The Role of “Big Data” in Improving Urban Quality of Life

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I Moved to Baltimore Yesterday!

My opportunity as the new director of the 21st Century Cities Initiative

• Learn new ideas from the excellent JHU faculty and students (supply)
• Finance and nurture this research to increase the supply of such “good ideas”
• Learn from local, state, national and international policy experts about what their priorities are and what policies might be politically feasible (demand)
• Act as a matchmaker and a facilitator to bring academic ideas “to the market”
• Promote two sided learning opportunities between academics, practitioners, and policymakers to bring research to practice
Our Approach

1. Incentives drive behavior

2. Distributional effects (winners and losers of policies) must be quantified

3. Budget priorities and confronting trade-offs

4. Rigorous hypothesis testing using Big Data
Five Examples of Our Current Work

• Neighborhood upward mobility in Baltimore and child lead exposure
• The causes and consequences of crime dynamics in Baltimore
• The causes and consequences of Air and water pollution dynamics in Baltimore
• Small business lending in Baltimore
• Public employee compensation in Baltimore benchmarked relative to NYC
Variation in Baltimore Neighborhood Upward Mobility


IRS tax data for children and parents from the same families are merged to quantify the effect of growing up in a specific neighborhood.
Correlates of Social and Economic Mobility

(Source: Maryland Department of Health and Philadelphia Department of Health)
Economic analysis is useful for understanding the causes and consequences of Neighborhood Level Crime Dynamics.

Baltimore City Homicides by Census Tract, January - July 2019
(Source: Baltimore Open Data)

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Our Green Cities Agenda

The most productive cities are beautiful. Boston, Seattle, San Francisco, Portland, and Chicago. Same patterns is found in China (Kahn and Zheng 2016)

Correlation versus causation?

The Human capital hypothesis

Indicators of Baltimore’s environmental health

Air pollution, water pollution, resilience on extremely hot days, litter
Small Business Growth and Access to Capital in Baltimore

A city with more economic opportunity faces fewer poverty challenges

Small business = key source of job growth

Small business needs access to capital


Mary Miller, 21CC Senior Fellow
Mac McComas, 21CC Associate Director
Transparency About Overtime Pay in the City of Baltimore

The Rise of Major Cities Sharing Open Data

Evidence from 2018 on the total pay (including overtime) of Baltimore and NYC Police.

Data Creation and Benchmarking Across Cities and The 21CC + JHU GovEx partnership

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<th>2018 Municipal Employee Earnings</th>
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<td><strong>City of Baltimore</strong></td>
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<td><strong>New York City</strong></td>
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<td><strong>All</strong></td>
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<td><strong>Employees</strong></td>
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<thead>
<tr>
<th>25%</th>
<th>48,371</th>
<th>55,607</th>
<th>46,737</th>
<th>58,398</th>
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<tr>
<td>50%</td>
<td>72,000</td>
<td>77,195</td>
<td>85,292</td>
<td>94,240</td>
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<tr>
<td>75%</td>
<td>94,198</td>
<td>103,400</td>
<td>89,371</td>
<td>126,500</td>
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<td>90%</td>
<td>112,133</td>
<td>126,518</td>
<td>109,360</td>
<td>150,651</td>
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<tr>
<td>99%</td>
<td>160,089</td>
<td>183,091</td>
<td>158,693</td>
<td>196,524</td>
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Employees: 13,683, 13,522, 3,005, 2,996, 337,505, 337,505, 55,529, 55,529.
The 21st Century Cities Initiative Revisited

The 21st Century Cities Initiative at Johns Hopkins University is the campus hub for research, education, engagement, and outreach related to expanding economic opportunity and improving quality of life for urbanites in developed and developing nations.

Prospective Data Collection

- Small Business Surveys on Locational Decisions and Services Needed
- Peer Learning Networks
- Hyperlocal Air Pollution and Heat Sensors
- Public Safety Interventions

Rhiannon Jerch, 21CC Post-Doctoral Researcher

Vrshank Ravi, 21CC Researcher

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