Improving Police Performance in Rajasthan, India: Experimental Evidence on Incentives, Managerial Autonomy and Training

By Abhijit Banerjee and Raghabendra Chattopadhyay and Esther Duflo and Daniel Keniston and Nina Singh

Online Appendix

Table A1—Attrition in the Police Survey

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Attrition Rate</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>No transfer</td>
<td>0.348</td>
<td>[0.277, 0.418]</td>
</tr>
<tr>
<td>Duty rotation, weekly off</td>
<td>0.397</td>
<td>[0.315, 0.478]</td>
</tr>
<tr>
<td>Community observer</td>
<td>0.290</td>
<td>[0.202, 0.377]</td>
</tr>
<tr>
<td>All interventions</td>
<td>0.396</td>
<td>[0.326, 0.465]</td>
</tr>
<tr>
<td>Control</td>
<td>0.457</td>
<td>[0.382, 0.532]</td>
</tr>
<tr>
<td>Percentage staff trained</td>
<td>-0.0244</td>
<td>[-0.109, 0.0598]</td>
</tr>
</tbody>
</table>

Observations: 1556

95% confidence intervals in brackets
### Table A2—Program Effects on Crime

<table>
<thead>
<tr>
<th></th>
<th>(1) Endline only</th>
<th>(2) Endline only</th>
<th>(3) Station FE</th>
<th>(4) Station FE</th>
</tr>
</thead>
<tbody>
<tr>
<td>All interventions</td>
<td>0.00213</td>
<td>0.00336</td>
<td>0.00131</td>
<td>-0.00155</td>
</tr>
<tr>
<td></td>
<td>(0.00880)</td>
<td>(0.00825)</td>
<td>(0.0102)</td>
<td>(0.0105)</td>
</tr>
<tr>
<td>No transfer</td>
<td>0.0133</td>
<td>0.0118</td>
<td>0.00776</td>
<td>0.00721</td>
</tr>
<tr>
<td></td>
<td>(0.00849)</td>
<td>(0.00810)</td>
<td>(0.0119)</td>
<td>(0.0121)</td>
</tr>
<tr>
<td>Duty rotation, weekly off</td>
<td>0.0141</td>
<td>0.0131</td>
<td>0.0124</td>
<td>0.00840</td>
</tr>
<tr>
<td></td>
<td>(0.00980)</td>
<td>(0.00968)</td>
<td>(0.0127)</td>
<td>(0.0142)</td>
</tr>
<tr>
<td>Community observer</td>
<td>-0.00218</td>
<td>-0.00192</td>
<td>0.000459</td>
<td>-0.00151</td>
</tr>
<tr>
<td></td>
<td>(0.00924)</td>
<td>(0.00906)</td>
<td>(0.00945)</td>
<td>(0.0103)</td>
</tr>
<tr>
<td>Percentage staff trained</td>
<td>0.0105</td>
<td>0.00990</td>
<td>0.0156</td>
<td>0.0139</td>
</tr>
<tr>
<td></td>
<td>(0.00847)</td>
<td>(0.00855)</td>
<td>(0.0119)</td>
<td>(0.0127)</td>
</tr>
<tr>
<td>In study</td>
<td>-0.0124</td>
<td>-0.0119</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.00990)</td>
<td>(0.00975)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>15594</td>
<td>15550</td>
<td>22771</td>
<td>21900</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.021</td>
<td>0.028</td>
<td>0.001</td>
<td>0.008</td>
</tr>
<tr>
<td>District FE</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Station FE</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Victim characteristic controls</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Baseline/control mean</td>
<td>0.0824</td>
<td>0.0823</td>
<td>0.0776</td>
<td>0.0786</td>
</tr>
</tbody>
</table>

Standard errors in parentheses clustered by police station. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ All tables report results of the linear probability regression on an indicator variable equal to one if the respondent was a victim of a crime. Victim characteristics are as defined in the notes to Table 9.
<table>
<thead>
<tr>
<th></th>
<th>(1) Endline only</th>
<th>(2) Station FE</th>
</tr>
</thead>
<tbody>
<tr>
<td>All interventions</td>
<td>0.0205</td>
<td>0.0746</td>
</tr>
<tr>
<td></td>
<td>(0.0363)</td>
<td>(0.0759)</td>
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<tr>
<td>No transfer</td>
<td>0.0107</td>
<td>0.110</td>
</tr>
<tr>
<td></td>
<td>(0.0301)</td>
<td>(0.0736)</td>
</tr>
<tr>
<td>Duty rotation, weekly off</td>
<td>0.00924</td>
<td>0.0836</td>
</tr>
<tr>
<td></td>
<td>(0.0373)</td>
<td>(0.0837)</td>
</tr>
<tr>
<td>Community observer</td>
<td>-0.0503</td>
<td>0.0413</td>
</tr>
<tr>
<td></td>
<td>(0.0322)</td>
<td>(0.0915)</td>
</tr>
<tr>
<td>In study</td>
<td>0.0697</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0522)</td>
<td></td>
</tr>
<tr>
<td>Percentage staff trained</td>
<td>-0.0897</td>
<td>-0.0436</td>
</tr>
<tr>
<td></td>
<td>(0.0324)</td>
<td>(0.0450)</td>
</tr>
<tr>
<td>Prior decoy visits</td>
<td>-0.0104</td>
<td>-0.0133</td>
</tr>
<tr>
<td></td>
<td>(0.0123)</td>
<td>(0.0144)</td>
</tr>
<tr>
<td>Observations</td>
<td>1567</td>
<td>2062</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.252</td>
<td>0.245</td>
</tr>
<tr>
<td>District FE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Station FE</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Crime and victim controls</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Date of crime controls</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Baseline/control mean</td>
<td>0.271</td>
<td>0.277</td>
</tr>
</tbody>
</table>

