31	45	49	55	53	37	77	84	66	85	90
Durango	28	36	48	51	48	44	28	38	49	51	49	44	107	98	85	92	100	83
Nuevo Leon	78	90	101	99	102	93	78	90	101	99	102	100	104	117	128	128	114	111
Sinaloa	21	18	24	26	28	22	19	23	22	26	59	64	38	42	38	44	80	85
Sonora	33	32	30	28	28	27	33	33	30	28	29	29	56	56	52	45	43	51
Tamaulipas	35	48	70	71	64	80	45	56	78	78	72	92	67	80	99	102	105	122
NORTH	36	41	50	51	51	51	40	45	53	55	58	61	72	76	82	82	86	94
MEXICO CITY	440	431	362	363	359	350	889	901	913	897	902	892	955	962	976	959	964	960
REST OF COUNTRY	69	76	78	83	81	70	109	119	116	114	117	105	139	151	145	143	148	139

Overall in the north, state police forces increased in size from 2012 to 2018, though as a region they were smaller than the rest of the country. Specifically, the number of public security and/or investigative personnel per capita trended up in Chihuahua, Coahuila, and Tamaulipas (and Nuevo León until 2014, Sinaloa according to one measure, and Baja California when including investigative personnel).

In the first half of this period (2012-2014), Nuevo León had the largest police force, Tamaulipas and Coahuila were quickly catching up, and Chihuahua and Durango started strong by one measure but shrank thereafter. Baja California, Sinaloa, and Sonora had relatively small state police forces by all measures. In the second half of this period (2015-2018), Nuevo León and Tamaulipas had the largest state police forces by all three measures, with Chihuahua, Coahuila, Durango, and perhaps Sinaloa in that top tier by 2017 only when including investigative and prosecutorial personnel from the state attorney's office. Baja California had a much more robust ministerial police than preventative police force, and it grew over time, but it was still the second smallest combined state police force in the region. Sonora had the smallest police force in the region by any measure, and its trend was downward if anything.

Table D shows the same police force measures but now includes all municipal police present in each state. Overall, combined municipal and state police forces remained smaller than those elsewhere in the country, and showed no common growth pattern. **Nuevo León's** police forces increased in size from 2012 to 2014, then stopped growing, and the same was true to a lesser extent of **Baja California** and **Chihuahua**. The opposite happened in **Durango**. In **Sonora**, where combined police forces were the largest in the region, those forces shrank in size at both the state and municipal level according to all measures. **Tamaulipas** saw its police forces shrink after 2012 and grow again after 2016.

The gaps between states in police force size were narrower when municipal police forces were included. In other words, states with

relatively large state police forces tended to have fewer municipal police, and vice versa. **Tamaulipas** is the clear outlier, with significantly fewer police than the other states especially after it disbanded its municipal police forces by 2013. By all three measures, **Coahuila** and **Durango** were in the next smallest tier. **Baja California, Chihuahua, Nuevo León, Sonora,** and **Sinaloa** were in the top tier in terms of combined police personnel, though Sinaloa's combined police shrank after 2016 and Sonora's shrank considerably from 2012 to 2018.

Table D. State and municipal public security and criminal justice personnel

	Police (narrow)				Police (broad)				Police and investigators (broad)			
	Segpub preventative police				SegPub total excl. admin				SegPub excl. admin + Ministerios			
	2012	2014	2016	2018	2012	2014	2016	2018	2012	2014	2016	2018
Baja California	166	178	163	159	213	224	213	209	243	263	259	268
Chihuahua	168	189	186	155	181	242	248	235	245	274	279	300
Coahuila	126	138	149	134	117	132	154	145	133	171	184	183
Durango	131	117	123	126	147	146	158	166	226	182	210	205
Nuevo Leon	162	210	210	210	205	250	233	250	230	277	245	260
Sinaloa	175	167	150	124	213	186	217	194	232	203	238	209
Sonora	215	182	176	156	242	216	208	196	265	238	221	222
Tamaulipas	110	70	65	80	144	91	91	134	166	112	125	168
NORTH	158	162	158	150	186	193	195	198	218	222	223	232
MEXICO CITY	440	362	359	350	889	913	902	883	955	976	964	932
REST OF COUNTRY	203	202	205	187	272	270	263	247	302	299	295	281

Narratives: state institutions only

As a region, these eight states saw their state police forces increased in size every year across most measurements. Only the narrowest police force definition (top left) shows police force size stalling after having grown from 2012 to 2014.

