



Numerator-Denominator Aggregation Rules Used to Present Sub-County Environmental Health Data to the Public: Is it possible to maintain confidentiality and preserve spatial data trends?

Problem: No standard data suppression conventions exist for statistical reliability or confidentiality.

- Ex. *Healthy People 2010 criteria for data suppression*

Response: Evaluate different numerator-denominator aggregation rules to best present sub-county level health data in Maryland.

- Use spatial aggregation tools to combine geographies

Suicides



Data source: Maryland Violent Death Reporting System (MVDRS)

Data years: 2008 – 2011 (4)

Spatial unit: census tract

Injuries

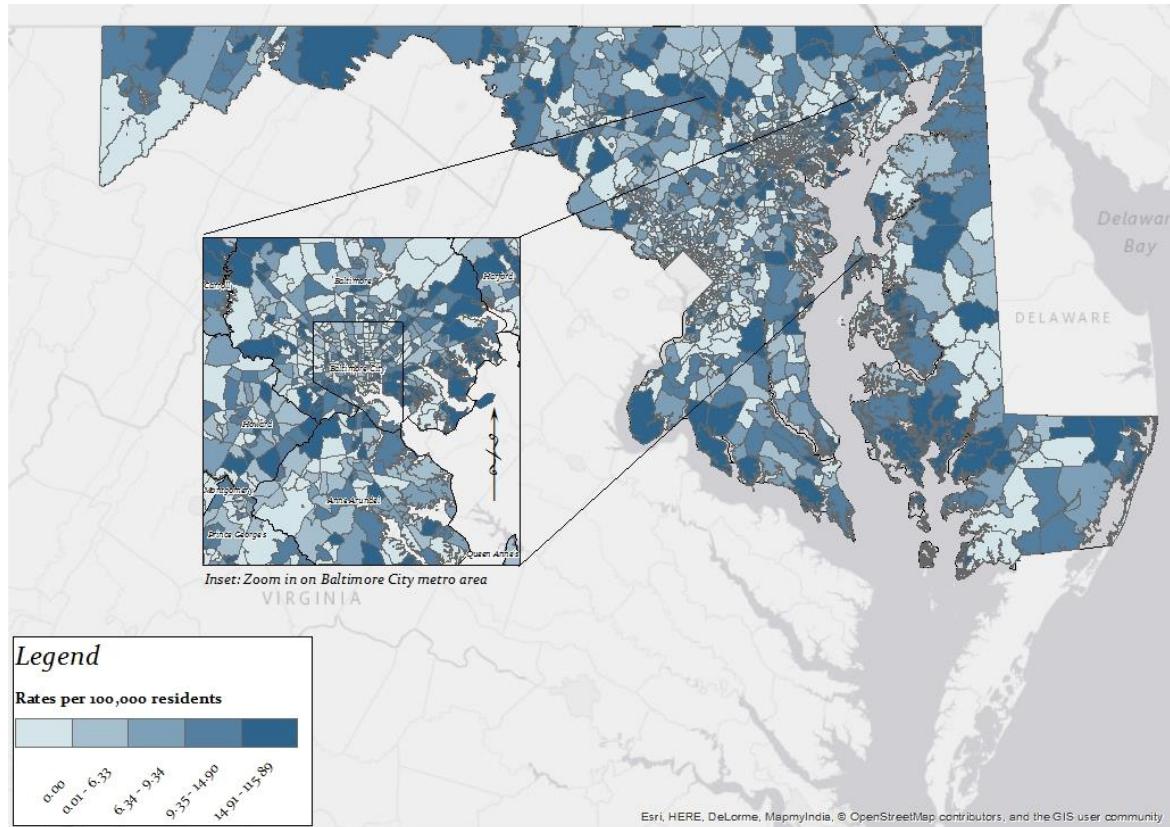


Data source: Maryland Health Services Cost Review Commission (HSCRC)