Standard errors in parentheses clustered by police station. All columns report linear probability regressions on an indicator for whether the victim reported non-missing data on satisfaction with the police. Victim characteristics: age and gender of the respondent, education and dummies for the occupation of the head of household, indicators for caste or Muslim religion, and indicators for motorcycle ownership. Date of crime controls include dummies for month of crime.
Table A4—Decoy Intervention Effects on Victim Satisfaction

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>District FE</td>
<td>District FE</td>
<td>District FE</td>
<td>District FE</td>
</tr>
<tr>
<td>All interventions</td>
<td>-0.399</td>
<td>0.126</td>
<td>-0.307</td>
<td>0.444</td>
</tr>
<tr>
<td></td>
<td>(0.262)</td>
<td>(0.573)</td>
<td>(0.214)</td>
<td>(0.434)</td>
</tr>
<tr>
<td>No transfer</td>
<td>-0.458</td>
<td>0.0451</td>
<td>-0.532</td>
<td>0.149</td>
</tr>
<tr>
<td></td>
<td>(0.233)</td>
<td>(0.429)</td>
<td>(0.311)</td>
<td>(0.668)</td>
</tr>
<tr>
<td>Duty rotation, weekly off</td>
<td>0.217</td>
<td>-0.249</td>
<td>-1.022</td>
<td>-1.911</td>
</tr>
<tr>
<td></td>
<td>(0.207)</td>
<td>(0.464)</td>
<td>(0.693)</td>
<td>(0.989)</td>
</tr>
<tr>
<td>Community observer</td>
<td>0.192</td>
<td>0.179</td>
<td>0.192</td>
<td>0.226</td>
</tr>
<tr>
<td></td>
<td>(0.164)</td>
<td>(0.0983)</td>
<td>(0.0983)</td>
<td>(0.153)</td>
</tr>
<tr>
<td>Percentage staff trained</td>
<td>0.160</td>
<td>0.192</td>
<td>-1.201</td>
<td>-1.453</td>
</tr>
<tr>
<td></td>
<td>(0.103)</td>
<td>(0.164)</td>
<td>(0.590)</td>
<td>(1.002)</td>
</tr>
<tr>
<td>Observations</td>
<td>62</td>
<td>62</td>
<td>62</td>
<td>62</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.478</td>
<td>0.714</td>
<td>0.398</td>
<td>0.651</td>
</tr>
<tr>
<td>District FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Crime and victim controls</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Date of crime controls</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Baseline/control mean</td>
<td>0.214</td>
<td>0.214</td>
<td>0.214</td>
<td>0.214</td>
</tr>
</tbody>
</table>

