



Fall 2015 | Amit Goel, Aditi Jain, Anubhav Gupta
Ariana Alisjahbana, Elle Wang, Goutam Murlidhar

Agenda

- Team Overview
- Overview
- Objective
- Challenge
- Methodology
- Key Insights
- HSA Recommendations
- Limitations & Next Steps

Our Team



Amit Goel MBA



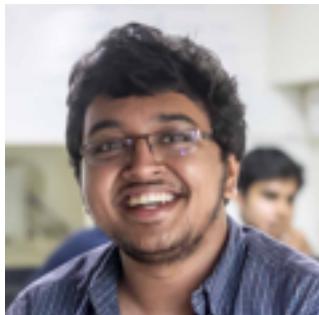
Aditi Jain MBA



Anubhav Gupta MIMS



Ariana Alisjahbana
MBA



Goutam Murlidhar
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Elle Wang
Operations Research



Carol Durham
Accenture Mentor



JOAN POULSEN
HOSPITAL AUXILIARY

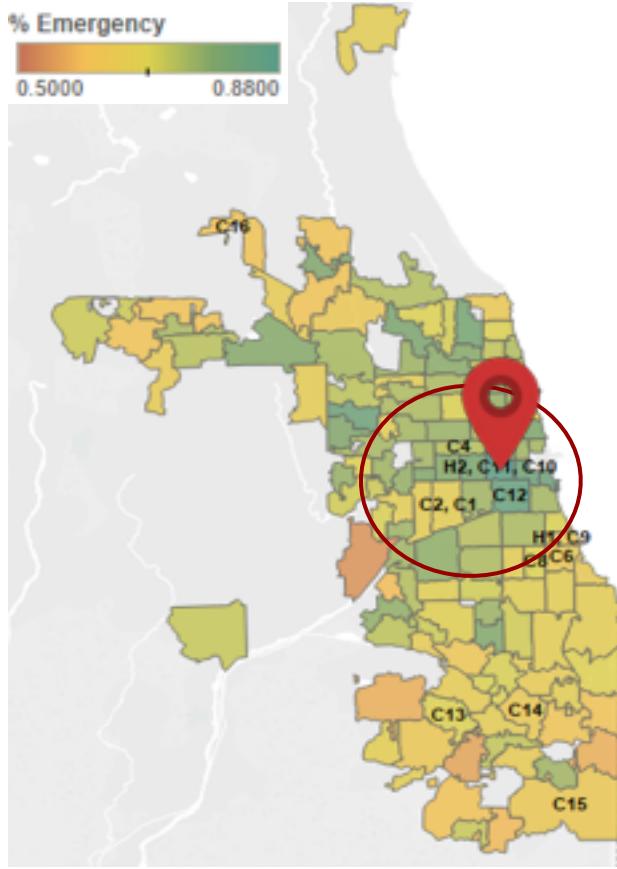
Our Objective: Keeping Cook County Hospital as the safety net hospital for everyone

- Keeping Cook County's mission alive by improving its payer mix
- Reduce cost and improve quality of care

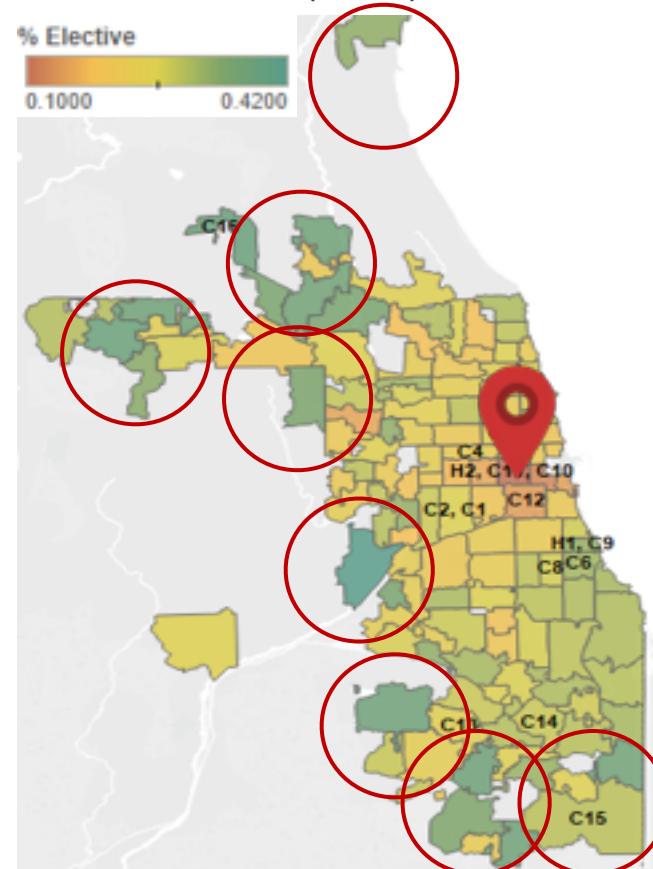


A Tale of Two Hospitals...