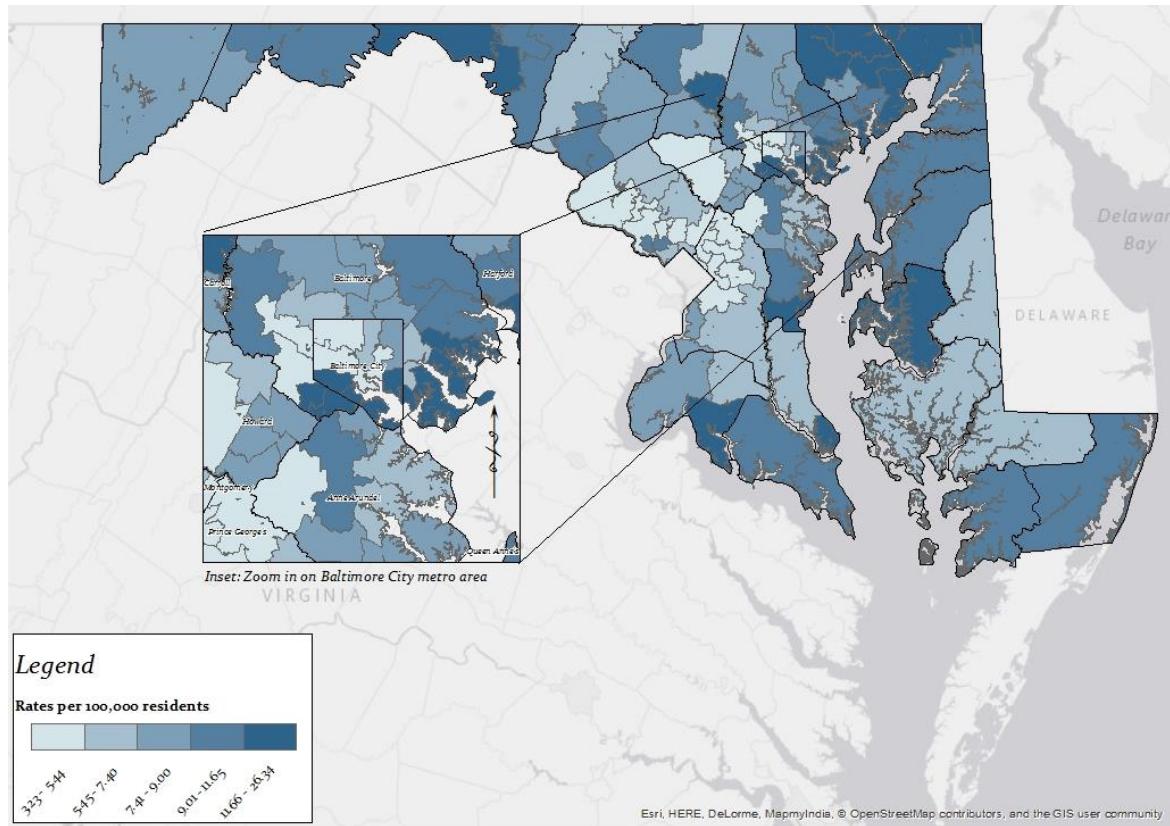
Data years: 2011 (1)