- **Baja California** had a consistently small preventative police force but a solidly growing investigative force that led its police-plus-investigative force to grow by 50% from 2012 to 2017.
- **Chihuahua** seems to have shed a large part of its police force from 2012 to 2013, but all measures of police size trended up thereafter, and its investigative force shot up in 2017. [Footnote: The numbers for 2018, not shown here because they weren't available for all four measures, show that the high 2017 numbers held up in 2018 as well.] If its extraordinarily high 2012 and 2017 numbers can be believed, its police forces were among the largest in the region in those two years but middling from 2013 to 2018. Though the dramatic fall from 2012 to 2013 and dramatic rise from 2016 to 2017 raise the suspicion that personnel was not consistently counted across years,
- **Coahuila's** preventative and investigative police forces grew consistently every year from 2013 to 2016, ending with a about double or triple its size, depending on the measure. From 2012 to

2014, the size of its police forces went from ranked 6th-8th to being ranked 4th-5th (then was ranked 3rd or 4th by 2017).

- **Durango's** police forces did not grow consistently. From 2012 to 2014, its preventative police grew, while its apparently large investigative force shrank, leading to a net decline in absolute terms and compared with other states, going from having the first or second largest joint preventative-investigative force in the region to about the third or fourth largest.
- **Nuevo León's** state police force, already the largest in the region in 2012, grew by all measures through 2014, then remained at that high level without growing any further.
- Across most measures, **Sinaloa** had a small police force that fluctuated without a clear pattern from 2012 to 2017, consistently ranked as one of the smallest in the region (with as little as a third as many state personnel as the rest of the country outside Mexico City). This was the case for all years for the two narrow measures of preventative and investigative police. According to the broader measures, the size of its state police force roughly doubled from 2015 to 2016, bringing its size in line with other northern states. (As we will see below, that increase seems to owe to a temporary centralization of police forces in the state bringing municipal police under state command in 2016 and 2017, leaving the combined number of local police in the state unchanged or even lower.)
- **Sonora's** state police force was not only relatively small, ranked among the top three smallest across all years and measures, but also trended down no matter how its personnel were counted.
- **Tamaulipas's** state preventative and investigative police, on the other hand, increased in size every year from 2012 to 2017, jumping particularly strongly from 2013 to 2014 as the state and federal government took over public security in municipalities, presumably absorbing some of the disbanded municipal police officers.

Narratives: state and municipal institutions

- **Baja California**, whose municipal police forces are evidently larger than its state security personnel (its state police force size ranged from 20 to 75 per 100K population, compared with 160-270 with municipales included), now appears as having among the largest aggregated police forces in the region. It showed no clear pattern across time.
- Recall that **Chihuahua's** state police force size had trended up after 2013, with its per-population rate between 50 and 100 depending on the measure. Adding municipales, its police forces ranged in size from 150 to 300. The broadest measure—all public security personnel (excluding admin) and ministerio personnel—trended up from 2012 to 2018, ending up as the largest combined force in the north (and higher than in the rest of the country), above Baja California.

- **Coahuila's** state police forces ranged in size from 20 to 90. With municipales, the range across all measures increased to 130-180. Whereas its state police was in the top half of the northern states, size wise, it ended 2018 with the smallest combined police force only above Tamaulipas. Across all measures and at both the state and municipal level, its police force rose from 2012 to 2016, then either plateaued or fell a bit by 2018.
- **Durango** was also in the top half of state police force sizes in the north, with its per capita size ranging from 30 to 100. With municipal police included, its combined police forces ranged in size from 120 to 230. It showed no clear pattern over time.
- **Sinaloa's** small state police personnel, ranging from 20 to 80, also contrasted with much larger municipal police forces, for a combined range of 120-240. It had no clear pattern.
- **Sonora's** state personnel was small and trending down in size (range 30-60). Its municipal police forces were the largest per capita in the north in 2012, though they, too, shrank across time. This left Sonora with largest combined police force in 2012 but gradual shrinking left its combined state and municipal forces at about the middle of the pack by 2018 across all measures.
- **Tamaulipas** started out with the lowest combined police force in the region and then disbanded its municipal police forces, shrinking combined police forces even further. Whereas its state police force was one of the top two highest by 2018, its combined state and municipal forces were significantly smaller than those of all other states.

