

Developing Rational Service Areas for Needs Assessments: Network Analysis of Medicaid Data in New York State

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ABSTRACT

Purpose: This research developed primary care rational service areas (RSAs) based on Medicaid patient commuting patterns and identified those RSAs with the highest health care needs.

Background: Federal shortage area designation guidelines include the development of RSAs. In an effort to better characterize the needs of the population of New Yorkers, RSAs were developed based on where Medicaid patients receive primary care services. The premise for this research is that Medicaid patients may travel further for primary care because not all primary care providers accept Medicaid.

Methods: New York State Medicaid claims data for primary care services was used to create RSAs. UCINET software was used to analyze the relationship between zip codes of patients and zip codes of providers. Using plurality of where patients went for care, zip codes were combined into RSAs. The analysis initially yielded 279 RSAs. Initial RSAs were adjusted to align with current shortage area guidelines, by making them no larger than a county, avoiding non-contiguous zip codes which created RSAs, and eliminating donut holes within RSAs. Health care needs of RSAs were measured using 5 demographic indicators and 5 health status indicators. Needs scores were generated by ranking RSAs on the data elements.

Results: 277 RSAs were identified. Rural RSAs were larger and tended to be composed of more zip codes. High health care need was found in both urban and rural RSAs.

Conclusions: RSAs with high needs were located in both urban and rural areas, demonstrating the importance of community characteristics in identifying need.

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INTRODUCTION

Under contract with the New York State Department of Health (NYSDOH) and as part of a cooperative agreement with NYSDOH and the Health Resources and Services Administration, the Center for Health Workforce Studies (CHWS) developed Medicaid-based RSAs. While New York State has an abundance of primary care providers, there continues to be access issues for vulnerable populations. Additionally, fewer primary care providers accept Medicaid; thus, Medicaid patients may travel further to access primary care services. The current methods for defining RSAs may not adequately capture the commuting patterns of Medicaid patients or their issues accessing care.

Identifying need within RSAs may also be difficult. Social determinants of health as well as the health care infrastructure, such as where providers are located, have an impact on access to care and ultimately health care outcomes. Creating deprivation scores based on multiple data elements may be a more useful method for identifying need within RSAs.

METHODS

Data used:

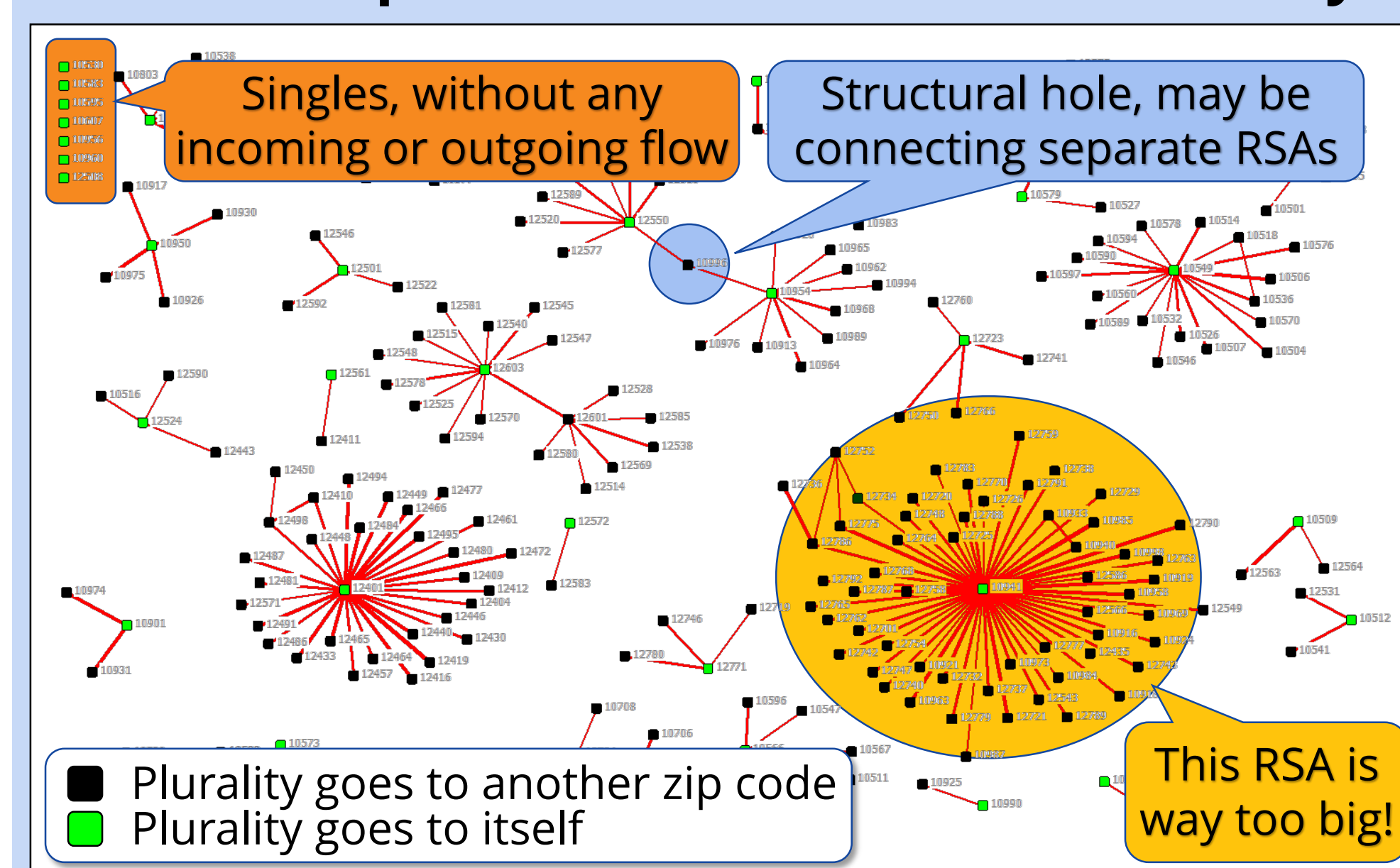
- 2013 New York State Medicaid claims
- Linked Patient zip code and Provider zip code
- Assessed evaluation and management CPT codes in primary care settings
- Data cleaned/filtered
- Total final records: 6,332,131