Spatial unit: zip code

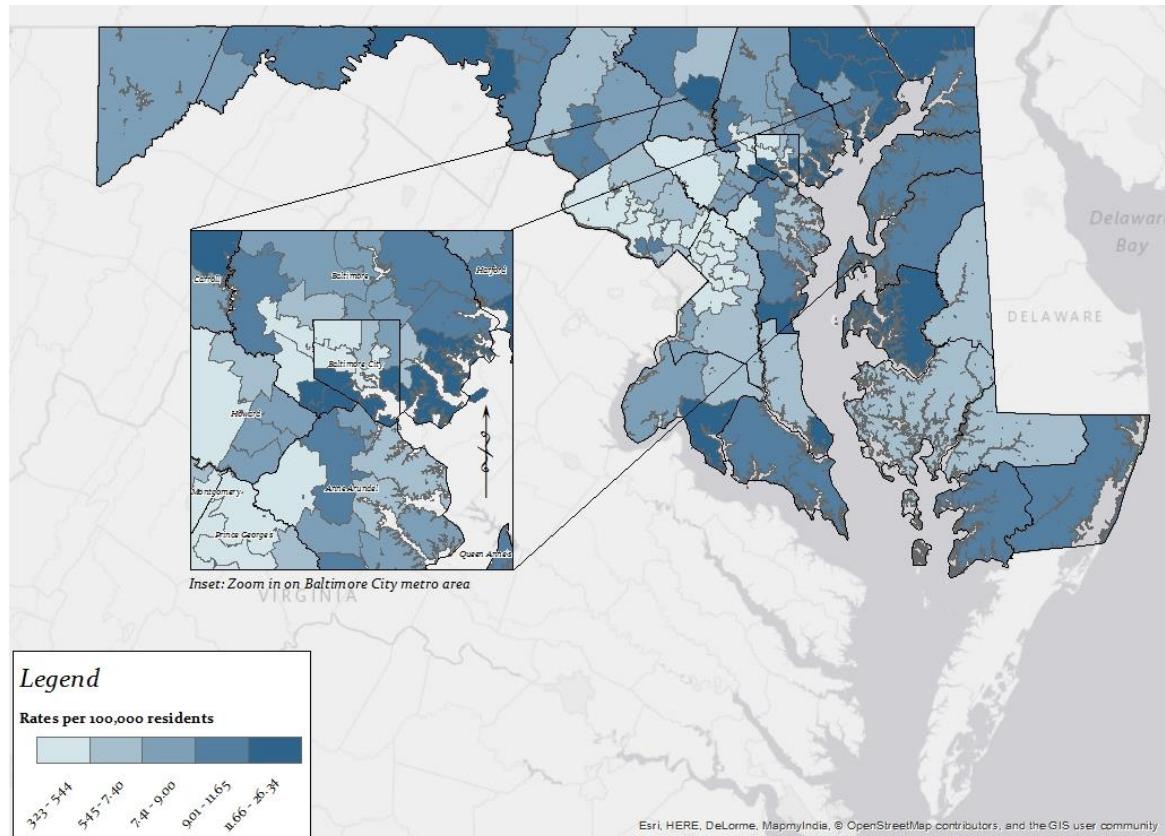
Suicide mortality rates (no aggregation)