Standard errors in parentheses clustered by police station. The outcome variable in all columns is an indicator equal to 1 if the crime victim reports being satisfied or very satisfied with the police handling of the case. Sample limited to males aged 20-60 who reported crimes of theft, burglary, or sexual harassment to the police themselves. Victim characteristics: age and gender of the respondent, education and dummies for the occupation of the head of household, indicators for caste or Muslim religion, and indicators for motorcycle ownership. All regressions include controls for the crime rate in 2005 and whether the station is urban or rural. Date of crime controls include dummies for month of crime.
<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Order of decoy visits</td>
<td>Order of decoy visits</td>
<td>Order of decoy visits</td>
<td>Order of decoy visits</td>
</tr>
<tr>
<td>Crime in 2005</td>
<td>-0.0120 (0.0108)</td>
<td>-0.0130 (0.0127)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of staff in 2006</td>
<td>-0.140 (0.161)</td>
<td>-0.101 (0.169)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>-0.624 (3.581)</td>
<td>-1.253 (3.652)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semi-urban</td>
<td>-0.367 (3.652)</td>
<td>-0.273 (3.516)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extremely polite on first visit</td>
<td>0.931 (2.776)</td>
<td></td>
<td></td>
<td>-0.142 (2.801)</td>
</tr>
<tr>
<td>Registered case on first visit</td>
<td>0.717 (2.098)</td>
<td></td>
<td></td>
<td>1.061 (2.078)</td>
</tr>
<tr>
<td>All interventions</td>
<td></td>
<td>-1.462 (3.107)</td>
<td>-1.647 (3.103)</td>
<td></td>
</tr>
<tr>
<td>Duty rotation, weekly off</td>
<td>-7.967 (3.372)</td>
<td>-7.958 (3.389)</td>
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</tr>
<tr>
<td>Community observer</td>
<td>-2.928 (3.039)</td>
<td>-2.743 (3.056)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No transfer</td>
<td></td>
<td>-1.934 (2.979)</td>
<td>-1.635 (2.978)</td>
<td></td>
</tr>
<tr>
<td>Percentage staff trained</td>
<td></td>
<td>-3.185 (2.770)</td>
<td>-2.108 (2.909)</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>788</td>
<td>788</td>
<td>788</td>
<td>788</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.666</td>
<td>0.665</td>
<td>0.667</td>
<td>0.667</td>
</tr>
<tr>
<td>District FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Month FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Standard errors in parentheses clustered by police station. The outcome variable is the order in which police stations were visited by decoy surveyors within each round of surprise visits to police stations by surveyors. All regressions include a control for the 5th round in which fewer stations were visited due to resource constraints.
### Table A6—Police Suspicions of Decoy Surveyors

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Case registered</td>
<td>Police were very polite</td>
<td>Police Suspected Decoy</td>
</tr>
<tr>
<td>Police Suspected Decoy</td>
<td>0.0856</td>
<td>0.0801</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.047)</td>
<td>(0.034)</td>
<td></td>
</tr>
<tr>
<td>Number of decoy visits</td>
<td>0.229</td>
<td>0.116</td>
<td>-0.00270</td>
</tr>
<tr>
<td></td>
<td>(0.088)</td>
<td>(0.051)</td>
<td>(0.075)</td>
</tr>
<tr>
<td>Surveyor’s decoy visits/10</td>
<td>0.0241</td>
<td>0.0143</td>
<td>-0.00239</td>
</tr>
<tr>
<td></td>
<td>(0.014)</td>
<td>(0.011)</td>
<td>(0.011)</td>
</tr>
<tr>
<td>Observations</td>
<td>788</td>
<td>788</td>
<td>788</td>
</tr>
<tr>
<td>( R^2 )</td>
<td>0.140</td>
<td>0.085</td>
<td>0.016</td>
</tr>
<tr>
<td>Station FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Month FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Mean with no suspicion</td>
<td>0.519</td>
<td>0.0943</td>
<td>0.193</td>
</tr>
</tbody>
</table>

Standard errors in parentheses clustered by police station. All columns report estimates of the linear probability model on the outcome of the surveyors’ visits to police stations to attempt to register a case. In column 1 the outcome is an indicator equal to 1 if the police were willing to register a case based on the surveyor’s complaint. In column 2 the outcome is equal to 1 if the surveyor perceived the police as very polite. In column 3 the outcome is equal to 1 if the surveyor thought police were somewhat or very suspicious that he was a decoy. All regressions include indicator variables for the crime story that the decoy surveyor attempted to report and the month of the intervention.
Table A7—Decoy Survey Geographic Spillovers

<table>
<thead>
<tr>
<th>Case registered</th>
<th>Police were very polite</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Percentage staff trained</td>
<td>0.0803 0.191</td>
</tr>
<tr>
<td>Recent decoy visits in 60 kms.</td>
<td>-0.0202 -0.0136</td>
</tr>
<tr>
<td>Recent decoy visits in district</td>
<td>0.00990 0.00329</td>
</tr>
<tr>
<td>Number of decoy visits</td>
<td>0.209 0.210</td>
</tr>
<tr>
<td>Observations</td>
<td>788 788</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.189 0.148</td>
</tr>
<tr>
<td>District FE</td>
<td>Yes No Yes No</td>
</tr>
<tr>
<td>Station FE</td>
<td>No Yes No Yes</td>
</tr>
<tr>
<td>Controls for police suspicions</td>
<td>Yes Yes Yes Yes</td>
</tr>
<tr>
<td>Control mean at first decoy visit</td>
<td>0.480 0.480</td>
</tr>
</tbody>
</table>

Standard errors in parentheses clustered by police station. All columns report estimates of the linear probability model on the outcome of the surveyors’ visits to police stations to attempt to register a case. In columns 1 and 2 the outcome is an indicator equal to 1 if the police were willing to register a case based on the surveyor’s complaint. In columns 3 and 4 the outcome is equal to 1 if the surveyor perceived the police as very polite. Recent decoy visits denote visits completed in the last 3 days, regardless of outcome. All regressions include controls for the month, the number of visits previously performed by the surveyor, the crime story used, and whether the surveyor thought police were somewhat or very suspicious that he was a decoy.
Table A8—Correlates of Implementation Performance

