Kings and Queens: Winning Over Hearts and Minds

By Christopher Spangler

Primary Question/Problem

- How can the New York State Hospital System best allocate resources to Hospitals within the five boroughs of NYC, with respect to what types of illnesses, and why?

Solution and Reasoning

- After an analysis based involving the Medicaid Community, it is evident that resources would be best allocated to select parts of Kings County (Brooklyn) and Queens County (Queens). It would be best allocated to inpatient treatment for cardiovascular and mental health disorders. Brooklyn and Queens were chosen as areas of concern because those two areas had the highest rates of hospitalizations based on ER visits.

- If a chronically-ill Medicaid patient were to visit the ER in Brooklyn or Queens, based on the analysis, there would be a very high probability of them being admitted, especially if they had a disorder of the cardiovascular system or a mental disorder.

Background on the Data

- Data source: "Medicaid chronic conditions, inpatient admissions and emergency room visits by ZIP Code: beginning 2012" and ending at the end of 2014.

- The data set contains information on specific chronic health conditions in the Medicaid population, as it relates to the five boroughs. The chronic health conditions were identified through software and Medicaid enrollment, eligibility, encounter, claim, and Pharmacy data over three 12 month periods. The chronic health category is represented in the datafile are: diabetes, diseases of the cardiovascular system, diseases of the respiratory system, HIV infection, mental disorders, newborn disorders, and substance abuse disorders. All conditions that have 20 or less unique beneficiaries are suppressed from this data file.

- This data set was found at the government website, HTTPS://health.data.ny.gov/

Beneficiaries with ER Visits, as Compared to total ER Visits, In and out of NYC

BWERV vs. Total ERV
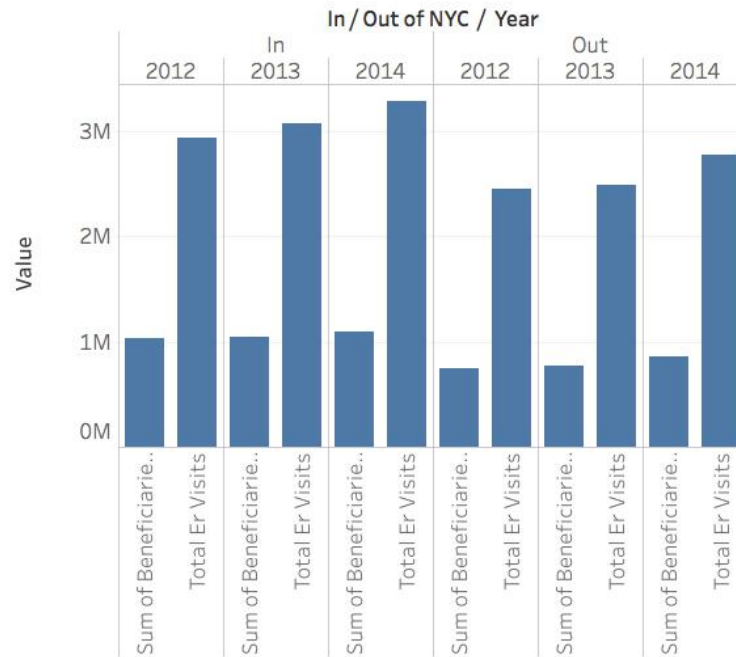
Sum of Beneficiaries With Er Visits and Total Er Visits for each Year broken down by In / Out of NYC. Color shows details about sum of Beneficiaries With Er Visits and Total Er Visits.

Measure Names
- Sum of Beneficiaries With Er Visits
- Total Er Visits

Even though the five boroughs of NYC are contained within NY State, there are more Medicaid beneficiaries in the 5 boroughs, as well as more ER visits with respect to Medicaid patients, within said boroughs. This can be seen as a way to justify the focus of more Medicaid resources to the city, although it goes without saying that all Medicaid patients are important throughout the entire State of New York.