12/1000



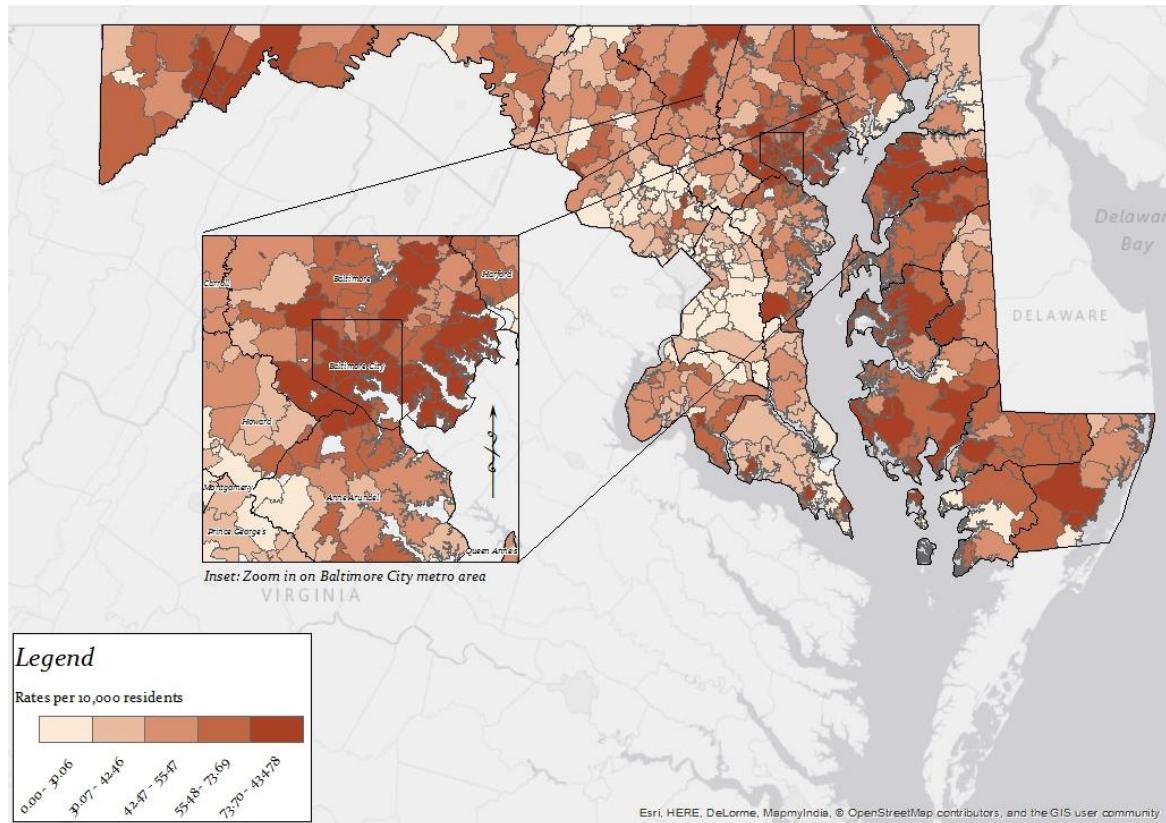
12/20,000



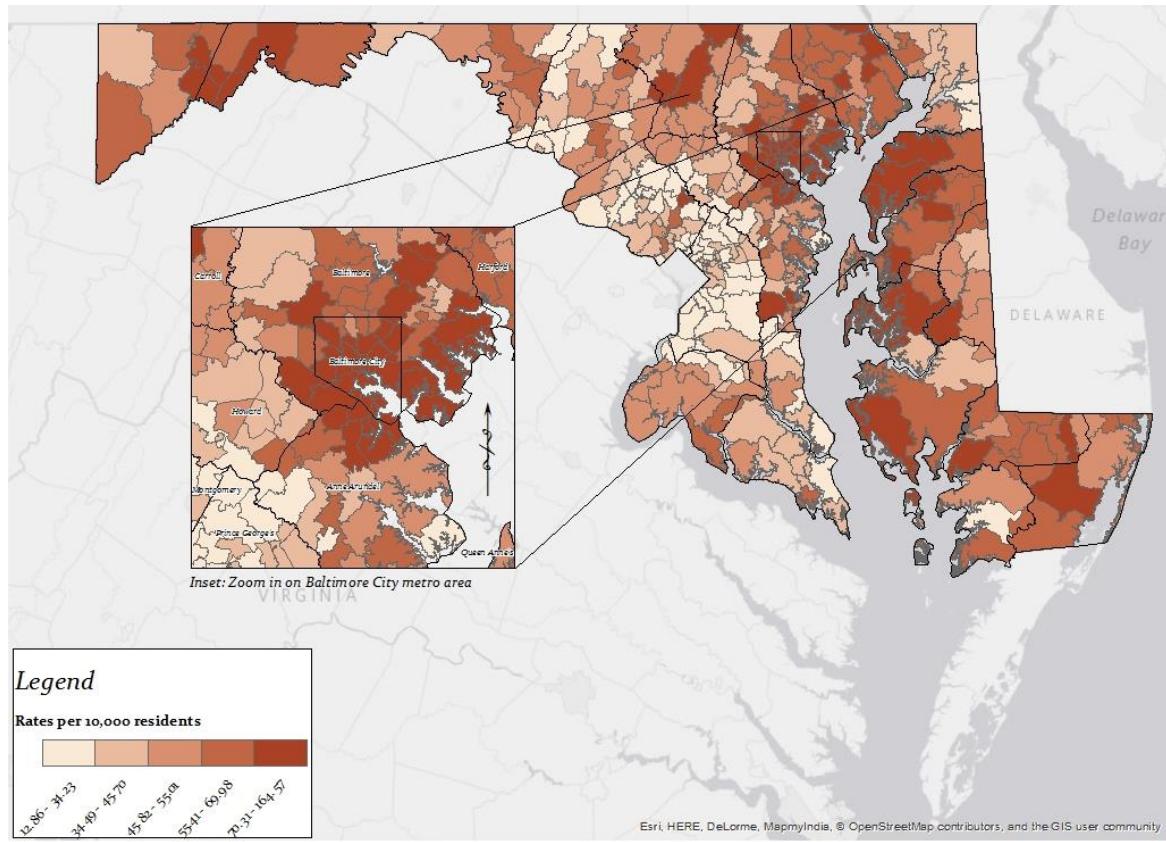
Summary of Aggregation Rules with Varying Thresholds

	No Aggregation	12/1000	12/20,000
# aggregated census tracts	N/A	90	90
% out of 1394 total census tracts	100	6.5	6.5
Numerator average	1	19	19
Numerator range	(0, 8)	(12, 38)	(12, 38)
Denominator (4 years) average	16,567	256,602	256,602
Denominator (4 years) range	(0, 63,736)	(49,352, 959,848)	(49,352, 959,848)
Suicide rate average (per 100,000)	7.7	8.7	8.7
Suicide rate range (per 100,000)	(0, 115.9)	(3.2, 26.3)	(3.2, 26.3)
# aggregated census tracts average	N/A	15	15
# aggregated census tracts range	N/A	(3, 60)	(3, 60)

