

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

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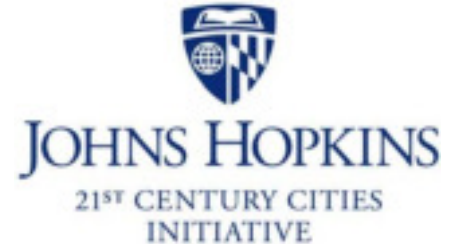
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# I Moved to Baltimore Yesterday!

## 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



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# 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



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# 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



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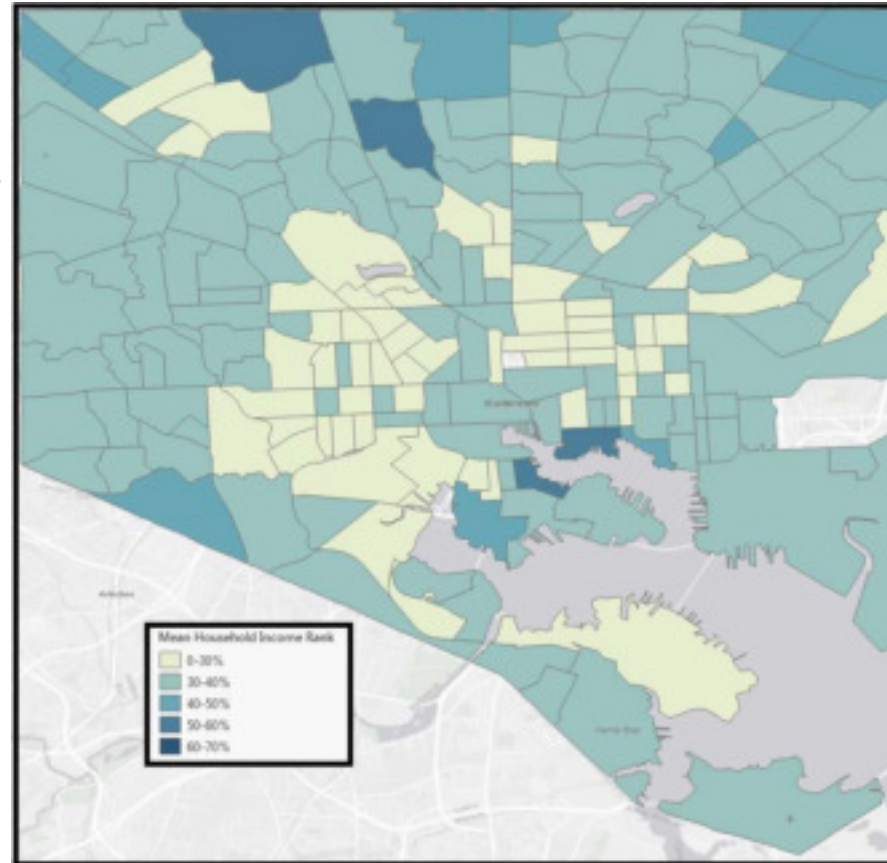
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# Variation in Baltimore Neighborhood Upward Mobility

**Darker Colors => greater upward income mobility for children who grew up in a specific census tract**

The Opportunity Insights Atlas data from Harvard.