<table>
<thead>
<tr>
<th></th>
<th>(1) Community observer attendance</th>
<th>(2) Day off in last week</th>
<th>(3) Knows next duty</th>
<th>(4) Fraction staff transferred</th>
<th>(5) Fraction staff transferred</th>
</tr>
</thead>
<tbody>
<tr>
<td>District chief from state cadre</td>
<td>0.0932 (0.169)</td>
<td>0.159 (0.123)</td>
<td>-0.110 (0.171)</td>
<td>0.138 (0.0602)</td>
<td></td>
</tr>
<tr>
<td>Station chief has Inspector rank</td>
<td>-0.0188 (0.0373)</td>
<td>-0.0374 (0.0934)</td>
<td>-0.107 (0.104)</td>
<td>0.00271 (0.0498)</td>
<td>-0.0771 (0.0520)</td>
</tr>
<tr>
<td>Number of staff in 2006</td>
<td>0.00227 (0.00195)</td>
<td>0.00460 (0.00474)</td>
<td>0.000195 (0.00508)</td>
<td>0.00195 (0.00216)</td>
<td>0.00212 (0.00237)</td>
</tr>
<tr>
<td>Log police station area pop.</td>
<td>0.0168 (0.0323)</td>
<td>0.0141 (0.0576)</td>
<td>-0.00211 (0.110)</td>
<td>0.0154 (0.0250)</td>
<td>-0.0321 (0.0307)</td>
</tr>
<tr>
<td>Urban</td>
<td>-0.0674 (0.0417)</td>
<td>0.0313 (0.0899)</td>
<td>-0.0953 (0.0959)</td>
<td>-0.0560 (0.0432)</td>
<td>-0.0239 (0.0437)</td>
</tr>
<tr>
<td>Semi-Urban</td>
<td>0.0315 (0.0476)</td>
<td>-0.0865 (0.0812)</td>
<td>-0.203 (0.0965)</td>
<td>0.0416 (0.0310)</td>
<td>0.0290 (0.0377)</td>
</tr>
<tr>
<td>Crime in 2005 (100s)</td>
<td>-0.0621 (0.0164)</td>
<td>0.0111 (0.0293)</td>
<td>0.0562 (0.0387)</td>
<td>-0.00753 (0.0211)</td>
<td>0.0383 (0.0227)</td>
</tr>
<tr>
<td>Months elapsed between staff rosters</td>
<td>0.0261 (0.0138)</td>
<td></td>
<td></td>
<td>0.0261 (0.0138)</td>
<td>-0.0576 (0.0131)</td>
</tr>
</tbody>
</table>

Observations: 274 540 540 120 120

$R^2$: 0.112 0.085 0.096 0.558 0.268

District FE: Yes Yes Yes Yes No

Month FE: Yes Yes Yes No No

Mean of outcome: 0.0949 0.348 0.494 0.203 0.203

Standard errors in parentheses clustered by police station. Observations in each column are limited to the police stations in which the relevant interventions were supposed to have been implemented. The outcome in column 1 is based upon the reports of surveyors making surprise visits to police stations. Outcomes in columns 2 and 3 are based upon interviews with 2 constables during these random checks. Columns 4 and 5 are based upon comparisons of staff rosters before and after the project. In columns 4 and 5 we redefine the district police chief cadre variable to be the fraction of the period between the receipt of the initial and final staff rosters during which state-level police officers were leading the district.
Table A9—Program Effects on Fear of Police /labelFearTable

<table>
<thead>
<tr>
<th>intervention</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All interventions</td>
<td>0.0280</td>
<td>0.0464</td>
<td>0.196</td>
<td>0.0344</td>
<td>0.0710</td>
<td>0.188</td>
</tr>
<tr>
<td></td>
<td>(0.047)</td>
<td>(0.069)</td>
<td>(0.077)</td>
<td>(0.050)</td>
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<td>(0.050)</td>
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<td>(0.066)</td>
<td>(0.052)</td>
<td>(0.066)</td>
<td>(0.067)</td>
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<td>Duty rotation, weekly off</td>
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<td>0.0105</td>
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<td>0.0186</td>
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<td>(0.073)</td>
<td>(0.054)</td>
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<td>(0.056)</td>
<td>(0.070)</td>
<td>(0.067)</td>
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<td>Percentage staff trained</td>
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<td>0.0347</td>
<td>-0.0463</td>
<td>0.00445</td>
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<td>-0.0693</td>
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<td>(0.044)</td>
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<td>Baseline/control mean</td>
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Standard errors in parentheses clustered by police station.
Control variable details listed in notes of Table 6