Police size: spending per capita

In addition to operationalizing police capacity by counting cops on the street, we might also count pesos spent on public security. I again consider state and municipal spending on public security separately and then combined. State governments have reported this data annually since 2014. Because the numbers are volatile and sometimes missing, I assess overall spending per capita (in 2015 pesos) in this period in three ways: the state's average across the five years 2014-2018, its median spending level, and the average across all years except for any extraordinarily high or low levels. I also compare the first two years of spending (the 2014-2015 average) with the last two years (2017-2018).

Table E. State spending on public security per capita

State spending on public security per capita, 2014-2018				
ent_name	avg	median	avg minus outliers	% ch first vs last 2y
Baja California	115	90	90	70%
Chihuahua	202	206	219	31%
Coahuila	377	355	377	27%
Durango	322	303	322	32%
Nuevo Leon	678	656	636	15%
Sinaloa	198	279	303	-44%
Sonora	216	145	144	-54%
Tamaulipas	953	918	953	-5%
NORTH	412	395	412	2%
MEXICO CITY	1,881	1,914	1,952	-7%
REST OF COUNTRY	400	397	400	1%

In the top tier of spenders were **Tamaulipas** and **Nuevo León**, who spent 2–3 times as much per capita as the next largest spenders in northern Mexico (and were the only two above Rest of Country levels). Both already had strong spending levels in 2014 and did not increase or decrease that spending much over the period. In a second tier are **Coahuila** and **Durango**, who spent over 300 pesos per resident each year over the period and who increased this spending by about 30%. At the bottom are **Chihuahua**, **Sinaloa**, **Sonora**, and **Baja California**. These results are consistent with state personnel levels in public security ministries. Despite having smaller police forces, these eight northern states combined spent roughly as much per capita as did the rest of the country (excluding Mexico City). As we will see, this implies that northern states spend more on average per police officer than does the rest of the country.

Table E combines state and municipal government spending on public security. Data on municipal level spending per capita is available only for 2016 and 2018. I therefore provide combined state and municipal spending per capita on public security institutions for those two years. **Baja California**, **Chihuahua**, and **Nuevo León** made up the top tier, each spending over 1,000 pesos per resident (and above Rest of Country levels). **Sonora**, **Tamaulipas**, and **Coahuila**, who by 2018 had increased spending to close to 1,000, were in a second tier, while **Durango** and **Sinaloa** clearly lagged behind their neighbors and the rest of the country.

Table E. State spending on public security per capita

ent_name	State + municipal spending	
	2016	2018
Baja California	2,865	1,425
Chihuahua	1,227	1,021
Coahuila	695	833
Durango	622	556
Nuevo Leon	1,081	1,433
Sinaloa	601	643
Sonora	623	937
Tamaulipas	865	928
NORTH	1,154	1,043
MEXICO CITY	1,862	1,600
REST OF COUNTRY	1,035	733

Police quality: Spending per public security personnel

Measures of brute size and spending are one way of assessing security apparatus capacity. However, they do not account for the potential quality of the institutions or their personnel. A small, well-vetted, highly paid police force might be more effective than a large force that pays little and fails to vet its personnel. I provide three measures of police quality: spending per personnel, percentage of vetted personnel, and an indicator of institutional quality. I begin with total state spending on public security, which we have already analyzed, but now in terms of the spending per individual involved in such activities. Higher average spending per personnel might indicate higher wages offered and thus higher quality personnel, or better equipment and training per personnel. (Or it might indicate that spending is wasted or is that reported spending is exaggerated and includes expenses only marginally related to public security.)

At the state level, data on spending per personnel from 2014-2018 puts **Tamaulipas** clearly above its neighbors, alone in a first tier spending over 1 million pesos per public security employee on average. **Baja California, Coahuila, Durango, Nuevo León, Sinaloa, and Sonora** are not easily distinguished and are roughly on a second tier that spent around half of what **Tamaulipas** did. **Chihuahua** was clearly alone on a third tier, spending less per personnel than its neighbors (yet still more than the average across the rest of the country). **Sinaloa** and **Sonora** numbers were volatile and sometimes implausible; I do not place very much weight on their numbers. I note that their reported spending plunged by 50-80% from 2014-15 to 2017-18.)

