

# Checkpoint 1

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## Theme:

Our theme is analyzing the influence that supervisors have on the officers they manage.

## Relational Analytics Questions:

- Which police units have average complaint\_percentiles above the 75th percentile?
- What commanders have complaint\_percentiles above the 75th percentile?
- What are the personal complaint percentiles for the commanders who oversee the units from Q1?
- How do unit sizes relate to complaint\_percentiles of units and their commanding officers?

## Answers:

- Which police units have average complaint\_percentiles above the 75th percentile?

	unit_id ↕	unit_name	↕ description	↕ avg ↕
1	173	311	Gang Enforcement – Area Central	80.10236565656566
2	183	393	Gang Enforcement Division	75.8969091397849462
3	197	549	Inspector General Detail Unit	90.7913
4	174	312	Gang Enforcement – Area South	84.2412693641618497

- We found that four units have an average complaint\_percentile above the 75th percentile. We found this by running a query to connect the data\_officerhistory to data\_policeunit, then connected units to data\_officer, and then averaged the percentile of each unit. We then showed only those above the 75th percentile. We were surprised to see that this is only 4 units. However, we do know from the Invisible Institute's findings that only a small number of officers are receiving the majority of complaints, and that these officers often times operate in groups. Knowing that, these findings make sense. Officers that commit misconduct are likely to collude with officers they are around, which would be officers within their unit. This would cause the officers within these units to have higher complaint\_percentiles and a higher complaint\_percentile for the unit overall.

- What commanders have complaint\_percentiles above the 75th percentile?
  - Our query for this question finds the supervisor of each unit and shows their personal complaint\_percentile if it is above 75. Because the number of units that have complaint\_percentiles above 75 was so small, we were surprised at the number of supervisors listed here. Especially surprising when we know that officers who commit misconduct usually act in groups. This causes us to ask questions about the units that the supervisors listed here oversee- do they have higher complaint percentiles than other units, just not above 75? Maybe their units' averages are clustered around a different threshold.

	officer_id ↕	unit_id ↕	unit_name ↕	complaint_percentile ↕
1	9970	132 167		97.9863
2	27797	160 214		98.4563
3	30710	3 002		81.6094
4	13303	27 026		93.8405
5	24996	156 211		88.8808
6	16617	21 020		93.7756
7	15592	179 353		95.3231
8	12478	188 441		99.5529
9	1932	16 015		83.5772
10	6792	19 018		90.2105
11	23543	31 045		82.1711
12	15368	13 012		92.4497
13	8026	26 025		78.7933
14	20913	9 008		94.9792
15	14684	225 701		88.1395
16	12628	151 191		75.2130
17	14630	6 005		98.2805
18	29882	107 142		94.1194
19	22393	128 163		81.4298
20	31984	193 542		90.1876
21	27274	204 606		87.1232
22	29225	208 610		84.7503
23	12479	212 620		97.8258
24	10170	10 009		88.3077
25	23492	174 312		94.2952
26	25319	5 004		81.7202
27	27415	36 051		97.3062
28	18434	142 177		78.0635
29	7471	215 630		85.3043
30	27392	40 057		86.8366
31	13273	173 311		95.8122

- What are the personal complaint percentiles for the commanders who oversee the units from Q1?

	officer_id ↕	unit_id ↕	unit_name ↕	complaint_percentile ↕
1	13273	173 311		95.8122
2	23492	174 312		94.2952
3	32391	183 393		43.0897

- To figure out who the supervisor is of each unit, we saw on Piazza to look at the highest salary of the unit. Our query looks up the salaries of each unit and finds

the highest. We then look at their complaint\_percentiles. We were very confused to only see 3 supervisors when there are 4 units. Upon further inspection, we discovered that there are only 3 results here because one of the units is inactive and therefore does not have a supervisor. Our hypothesis was that these units would have supervisors with high complaint\_percentiles. The supervisors with complaint\_percentiles at 95 and 94 are in line with what we were expecting. The supervisor in the 43rd percentile was unexpected.

- How do unit sizes relate to complaint\_percentiles?
  - We wanted to examine the context of the average unit complaint\_percentiles obtained in questions 1 and 3. A very small unit (of only one or two people) holds much less weight than a large unit with the same complaint percentile.
  - Our query obtained the commanders from each unit by finding the highest paid active officer per unit. In instances where there was more than one person with the top salary, we picked the first returned. We then compared those officers' complaint\_percentiles to the average of their police unit, as well as the total number of active officers in that unit. We also pulled the unit description, to give further context.
  - We found that 15 units had fewer than 10 officers in them (commanders included). The two largest units were called "Recruit Training Section", which contained 7,337 and 44,022 members, respectively -- these are catchall units that every officer is placed into, and should be ignored. The next largest unit was "District 011", at 3,813 officers -- other general district units followed. All the same, this is a dramatic range in unit sizes that should inform our analyses going forward. Any small units should be further examined to see if there are any noticeable trends, or if they should be excluded from future analysis.
  - For example, one of the smallest units also had one of the top average complaint\_percentiles -- the Freedom of Information Section unit had an average complaint percentile of 95.64, but also had a supervisor complaint\_percentile of 98.46, and is only comprised of two individuals. This means that there is not enough data to say if this unit has any predictable complaint behavior -- a large part of the average is determined by this one supervisor.