Zip codes related with matrices

- 1,579 Provider × 1,579 Patient zip codes
- Weighted by number of patients
- Simplified into a plurality matrix (1s and 0s)
- Patient zips clustered with UCINET 6

UCINET identified initial relationships between zip codes.

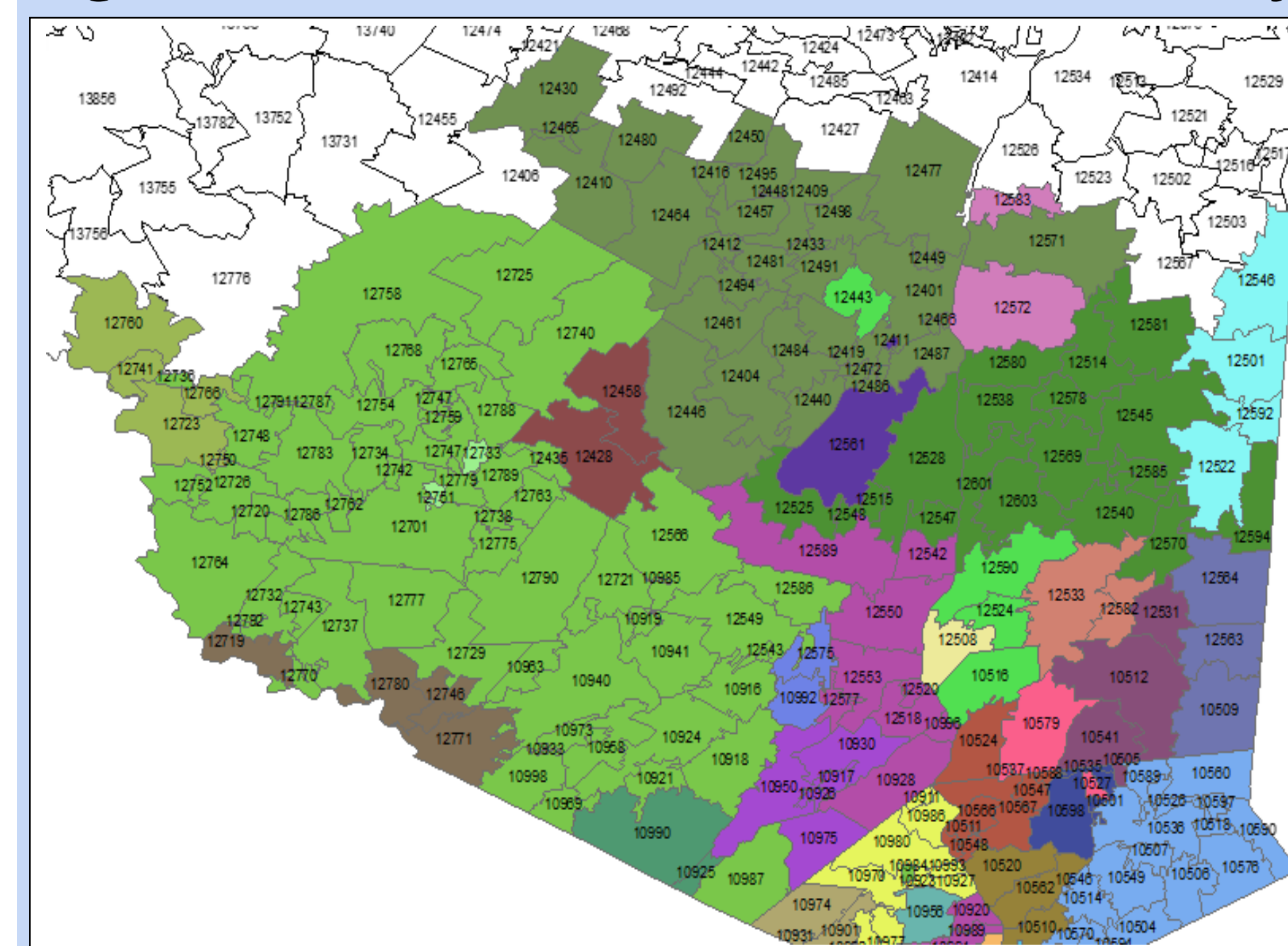
Figure 1: Linkages Between Patient and Provider Zip Codes for Lower Hudson Valley