Table F. State spending on public security per public security personnel

ent_name	State annual spending per personnel, 2014-2018 (thousands of 2015 pesos)			
	avg	median	avg minus outliers	% ch first vs last 2y
Baja California	590	460	457	69%
Chihuahua	341	350	366	21%
Coahuila	560	492	560	41%
Durango	664	580	664	46%
Nuevo Leon	583	576	583	14%
Sinaloa	572	340	923	-83%
Sonora	715	488	497	-51%
Tamaulipas	1,035	1,017	1,035	-36%
NORTH	615	612	615	-13%
MEXICO CITY	193	193	199	-5%
REST OF COUNTRY	309	309	309	4%

The picture again changes in some states when municipal spending and personnel are included. **Baja California** now jumps to the top alongside **Tamaulipas**, both spending upwards of 600,000 pesos per public security employee in 2018, suggesting that not only are municipal forces larger in that state, but also that municipal spending per personnel is higher than state spending. **Chihuahua**, **Coahuila**, and **Nuevo León** are in a second tier, spending above 300,000 in both years, while **Durango**, **Sinaloa**, and **Sonora** lagged behind their neighbors in one or both years.

Table G. State and municipal spending on public security per public security personnel

ent_name	State and municipal pu	
	2016	2018
Baja California	1,269	634
Chihuahua	436	385
Coahuila	390	477
Durango	348	294
Nuevo Leon	397	513
Sinaloa	246	258
Sonora	274	437
Tamaulipas	849	621
NORTH	514	463
MEXICO CITY	216	168
REST OF COUNTRY	355	260

If we focus on the average payroll per uniformed police officer (preventative police), the story is similar when including or excluding municipal police (Table H). **Baja California** and **Nuevo León** are again the top two spenders regardless of whether municipal police are included or not, **Tamaulipas** is clearly the laggard, and the rest of the states are clustered in between. Payroll in **Baja California** and **Sinaloa** trended down, whereas it trended up clearly in **Chihuahua** and **Nuevo León**. In the other states, there were no clear trends.

Table H. Average payroll per preventative police officer

ent_name	State preventative police salary per police						State and municipal preven			
	2012	2013	2014	2015	2016	2017	2012	2014	2016	2018
Baja California	365	352	261	223	214	202	208	181	190	176
Chihuahua	102	99	95	150	146	138	132	126	137	123
Coahuila	126	108	123	150	147	138	107	123	147	140
Durango	100	160	154	150	146	139	93	115	114	109
Nuevo Leon	162	173	164	171	203	210	158	166	182	172
Sinaloa	213	199	172	168	157	152	131	127	134	144
Sonora	138	139	165	165	160	151	112	114	120	121
Tamaulipas	74	86	87	85	83	78	87	87	83	78
NORTH	155	157	144	152	163	157	136	140	151	144
MEXICO CITY	173	163	173	151	147	138	173	173	147	138
REST OF COUNTRY	84	140	129	133	138	135	87	100	107	101

Police quality: Vetting

A 2009 law required federal, state, and municipal public security and criminal justice personnel to pass regular vetting procedures called "confidence control exams" (*controles de confianza*) to determine whether they were fit for duty. The exams, consisting of a polygraph test, a medical-toxicological examination, a psychological evaluation, and a background investigation, is supposed to be passed every two or three years for officers to maintain their certification—and job. The deadline for all institutions to operate with 100% screened personnel, after two extensions, was October 2014. Though these screenings have been criticized for their cost and opaqueness, and though their results are regularly ignored without consequence—only a fraction of officers who have failed these exams have been laid off—they are one proxy for the fitness of state personnel in charge of public security and of their governments' willingness and ability to carry out the screenings and implement their results. [Sources: Maureen Meyer for [WOLA 2014](#), Manuel Jorge Carreón Perea for [Nexos March 2021](#)]