Reasons for ER Visits and Admissions
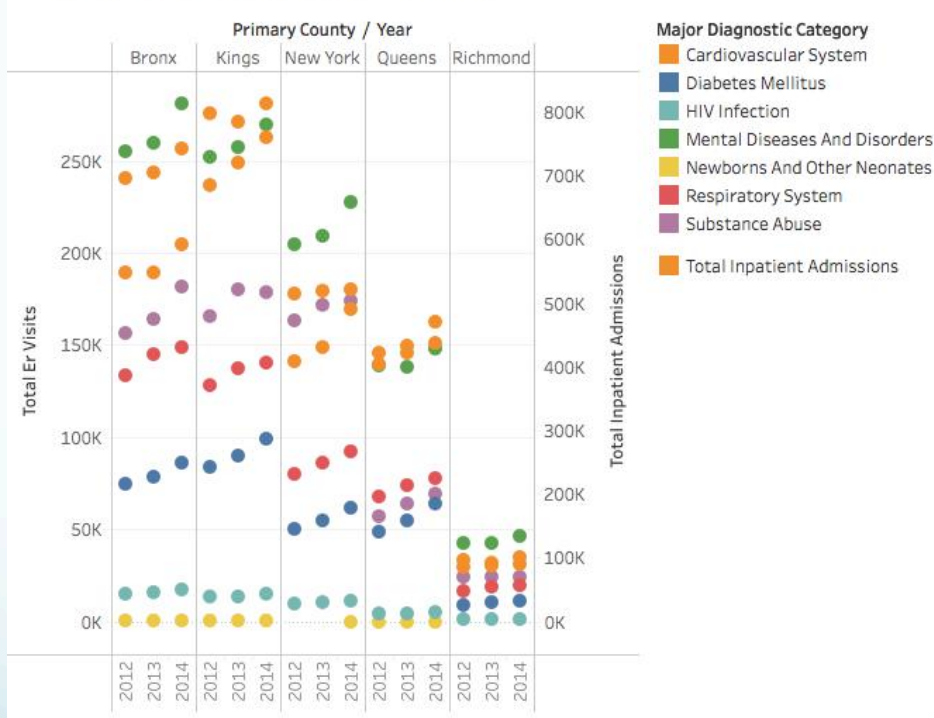
In almost all cases, the rate of both ER visits and inpatient admissions remains stable for all major diagnostic categories, with a very slight upward trend. This is most likely attributable to an increase in population, an increase in Medicaid enrollment, or possibly both.

The total number of ER visits and the total number of inpatient admissions seemed to be proportional to the relative population of their respective boroughs.

Because of the fact that they were only three years used in the Data, linear regression was deemed unwarranted.

Reasons for ER Admissions

		Primary County				
Year	Major Diagnostic Category	Bronx	Kings	New York	Queens	Richmond
2012	Mental Diseases And Diso..	151,574	162,937	126,964	87,851	24,767
	Cardiovascular System	224,827	315,920	146,809	185,520	30,670
	Substance Abuse	155,554	141,032	148,837	52,360	21,013
	Respiratory System	80,904	83,418	45,408	42,746	10,072
	Diabetes Mellitus	71,334	86,812	41,026	50,697	8,326
	HIV Infection	11,151	7,958	6,239	2,444	694
	Newborns And Other Neo..	510	411		55	
2013	Mental Diseases And Diso..	153,775	154,899	123,363	85,263	23,689
	Cardiovascular System	223,918	310,860	150,939	182,179	30,751
	Substance Abuse	158,145	136,986	145,808	55,410	18,500
	Respiratory System	83,622	84,752	47,921	43,419	10,190
	Diabetes Mellitus	74,447	88,897	44,206	52,265	8,661
	HIV Infection	10,918	7,539	6,476	2,430	682
	Newborns And Other Neo..	399	414		92	
2014	Mental Diseases And Diso..	159,565	160,370	126,633	89,459	26,670
	Cardiovascular System	236,613	321,284	156,780	186,109	33,252
	Substance Abuse	163,315	141,185	137,313	58,751	20,334
	Respiratory System	88,635	88,602	49,176	45,675	11,105
	Diabetes Mellitus	81,831	93,195	46,171	55,320	9,810
	HIV Infection	11,646	7,901	6,054	2,570	714
	Newborns And Other Neo..	318	287	22	32	

According to this table, Mental Disorders, Disorders of the Cardiovascular System, and Substance Abuse were the leading causes of admissions from the ER. After those reasons, there is an evidently sharp decline of admissions, with some instances of less than 20 for Newborn/Natal issues, hence the suppression of data in that specific category.