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



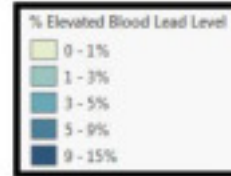
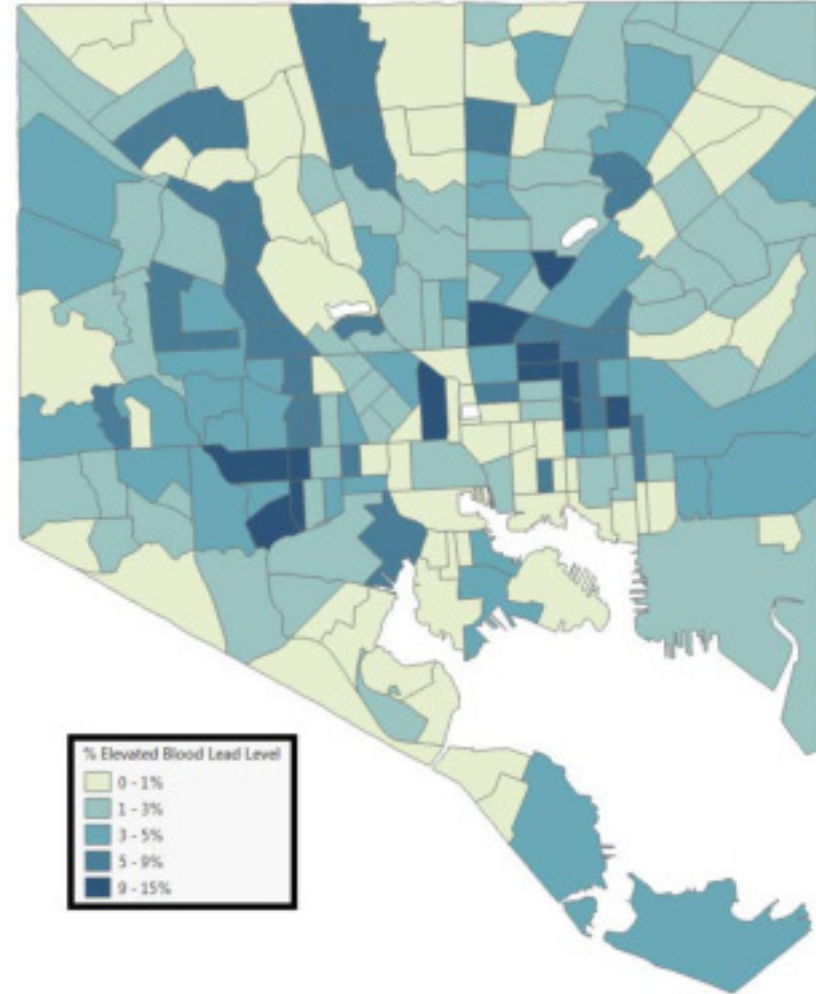
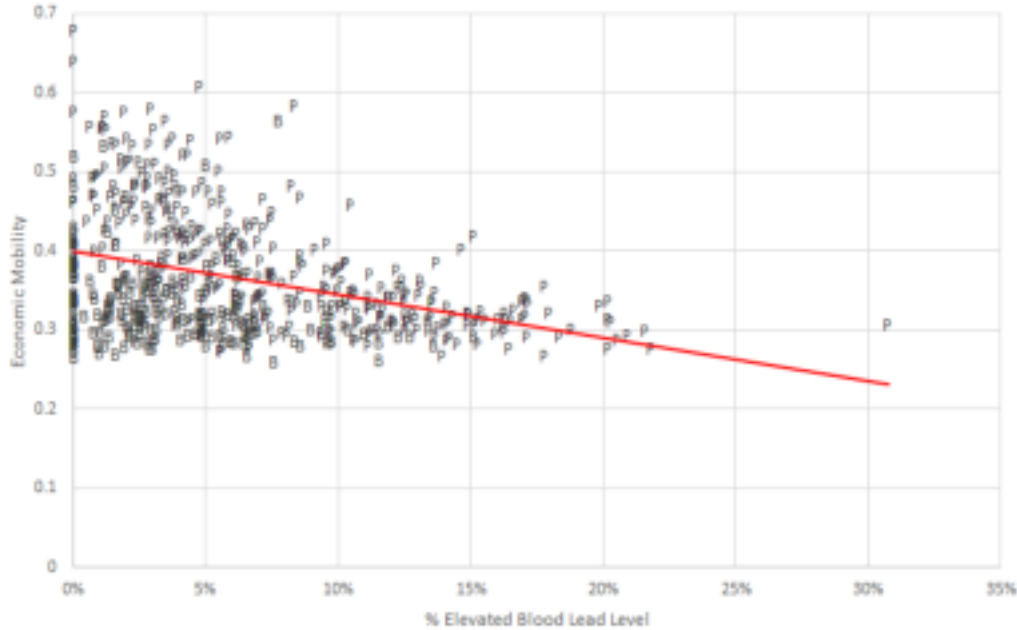
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# Correlates of Social and Economic Mobility