Systematic data on vetting at the state and municipal level is in theory available through the same government censuses by the national statistics office that I have cited above. However, it is spotty. As Table I suggests, some states failed to report these numbers in some years, and others, like Durango, never once provided the data. Moreover, in most years it was unclear how many of the personnel were due to for (re-)certification; we only learned how many were evaluated or how many passed. I constructed a three-year rolling sum of vetted personnel and compared it with the current year's police force size. In other words, I added up how many personnel were vetted in the previous two years and the current year and expressed it as a percentage of the current year's total workforce. This is a generous and optimistic measure: it potentially double-counts officers who were certified twice over the three-year period (which was actually the initial rule for public security

personnel before it was relaxed to three years) and potentially counts officers who were vetted previously but no longer remained on the force. Still, it allows us to compare across states and provides a floor, 100%, below which we can be certain that police forces are not fully vetted.

State institutions

Data is available only for total public security personnel (2013-2018) or criminal justice personnel (2016-2018). Focusing first only on public security institutions, Table X shows, first, that Durango, Sinaloa, and Tamaulipas failed to provide data for most years (these rolling sums were calculated if at least two of the previous three years of data were available, so this is not an issue with a single year of unavailable data affecting several rolling sums). When they did, numbers were low: **Tamaulipas** never had a full police force worth of personnel vetted over a three year period, and **Sinaloa** only barely passed that minimal threshold for one type of institution in 2018. **Durango** provided no data at all, which I read as a sign that vetting was not carried out, that it was carried out on a very small portion of its personnel, or that its personnel were incapable of obtaining the information to report to Inegi, which all point toward a low-quality or low-confidence police force (I deem the possibility that Durango had excellent vetting numbers but chose not to report them to be unlikely.) **Baja California** and **Chihuahua** reported that three-year sums of vetted personnel represented majorities of their state public security forces, though they only passed the 100% threshold in three of the six years. **Coahuila** (starting in 2015), **Nuevo León**, and **Sonora** were most consistent. Note that Coahuila did not provide sufficient data for this measure until 2015, though when it did it was impressive; that Nuevo León began with solid numbers in 2013 but gradually slowed down its vetting over the following six years; and that Sonora's consistent percentages fluctuating close to 100% corresponded to one of the region's smallest state police forces. As a region, the northern states fared better than the rest of the country every year after 2013.

Table I. Vetted state personnel (3-year rolling sum) as % of current total

ent_name	Vetting: certified state personnel (3y rolling sum) as % of current total						Criminal justice		
	2013	2014	2015	2016	2017	2018	2016	2017	2018
Baja California	173%	167%	174%	79%	81%	85%	46%	51%	50%
Chihuahua	82%	73%	158%	157%	150%	77%	120%	124%	68%
Coahuila	---	---	243%	301%	307%	292%	216%	134%	49%
Durango	---	---	---	---	---	---	---	---	---
Nuevo Leon	196%	167%	136%	103%	96%	96%	161%	146%	177%
Sinaloa	---	---	---	---	85%	107%	33%	37%	30%
Sonora	101%	100%	114%	131%	95%	90%	---	---	---
Tamaulipas	---	79%	93%	---	---	---	48%	34%	41%
NORTH	74%	120%	194%	137%	120%	110%	92%	81%	63%
MEXICO CITY	98%	109%	43%	61%	55%	60%	115%	113%	71%
REST OF COUNTRY	84%	113%	97%	72%	73%	67%	36%	38%	35%

At state attorney general's offices, **Nuevo León** remained strong in all three years, while **Tamaulipas** continued to have little to be proud about. **Durango** continued to refuse to provide data and on this dimension was joined by **Sonora**. **Chihuahua** and **Coahuila** did well in 2016-2017 but seemed to stall in the three-year period through 2018. Baja California's three-year sums of certified personnel consistently represented about half of its total. **Sinaloa** did worse, at about a third (slightly below Rest-of-Country averages).