# ER Visits that Result in Admissions, per Borough, per year.
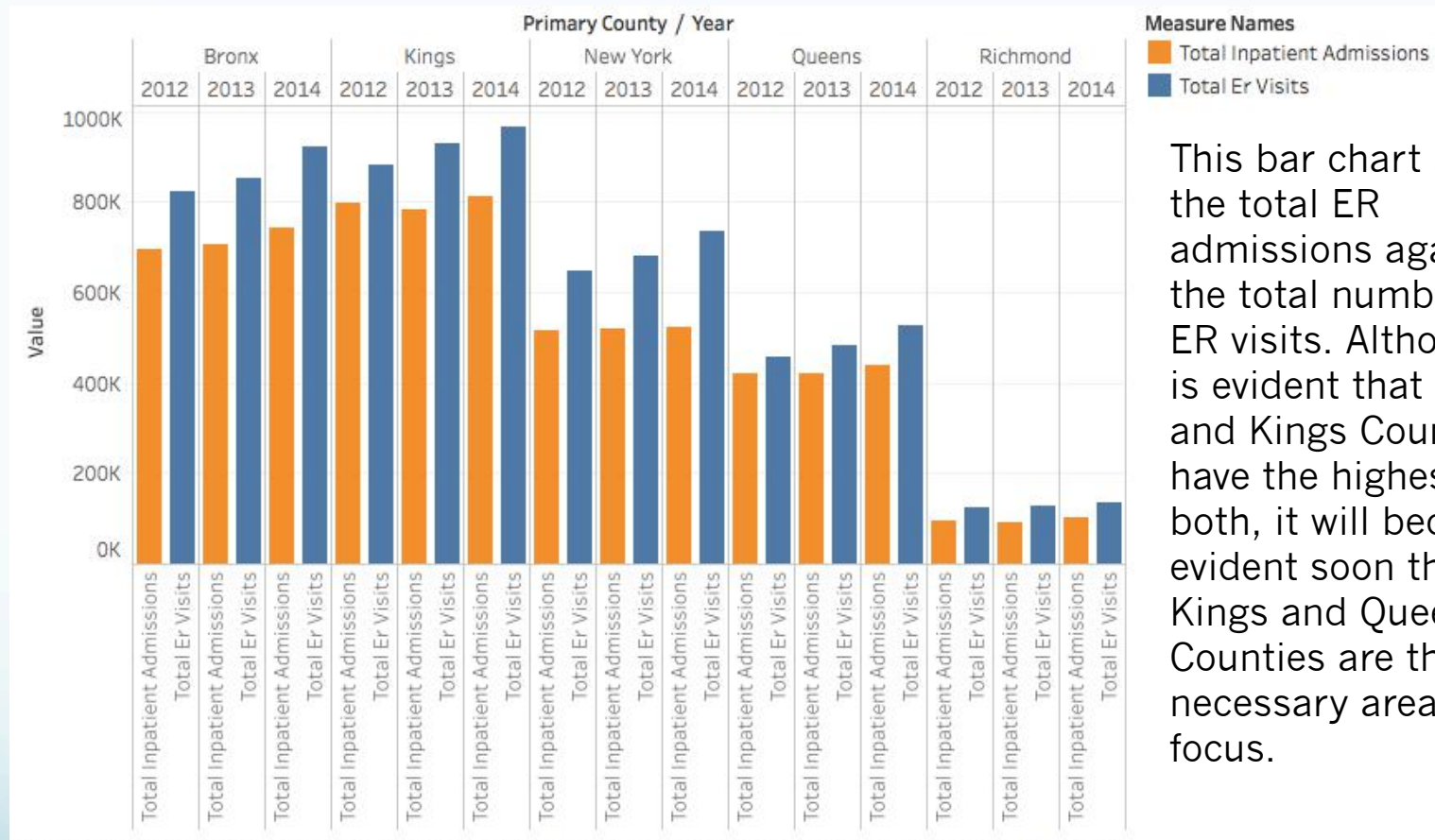
This bar chart shows the total ER admissions against the total number of ER visits. Although it is evident that Bronx and Kings Counties have the highest of both, it will become evident soon that Kings and Queens Counties are the necessary areas of focus.