Smallest units:

	unit_id ↕	number_of_officers ↕	1 unit_name ↕	description ↕	supervisor_complaint_percentile ↕	avg_unit_complaint_percentile ↕
1	160	2	214	Freedom Of Information Section	98.4563	95.64595
2	144	2	179	Reproduction And Graphic Arts Section	34.5917	28.16475
3	115	2	148	Traffic Court Unit	26.8274	13.4137
4	96	3	135	Chicago Alternative Policing Strategy (Caps) Division	61.4497	70.82393333333333
5	157	3	212	Bureau Of Patrol - Area South	70.3068	65.3382
6	165	4	241	Troubled Building Unit	28.0005	44.097475
7	90	5	130	Technology And Records Group	16.2164	29.05584
8	164	5	231	Medical Section	21.2946	45.4274
9	87	5	128	Professional Counseling Division	31.5884	53.22836
10	128	6	163	Records Inquiry Section	81.4298	63.30098333333333
11	169	7	261	Court Section	63.5016	69.9897
12	192	7	541	Fop Detail	56.9371	40.4799428571428571
13	126	9	161	General Support Division	52.1914	43.7604888888888889
14	134	9	169	Police Documents Section	68.4116	48.2149444444444444
15	156	9	211	Bureau Of Patrol - Area Central	88.8808	70.9233
16	40	11	057	Detail Unit	86.8366	49.5437454545454545

Largest units:

	unit_id	number_of_officers	unit_name	description	supervisor_complaint_percentile	avg_unit_complaint_percentile
123	5	2952	004	District 004	81.7202	67.7813288617886179
124	10	2979	009	District 009	88.3077	65.43803383685006
125	16	3048	015	District 015	83.5772	59.4226904339250493
126	8	3160	007	District 007	61.9579	65.6404247148288973
127	7	3591	006	District 006	44.6372	67.1661594820384294
128	4	3753	003	District 003	60.4562	62.10333168
129	12	3813	011	District 011	42.1535	62.7455967741935484
130	30	7337	044	Recruit Training Section	70.6584	56.0801667406092872
131	30	44022	044	Recruit Training Section	0.0000	56.0801667406092872

- The larger units, in the 1000-4000 member range, were mostly district-specific general units (ex: "District 007") and had average complaint\_percentiles that only ranged from about 57-67. It makes sense that the percentile averages would trend towards the middle as we included more individuals. This suggests that perhaps we should re-evaluate how we determine "problematic" units and supervisors.
- Of note, of the 14 units with top complaint\_percentiles above 70, 11 of them were from the gang enforcement and narcotics units. These units had around 100-300 members. The other three all had fewer than 10 members. These gang enforcement and narcotics units' supervisors had complaint\_percentiles that seemed to vary pretty dramatically (from 43.95 - 99.23), but further analysis is necessary to see if there is any significant relationship.

	unit_id	number_of_officers	unit_name	description	supervisor_complaint_percentile	avg_unit_complaint_percentile
1	160	2	214	Freedom Of Information Section	98.4563	95.64595
2	174	276	312	Gang Enforcement - Area South	71.9384	85.2487195652173913
3	174	276	312	Gang Enforcement - Area South	94.2952	85.2487195652173913
4	153	246	193	Gang Investigation Division	99.2587	80.5053219512195122
5	153	369	193	Gang Investigation Division	43.9456	80.5053219512195122
6	173	294	311	Gang Enforcement - Area Central	95.8122	80.3775394557823129
7	183	188	393	Gang Enforcement Division	43.0897	76.6017574468085106
8	183	188	393	Gang Enforcement Division	82.9582	76.6017574468085106
9	175	116	313	Gang Enforcement - Area North	61.2052	75.7288922413793103
10	149	296	189	Narcotics Division	56.9371	70.947127027027027
11	149	296	189	Narcotics Division	62.7488	70.947127027027027
12	149	296	189	Narcotics Division	65.1141	70.947127027027027
13	156	9	211	Bureau Of Patrol - Area Central	88.8808	70.9233
14	96	3	135	Chicago Alternative Policing Strategy (Caps) Division	61.4497	70.82393333333333

- However, in general, it was difficult to see exactly what relationship existed between group sizes and complaint\_percentiles. We hope to remedy some of this in future work with visualizations.