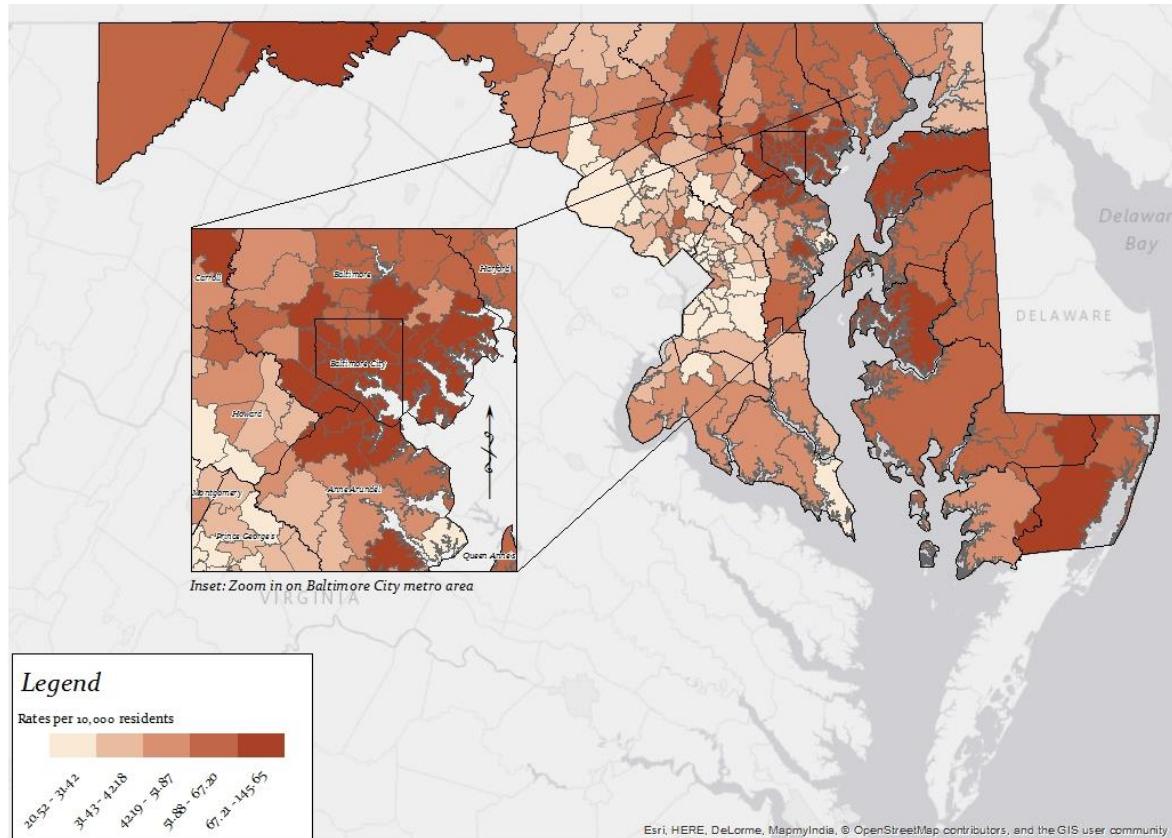
Hospitalization rates for all injuries (no aggregation)



12/1000



12/20,000



Summary of Aggregation Rules with Varying Thresholds

	No Aggregation	12/1000	12/20,000
# aggregated zip codes	N/A	306	153
% out of 443 total zip codes	100	69.1	34.5
Numerator average	72	100	200
Numerator range	(1, 667)	(12, 667)	(56, 708)
Denominator average	13,547	18,949	37,897
Denominator range	(0, 65,043)	(1303, 65,043)	(20,183, 84,494)
Injury rate average (per 10,000)	55.4	53.6	51.3
Injury rate range (per 10,000)	(0, 434.8)	(12.9, 164.6)	(20.5, 145.6)
# aggregated zip codes average	N/A	1.4	2.9
# aggregated zip codes range	N/A	(1, 9)	(1, 17)

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