…The Same Data, Percentage-Wise

Year	Primary County	ER Visits/ Admissions	Total Inpatient Admissions	Total Er Visits
2012	Bronx	84.38%	695,854	824,661
	Kings	90.68%	798,488	880,557
	New York	79.42%	515,283	648,776
	Queens	92.49%	421,673	455,897
	Richmond	77.65%	95,542	123,038
2013	Bronx	82.65%	705,224	853,278
	Kings	84.54%	784,347	927,831
	New York	76.17%	518,713	681,031
	Queens	86.96%	421,058	484,198
	Richmond	72.83%	92,473	126,976
2014	Bronx	80.58%	741,923	920,683
	Kings	84.19%	812,824	965,506
	New York	70.96%	522,149	735,807
	Queens	83.03%	437,916	527,407
	Richmond	75.82%	101,885	134,377

Although admissions rates fell for almost all counties over the three-year period, in every year, both Kings and Queens counties have the highest admission rates for ER visits, with Queens having a noticeable 92.5% admissions rate in 2012. Again, linear regression was not deemed necessary for only 3 data/ year points.
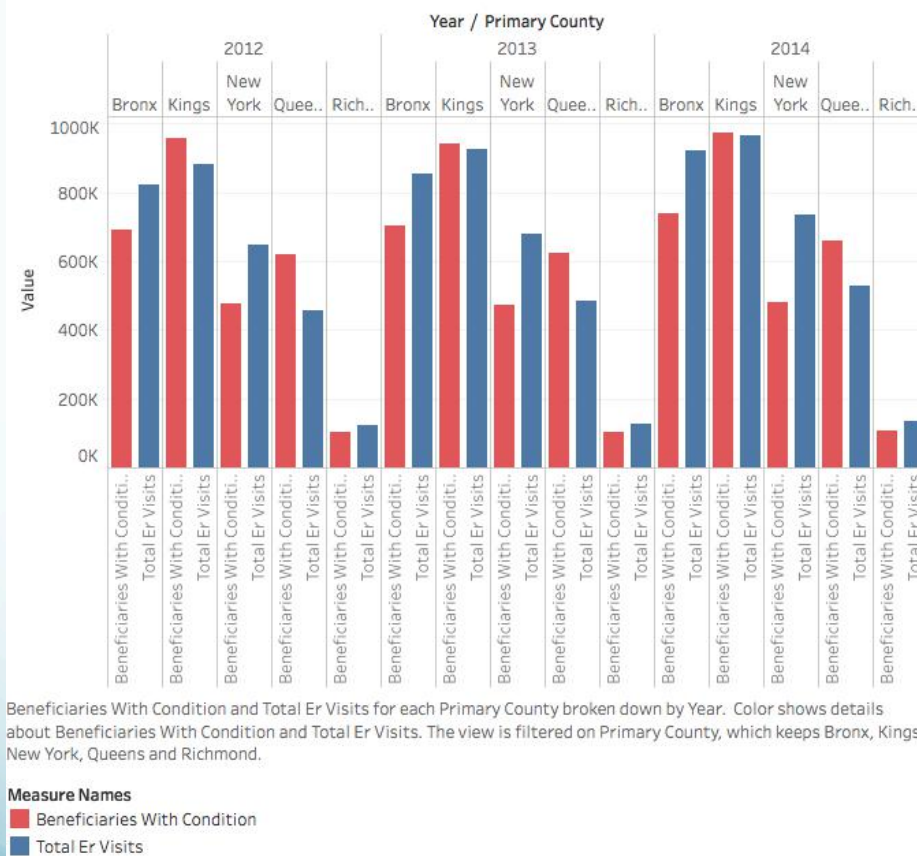
ER Visits that Result in Admissions: Refocusing on Kings and Queens
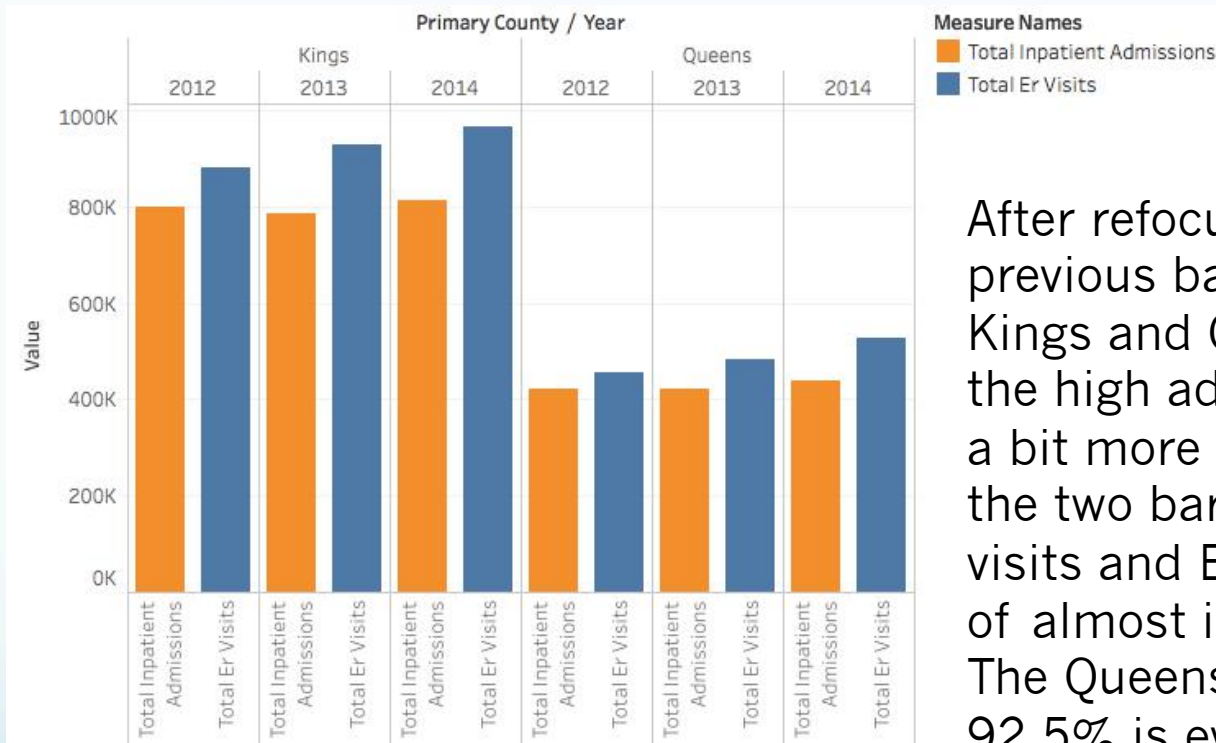
After refocusing from the previous bar chart on only Kings and Queens Counties, the high admissions rates are a bit more evident visually, as the two bars representing ER visits and ER admissions are of almost identical height. The Queens County's 2012 92.5% is even more evident and stark in contrast.