% of local Children with Elevated Blood Lead Levels

Lead and Economic Mobility in Baltimore and Philadelphia



(Source: Maryland Department of Health and Philadelphia Department of Health)

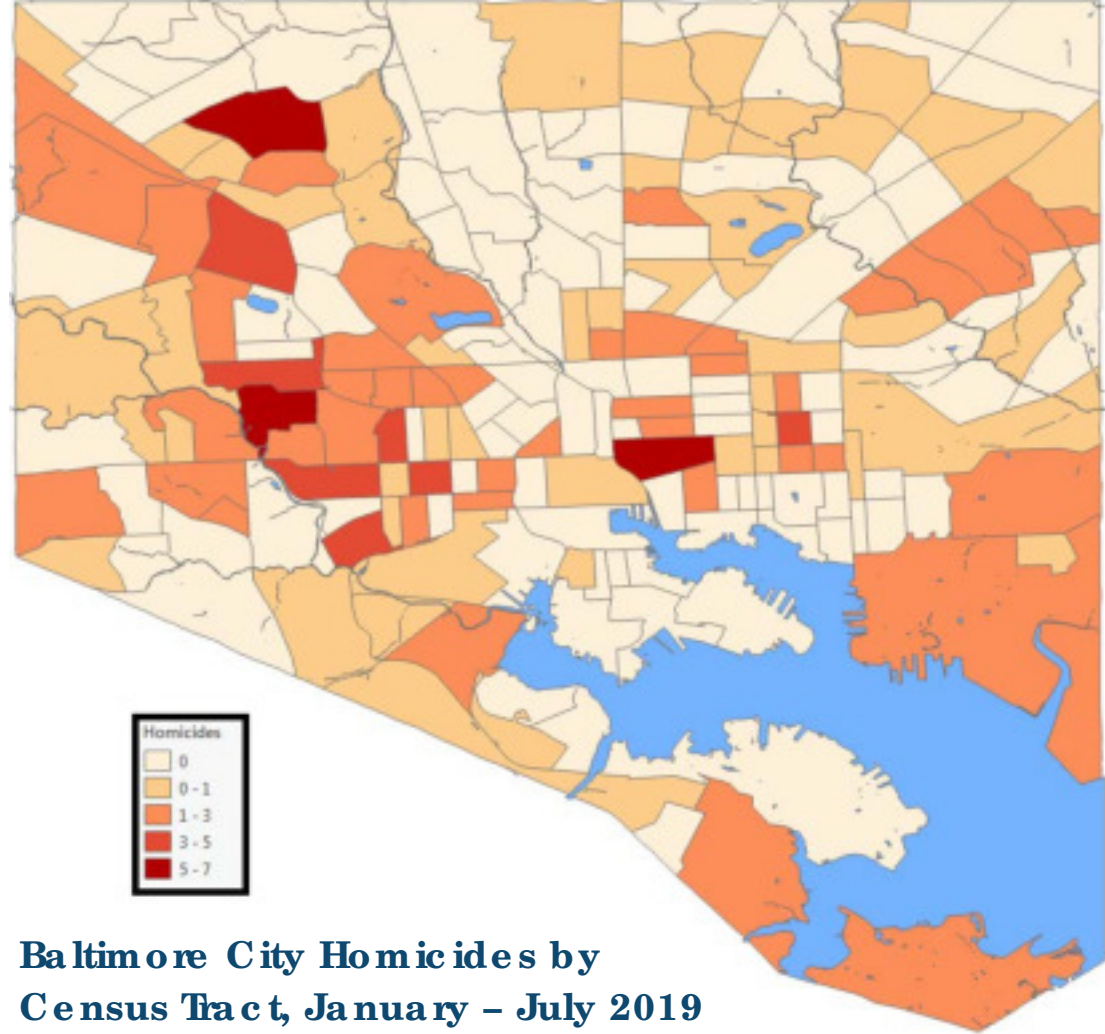
# Economic analysis is useful for understanding the causes and consequences of Neighborhood Level Crime Dynamics