METHODS (cont.)

Based on the linkages between patients and providers, RSAs were created.

Figure 2. Initial RSAs for Lower Hudson Valley



The initial RSAs that were developed did not follow current shortage area designation guidelines.

- They were larger than a county
- Non-contiguous zip codes created RSAs
- RSAs had holes within them

RSAs needed to be refined to eliminate these issues.

After the RSAs were finalized, data elements were identified that could identify need.

Demographics:

- Percent of population that is:
 - Enrolled in Medicaid
 - Below 200% federal poverty level (FPL)
 - Ages 65 and older
 - Racial/ethnic minorities
 - Speaking language other than English in the home

Health Status:

- Rate of avoidable hospitalizations
- Rate of avoidable ED visits
- Population to primary care physician ratio
- Overall mortality rate
- Percent of low birthweight births

Values identified for each zip code for each element and aggregated to the RSA level. RSAs ranked and split into quartiles.

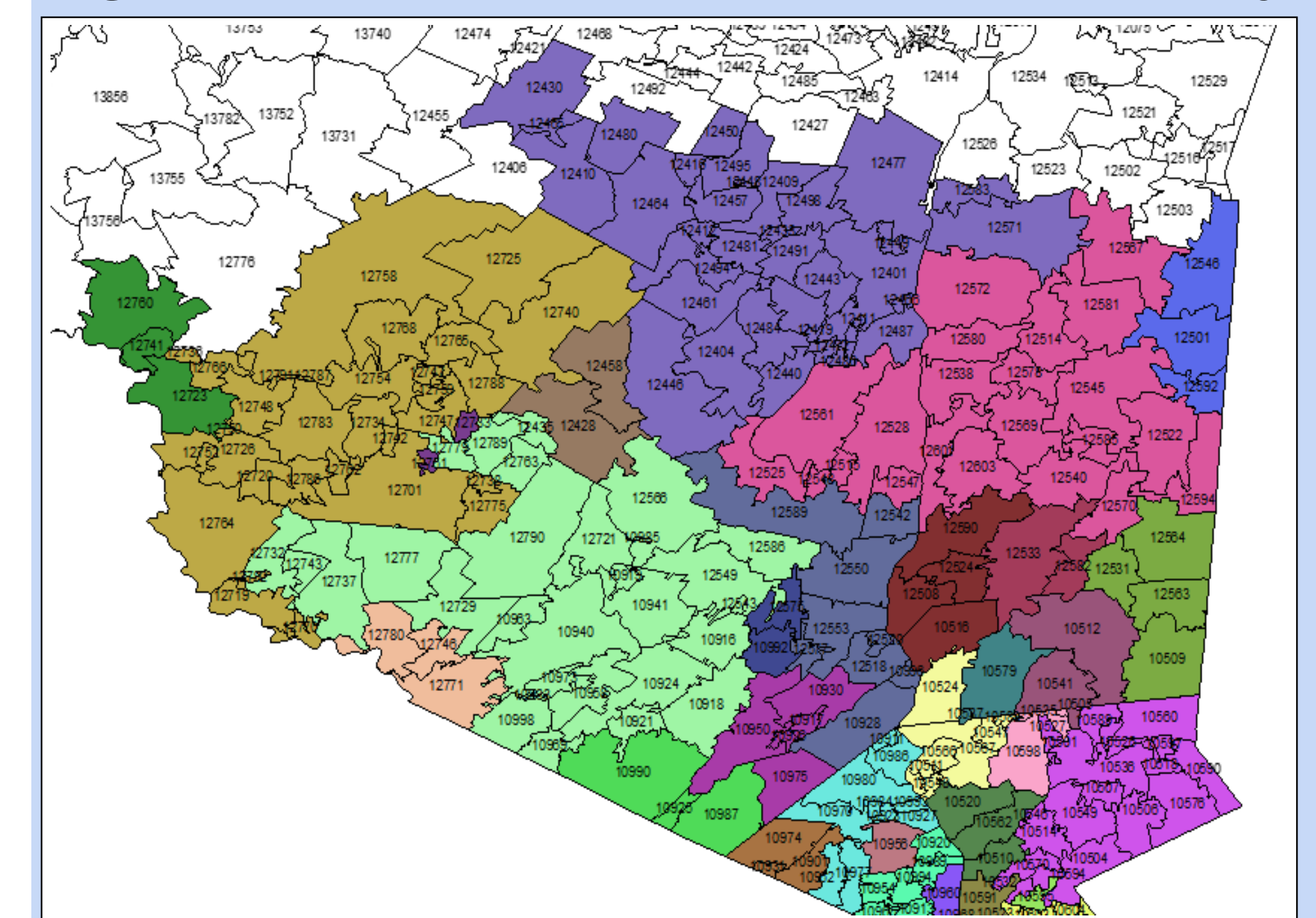
Needs Scoring

Needs scores were created for each RSA based on: first quartile: 0.25; second quartile: 0.50; third quartile: 0.75; and fourth quartile: 1.00 of the sum score of each data element. RSAs with the with highest value displayed most need. RSAs in the fourth quartile were identified as those with the highest need.

RESULTS

Based on shortage area guidelines, RSAs were revised.

Figure 3. Revised RSAs for Lower Hudson Valley



There were 279 RSAs initially created. These were revised to 277 RSAs.

Table 1. Revised RSAs by NYS Department of Labor Regions