Municipal police

We have data on screening of municipal police for two years, 2014 and 2016. Without data for 2015, much less the years before or after 2014 and 2016, what we can learn is limited. For both years, I calculated the percentage of municipal public security personnel who passed the screenings as a percentage of those who were evaluated ("evaluated" columns) and as a percentage of the total ("total" columns). Table J presents averages across the two years. Among municipal public security personnel who were evaluated, the average passing rate across both years was highest in **Tamaulipas** and **Coahuila**, both higher than in the rest of the country (tier 1). **Baja California**, **Nuevo León**, **Chihuahua**, and **Durango** were lower but had at least a 2/3 passing rate (tier 2), while **Sinaloa** and **Sonora** lagged in the low 60% passing rate (tier 3). Of course, high passing rates may have been an artifice of low evaluation rates, with only relatively competent personnel evaluated by chance or by design. Fortunately, for 2016 we have data that directly addresses certification compliance no matter how many people were due to be certified that year: newly certified personnel as a percentage of personnel who were due to be (re-)certified ("obliged" column). Here, **Coahuila**, **Durango**, and **Sinaloa** top the list with compliance at three quarters or more, and above the national average, while **Chihuahua**, **Nuevo León**, **Baja California**, and **Sonora** were lower that year, with certification compliance below 60% and below the national average. **Tamaulipas's** compliance collapsed that year to almost zero.

Table J. Municipal personnel vetting

ent_name	Municipal personnel vetted as % of...		
	...evaluated	...obliged	...total
	2014 & 2016	2016	2014 & 2016
Baja California	75%	55%	16%
Chihuahua	70%	59%	35%
Coahuila	85%	85%	55%
Durango	66%	76%	22%
Nuevo Leon	73%	59%	37%
Sinaloa	60%	73%	19%
Sonora	62%	47%	18%
Tamaulipas	99%	2%	41%
NORTH	70%	61%	28%
MEXICO CITY	---	---	---
REST OF COUNTRY	76%	69%	32%

Of course, high passing rates do not alone translate into a high proportion of certified personnel, since the proportion of personnel evaluated might also had been small. Such was the case with **Baja California**, whose combined 75% passing rate translated into only 16% of its personnel certified in 2014 and 2016. Also with low average percentages of personnel certified in 2014 and 2016 were **Sonora**, **Sinaloa**, and **Durango**, all below the rest of the country's 32% average. **Coahuila**, **Tamaulipas**, **Nuevo León**, and **Chihuahua** were above that average, with **Coahuila** topping the others at 55%. Any of the four states doing badly along this dimension may have happened to be focusing its screening efforts on odd years, thus appearing unfairly weak on these even-year surveys of municipal governments. I therefore do not place much weight on this measure, though I do note that **Coahuila's** strong performance, **Sonora's** weak performance, and **Nuevo León's** and **Chihuahua's** middling performances on the other two measures were each confirmed by this column ("total").

Size and quality: vetted personnel per capita

Data on total police force size and the number of vetted personnel can be combined to count the size of *certified* or *high-quality* police forces. (This was not included in the dissertation summary tables or charts.) Table K below provides such a combination for state public security and criminal justice (investigator and prosecutor) personnel. Because data on confidence control exams is available only for total personnel, that is what I am able to provide; keep in mind that this includes administrative personnel, prosecutors and their legal staff, and others who might not be considered strictly police.

Table K. Vetted state personnel (3-year rolling sums) per 100,000 population

ent_name	Certified state personnel (3y rolling sum) per 100K pop								
	Public security						Criminal justice		
	2013	2014	2015	2016	2017	2018	2016	2017	2018
Baja California	35	33	33	16	16	16	42	46	46
Chihuahua	41	40	91	92	89	49	198	204	113
Coahuila	---	---	170	208	203	179	159	97	35
Durango	---	---	---	---	---	---	---	---	---
Nuevo Leon	178	195	156	119	109	115	122	104	118
Sinaloa	---	---	---	---	83	88	25	28	19
Sonora	33	31	33	38	27	27	---	---	---
Tamaulipas	---	65	77	---	---	---	37	28	37
NORTH	48	60	81	66	72	65	82	73	56
MEXICO CITY	988	1,079	421	600	541	584	190	194	121
REST OF COUNTRY	93	134	119	94	91	86	24	24	23

Recall that **Nuevo León** and **Tamaulipas** composed the top tier of police force size out of the eight northern states. However, in terms of *vetting*, Nuevo León remained strong, whereas Tamaulipas lagged and in several years failed to provide vetting data. Thus, Nuevo León remained at the top in terms of highly vetted police force size, whereas data for Tamaulipas was scarce in terms of public security institutions and weak in terms of criminal justice institutions. **Coahuila**, which had a police force that I considered second tier in the region and smaller than elsewhere in the country, had such strong vetting practices (as of the three years through 2015), that its cumulative vetted public security personnel was the largest in the region at least since 2015, and its certified criminal justice workforce was in the top half of the region (and well above Rest-of-Country national standards). Only **Chihuahua** appears as a state with police or prosecutorial forces that were, in relative terms, both large and highly vetted at least in the three years through 2015-2017, with vetting efforts appearing to have plunged in 2018.

