

Lessons Learned from Needs Assessments on Rational Service Areas (RSAs) in New York

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Center for Health Workforce Studies

- **CHWS** — established in 1996 — is an academic research center based at the School of Public Health at the University at Albany, SUNY
- **Mission** — To provide timely, accurate information and conduct policy-relevant research about the health workforce
- **Goal** — To assist health, professional, and educational entities to understand the supply, demand, distribution, and the use of health professionals

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Rational Service Areas (RSAs)

- **RSAs are geographic areas that represent how and where the population residing within that area “reasonably” could or do seek certain health services.**

HRSA requires all states to conduct Health Professional Shortage Area (HPSA) designations based on RSAs for –

- **Primary Care**
- **Dental Health**
- **Mental Health**

Statewide RSA Plan is a new HPSA funding requirement

RSA Projects in NY

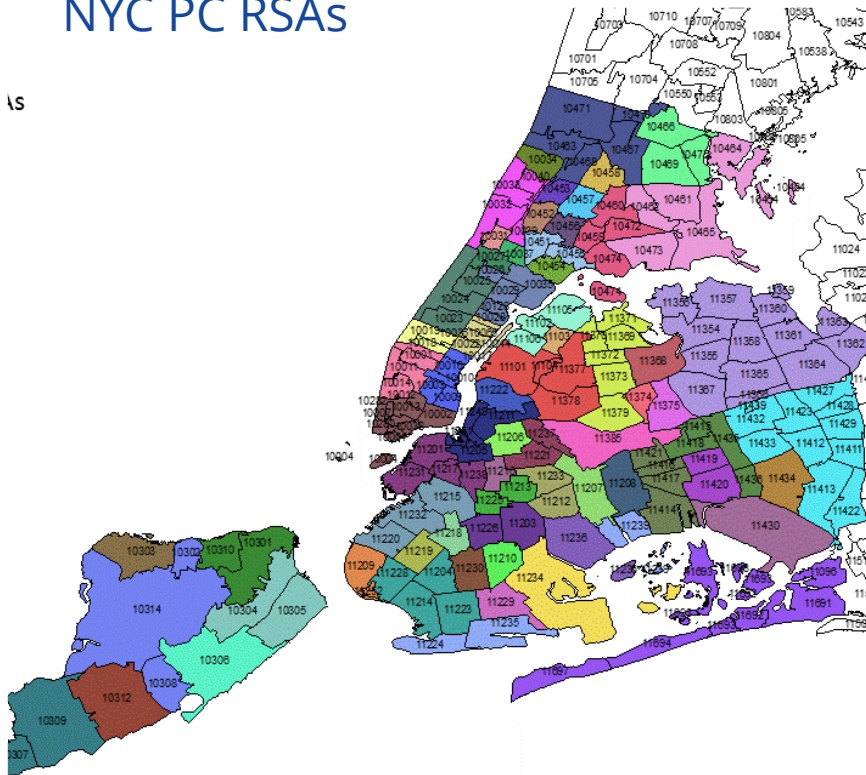
RSA development:

- **Medicaid Claims** – 4M+ underserved population
- **Patient Flow** – pairing claims by patient/provider zip codes
- **Commuting Patterns** – roads and speed limits