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



# 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?

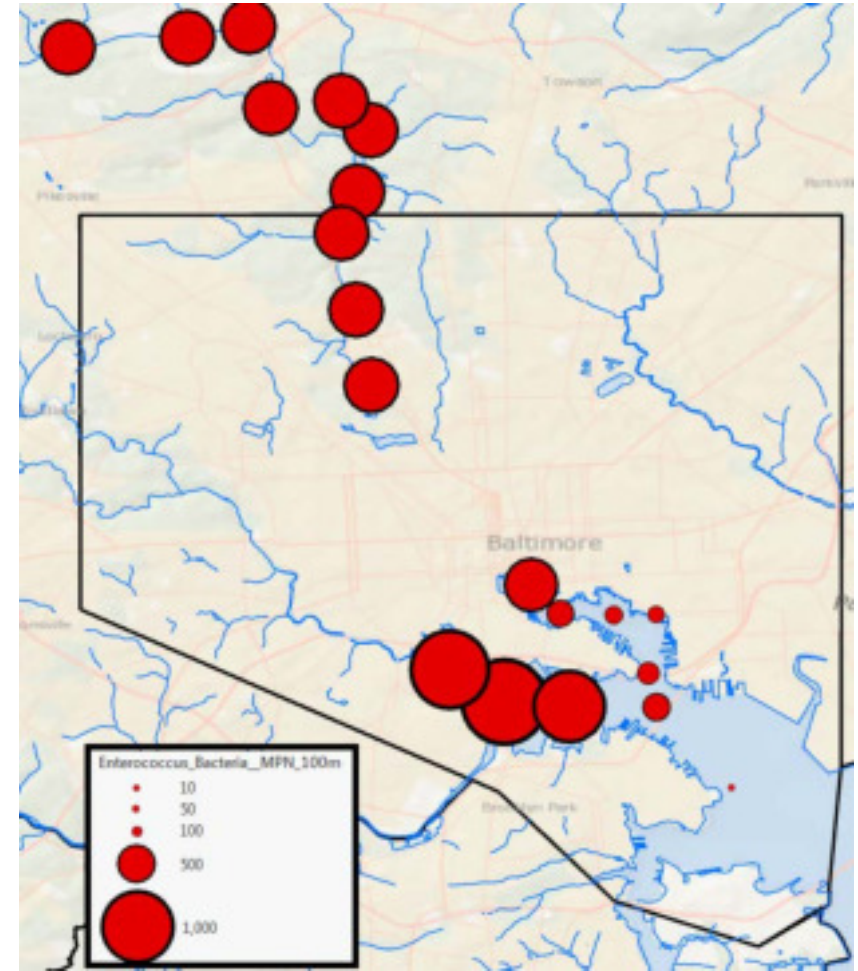
The Human capital hypothesis

Indicators of Baltimore's environmental health

Air pollution, water pollution, resilience on extremely hot days, litter

**Fecal Bacteria Levels, Nov. 6 and 7, 2018**

(Source: Blue Water Baltimore)





# Small Business Growth and Access to Capital in Baltimore

A city with more economic opportunity faces fewer poverty challenges

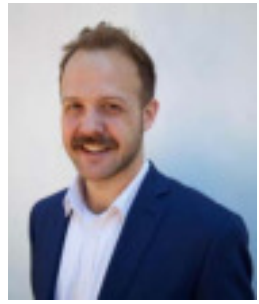
Small business = key source of job growth

Small business needs access to capital

Miller M, McComas M, Seigel B. [Financing Baltimore's Growth: Measuring Small Companies' Access to Capital](#). 2017.