Region	Total Medicaid Patients	Local-ization (%)	# ZIPs	# RSAs	# ZIPs /RSA	Total Pop	Pop /RSA
Capital District	236,357	64.34	262	16	16.4	1,085,965	67,873
Central NY	217,954	66.31	145	13	11.2	814,919	62,686
Finger Lakes	346,671	53.85	193	21	9.2	1,219,131	58,054
Hudson Valley	516,318	61.38	326	39	8.4	2,301,120	59,003
Long Island	453,580	41.03	207	48	4.3	2,871,770	59,829
Mohawk Valley	134,275	68.16	165	13	12.7	506,780	38,983
New York City	3,703,310	32.26	311	67	4.6	8,270,869	123,446
North Country	98,083	82.29	182	15	12.1	428,539	28,569
Southern Tier	184,796	68.08	158	18	8.8	640,599	35,589
Western NY	440,247	42.67	209	27	7.7	1,39,6367	51,717
Statewide	6,331,591	42.12	2,158	277	7.8	19,536,059	70,527

RSAs with the highest need were spread across New York State.

Table 2. Count of RSAs in Quartiles by NYS Department of Labor Regions

Region	# RSAs	Quartiles				Percent
		First	Second	Third	Fourth	
Capital District	16	6	3	6	1	6.3%
Central NY	13	6	4	2	1	7.7%
Finger Lakes	21	6	6	6	3	14.3%
Hudson Valley	39	17	13	4	5	12.8%
Long Island	48	16	19	8	5	10.4%
Mohawk Valley	13	1	3	7	2	15.4%
New York City	67	7	8	17	35	52.2%
North Country	15	1	4	4	6	40.0%
Southern Tier	18	1	4	8	5	27.8%
Western NY	27	4	3	6	14	51.9%

CONCLUSIONS

RSAs with high needs were located in both urban and rural areas, demonstrating the importance of community characteristics in identifying need. This type of analysis can assist policy makers in identifying health care needs within specific communities, especially for more vulnerable populations. Improving the availability of data would make RSA development more useful to policy makers and researchers.