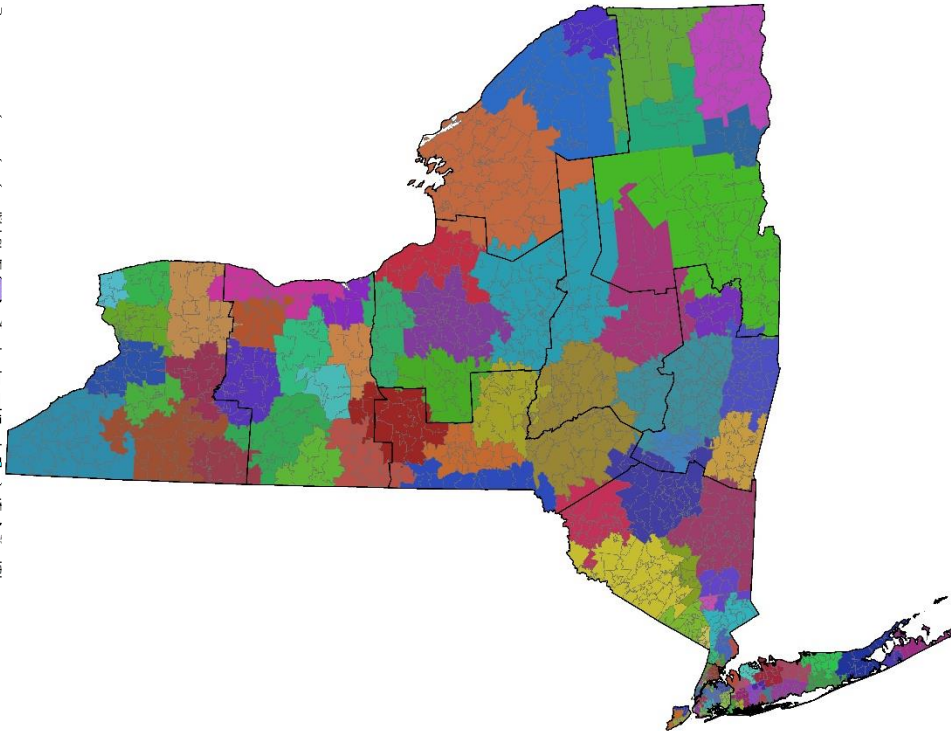
RSAs Project	# of RSAs	# of Claims	Data Source	Provider Type
Primary Care	277	6.3M	2013 Outpatient	PC Physicians
Dental Health	178	1.9M	2015 General dentistry	Dentists incl. Pediatric dentists
Mental Health	107	0.3M	2017 MH services w/ER	Physicians, NPs & PAs

Primary Care & Mental RSAs in NY

NYC PC RSAs



Mental Health RSAs



- RSA is an area with same color, consist of zip codes
- RSAs follow supply of providers & means of transportation

Next Step: RSA Needs Assessment

- Understand service utilization
- Identify RSAs with highest need
- Serve HPSA designations
- Inform policy makers/stakeholders about focus areas

RSAs Project	# of RSAs	Needs Assessment Method	# of Indicators
Primary Care	277	Rank each indicator & combine quartile score	5 Health Indicators + 5 Demographic
Dental Health	178	Composite Indicator (CI) ranking with revisit	8 Health + 3 Demo + 1 Geographical
Mental Health	107	Improved CI ranking	3 Health Indicators + 11 Demographic

Composite Indicator Method

CI illustrates a comprehensive view on health needs that cannot be captured by only individual variable as it is --

- A multidimensional measure
 - Integrates all relevant indicators into one ranking
- Methodologically feasible
 - Widely used among OECD, UN, European countries
 - Robust though somewhat subjective
- Easy to interpret
 - Acceptable for stakeholder and lay audience
 - Effective for developing data-driven narratives

CI Ranking Steps

1. Literature Review

2. Choosing Indicators

3. Data Preparation (RSA level)

4. Normalization & Aggregation

5. Ranking & Robust Analysis

Example: Dental RSA Indicators

Geographic indicator

- Population density – Pop. / mi²

Demographic Indicators

- Percent of racial/ethnic minorities
- Percent of people not speaking English at home
- Percent of people enrolled in Medicaid

Dental Health Indicators

- Medicaid dental ED visits rate
- Medicaid dental visits rate to primary care services
- Dental providers per 10,000 Medicaid enrollees
- Dental provider Medicaid acceptance rate
- Percent of low birth weight
- Percent of pre-term birth
- Mental providers per 10,000 Medicaid enrollees
- Medicaid mental ED visits rate

Example: Dental RSA CI Ranking

- By mix-matching two normalization (Z score & Min-Max) and two weighing methods (Equal and PCA), median of four rankings were used to rank 178 dental RSAs
- RSAs in the 1st quartile are of high need