Other states had either small vetted forces or unreliable information. **Baja California's** state police was always small, and its vetting performance, though above the national average, was not nearly enough to produce relatively large and well-vetted state forces. **Sinaloa** failed to report several years of data, and what it reported suggested at best that it was at about national standards by 2016 or 2017 through 2018. **Sonora** already had small state forces and apparently mediocre vetting practices, so failed to escape the bottom tier of northern states. Though **Tamaulipas** had a quickly growing state police force, its vetting practices were middling or unreported, leading to unimpressive vetted police numbers in the few years for which it was available. **Durango**, having failed to report any of its vetting results, had an unknown number of certified police and investigators.

Police quality: Institutional quality (Indepol)

The non-government organization Causa en Común is an organization and think tank working on security and justice issues with a focus on the rights of police officers and the quality of civilian police institutions. They have twice evaluated the rules, policies, procedures, and installations of state police institutions, comparing them with police development law stipulations, in what they call the Police Development Index ([Índice de Desarrollo Policial, Indepol](#)): once with data from 2015-2016 (Indepol 2017) and once with data from 2017 (Indepol 2018). The two main data inputs are official documents requested through information transparency platforms (equivalent to FOIA requests in USA), and data from the National Public Security System. Because these indices are an assessment of what is documented and shared, Causa en Común provides the following words of caution, which I translate and provide here in full:

"Because the main input to carry out this study are answers to information requests, it is important to emphasize that this exercise is also a transparency evaluation. In this sense, the willingness of these institutions to supply information affects the scores that they receive independently of their objective progress or shortcomings. This implies that some entities have achievements or progress that are not registered, since, for whatever reason, they were excluded from their answers. On the other hand, full compliance with information requests does not necessarily imply that an organization actually complies with the development objectives stipulated by law." (Indepol 2018, pg 4)

With these caveats in mind, Table L provides comparative data on Indepol scores.

Table L. State police institutional quality (Indepol)

	State police institutions	
	Indepol composite index	
ent_name	2015-2016	2017
Baja California	-22	-25
Chihuahua	-45	-36
Coahuila	-38	-40
Durango	-43	-46
Nuevo Leon	-37	-38
Sinaloa	-42	-54
Sonora	-55	-41
Tamaulipas	-38	-56
NATIONAL	-41	-38
NORTH	-40	-42
REST OF COUNTRY	-42	-36

Baja California and **Nuevo León** did well in both years, ranking highly compared with their northern state peers and with the national average. **Baja California** had the best grade of the eight states both years, and ranked above average on four out of five dimensions. In fact, it was the best-graded state police force in the country in 2015-16 and was in the top five in 2017, having slipped a bit in absolute terms (from -22 to -25). **Nuevo León** was the second-best ranked state among the eight northern states in 2015-2016 and third in 2017, holding about steady in absolute terms (-37, -38).

Coahuila, **Tamaulipas**, and **Chihuahua** performed inconsistently. **Tamaulipas** and **Coahuila** were at almost the same level as **Nuevo León** in 2015-16, better than the national average, but both slipped in 2017. **Coahuila** only lost two points in absolute terms, but it did so as the national average improved by three points, thus remained in the middle of the pack and now worse than the national average. **Tamaulipas** crashed from -38 to -56, becoming the second-worst graded police force in the country in 2017. Meanwhile, **Chihuahua** moved in the opposite direction, improving nine points from -45 (below the national average) to -36 (above average), though that still only put it in the middle of the mediocre pack.

Sinaloa, **Sonora**, and **Durango** showed consistently poor marks, below average in both years and, in the case of **Sinaloa** and **Durango**, worsening in absolute terms from 2015-16 to 2017 (while **Sonora** improved from -55, third-worst ranked, to -41, ranked 21/32). All three states were below the national average in one or both years on either four or all five dimensions.