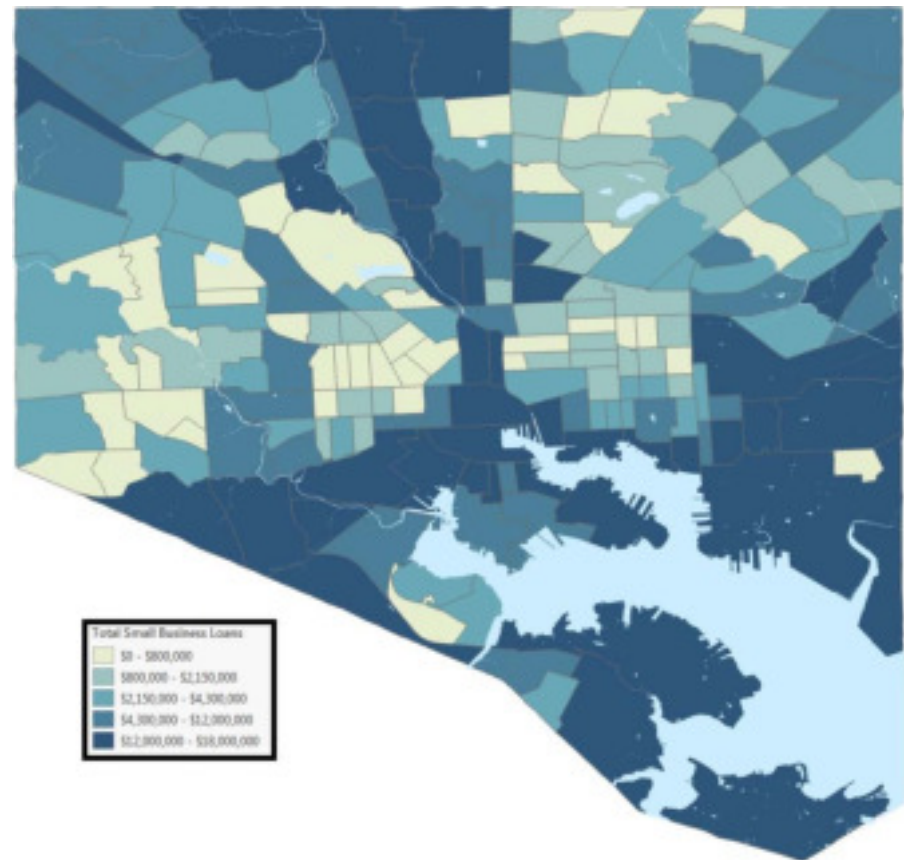


Mary Miller,  
21CC Senior Fellow



Mac McComas,  
21CC Associate Director

Total \$ Amount of Small Business Loans by FDIC Insured Banks by Baltimore City Census Tract, 2012-2017



Total Small Business Loans	
\$0 - \$800,000	
\$800,000 - \$2,150,000	
\$2,150,000 - \$4,300,000	
\$4,300,000 - \$12,900,000	
\$12,900,000 - \$38,000,000	

# 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

2018 Municipal Employee Earnings								
	City of Baltimore				New York City			
	All	All	Police	Police	All	All	Police	Police
	Base Pay	Total	Base Pay	Total	Base Pay	Total	Base Pay	Total
25%	\$ 36,399	\$ 37,506	\$ 60,732	\$ 65,956	\$ 48,371	\$ 55,607	\$ 46,737	\$ 58,398
50%	\$ 52,456	\$ 57,061	\$ 74,958	\$ 91,737	\$ 72,000	\$ 77,195	\$ 85,292	\$ 94,240
75%	\$ 73,440	\$ 81,733	\$ 84,959	\$ 115,699	\$ 94,198	\$ 103,400	\$ 89,371	\$ 126,500
90%	\$ 86,397	\$ 108,878	\$ 97,340	\$ 137,957	\$ 112,133	\$ 126,518	\$ 109,360	\$ 150,651
99%	\$ 129,114	\$ 161,246	\$ 126,378	\$ 188,972	\$ 160,089	\$ 183,091	\$ 158,693	\$ 196,524
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

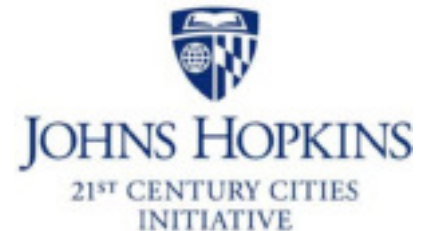
- Small Business Surveys on Locational Decisions and Services Needed
- Peer Learning Networks
- Hyperlocal Air Pollution and Heat Sensors
- Public Safety Interventions



Rhiannon Jerch,  
21CC Post-Doctoral Researcher



Vrshank Ravi,  
21CC Researcher



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