Cause for Concern…

Beneficiaries and ER Visits

Beneficiaries With Condition and Total Er Visits for each Primary County broken down by Year. Color shows details about Beneficiaries With Condition and Total Er Visits. The view is filtered on Primary County, which keeps Bronx, Kings, New York, Queens and Richmond.

Measure Names
- Beneficiaries With Condition
- Total Er Visits

To illustrate the problem a little bit more, this bar chart serves to show that in all three years, both Kings and Queens Counties had a major issue: The amount of beneficiaries with conditions was actually more than the total ER visits in these areas. This in turn would be cause for concern, as these are chronic conditions, and, with the admissions rates as high as they are, if all beneficiaries visited the hospital at once (however unlikely a scenario), there would undoubtedly be space issues with respect to availability.

The Top Ten

Highest Ten Rated Zipcodes for ER Admissions

Here are the top 10 areas with respect to admissions per beneficiary, per admission. Although there is a scattered area in the north of the map that contains the primary "offending zip code," where there is almost two hospitalizations per one beneficiary, the "Problem Area" seems to be focused on the Brighton Beach area. These four zip codes should be the focus of resources.

Problem Zip Codes in Brighton Beach

- 11235 — 1.52 Admissions / Beneficiary

- 11239 — 1.39 Admissions / Beneficiary

- 11224 — 1.27 Admissions / Beneficiary

- 11204 — 1.24 Admissions / Beneficiary

- These zip codes in the Brighton Beach area should be the focus of more Medicaid resources. An interesting question to find out in another study: Is there a geographical/socioeconomical reason that this specific area is problematic?

Conclusion

- Because of its high rate of admission, Brighton Beach is an excellent area for allocation of Medicaid resources, as there is well upwards of one admission per each Medicaid beneficiary.

- Special focus should be placed on medical access for mental disorders, disorders of the cardiovascular system, and substance abuse disorders.

- Allocation/reallocation of medical/hospital space and resources should be considered, especially since these conditions are chronic.