Top 10 High Need Dental Health RSAs in New York

RSA#	R1: EW-Z	R2: EW-MM	R3: PCA-Z	R4: PCA-MM	Final Rank	NY Region	R/U
4	177	178	177	178	1	Mid Hudson	Rural
96	178	177	178	177	1	Capital Region	Urban
178	176	176	176	175	3	Finger Lakes	Urban
176	175	174	175	174	4	Finger Lakes	Rural
98	174	173	174	172	5	Capital Region	Urban
114	167	175	172	176	5	North Country	Rural
103	173	172	173	173	7	Capital Region	Rural
25	171	171	171	164	8	New York City	Rural
104	169	169	168	169	9	Capital Region	Rural
60	172	167	170	160	10	New York City	Urban
92	164	170	167	170	10	Mohawk Valley	Rural

Lessons Learned

1. Comprehensive literature reviews (LRs) are important.

- What have been done?
- How to identify needs? – primary care, dental, mental
- Multi-dimensional aspects – socioeconomic, patient, provider
- Set your boundaries – your goal/focus/timeline?

2. Indicator selection is crucial.

- Rationalize your selection – LRs, norm, regulation?
- Data availability – time, money, human capital, zip code level?

Dental Health Indicators

Percent of low birth weight

Percent of pre-term birth

Mental providers per 10,000 Medicaid enrollees

Medicaid mental ED visits rate

Lessons Learned (cont'd)

3. Test Indicators on correlation & compensability issue.

- 2+ indicators measure the same dimension of need
 - % single female headed vs % household below 200% FPL
- a surplus in one dimension can offset a deficit in another
 - % covered by private insurance vs % Medicaid coverage

4. The construction of CI involves stages where subjective judgement has to be made.

- the selection of indicators
- the treatment of missing values,
- the choice of aggregation model,
- the weights of the indicators, etc.

Lessons Learned (cont'd)

5. Weighting should be minimized to maximize objectivity.

- Use equal weighting
- Principle components analysis (PCA) / factor analysis
 - Assign statistical weights
 - summarize a set of indicators while preserving the maximum possible proportion of the total variation in the original data set

6. Scientific data preparation is required.

- Outlier detection and handling
 - 0s on indicator(s) (e.g. Dental ER Visits) for less populated RSAs
- Skewness of data
 - Square root, cube root, or logarithm (e.g. Population Density)
- Data transformation
 - Normalization methods - Min-max, Z-score

Lessons Learned (cont'd)

- Rank after aggregating normalized indicators is more unbiased, compared to rank each indicator beforehand.**
 - Mental/Dental RSA ranking – four normalized ranks
 - PC RSA ranking – ~~rank each indicator first, then combine~~
- Sensitivity analysis is necessary to test the shifts in ranking to ensure robustness.**

RSA#	1. EW_Z-score	2. EW_MM	3. PCA_Z-score	4. PCA_MM	AbtDiff	High Need Rank
25	1	1	1	1	0	1
8	4	2	2	2	2	2
32	5	3	3	3	2	3
60	3	4	4	4	1	4
96	2	5	5	5	3	5
18	6	6	6	6	0	6
26	8	7	7	7	1	7
21	9	8	9	8	1	8
61	7	9	8	9	2	8
65	10	10	10	11	1	10

Lessons Learned (cont'd)

- 9. To understand and interpret the needs correctly, CI de-constructing could be useful.**
 - looking back at separate health indicator can help to extend the assessment to facilitate interpretation

- 10. While three RSA projects share similar demographic indicators, the differences and uniqueness in selected health indicators should be emphasized by researchers when comparing RSAs.**

- 11. RSA needs assessment should be revisited and updated when significant health care environmental changes happen.**
 - Population in-migration/out-migration
 - ACA, Medicaid expansion
 - HRSA HPSA new requirement

Implications

- A robust needs assessment on RSAs would serve as a solid foundation for HPSA designations.
- The evolving CI ranking methods on RSAs offer a comprehensive way to analyze health needs and access to care issues in New York.
- Future RSA needs assessments will be conducted according to the updated knowledge base.
- Understanding the challenges of conducting needs assessment on RSAs may facilitate future collaborations between state and local health agencies, communities and academic partners.

Questions?

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