Emergency visits (72%)



Elective visits (24%)



Cook County Hospital faces two different challenges

- > **Emergency admits** are high volume and costly

Patients with preventable diseases should be treated earlier before they become emergency patients

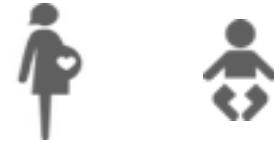
- > **Elective patients** bring revenue but the hospital is losing them

The hospital needs to increase its share of elective patients

We identified two HSAs for Cook County to help solve these challenges

1) Mother and Baby

- a) Open speciality clinics or partner with OB-GYN clinics in the areas far away from hospitals.
- b) Create campaigns targeting African American moms/couples as expanding.



Medicaid is

2) Cook County CHRONIClers

- a) Open or partner with clinics to provide ambulatory care in high risk areas.
- b) Create a community outreach program targeting 40-65 year old adults and raise awareness about available ambulatory care and medicaid eligibility.



Cook County - Data Overview

Individual data point = Hospital Discharge



1.19M

Records in
Truven Db



74K

Unique discharges
over 3 yrs



71.5K

Discharges
for IL over 3 yrs



3

Years of data
(2011-13)

Methodology

Bottom Up
Exploration



Top Down
Exploration



Identified
important
features



Defined
HSA



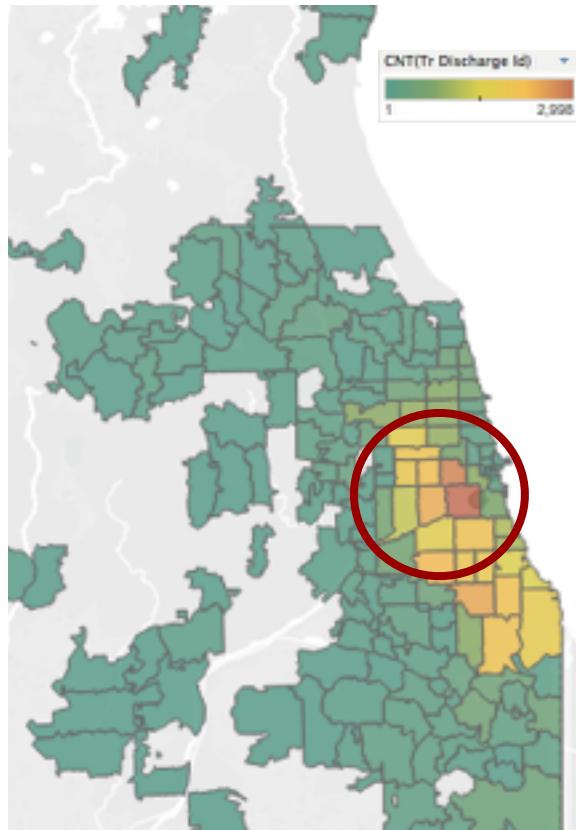
Recommendations

Repeatable across hospitals

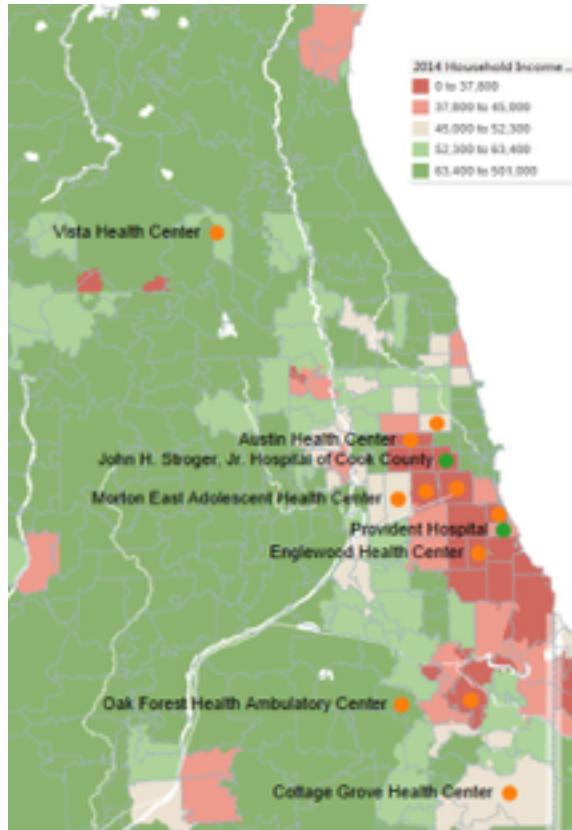
DATA EXPLORATION BOTTOM UP & TOP-DOWN

The majority of Cook County Hospital patients come from low-income zip codes

Total discharges, 2011-13

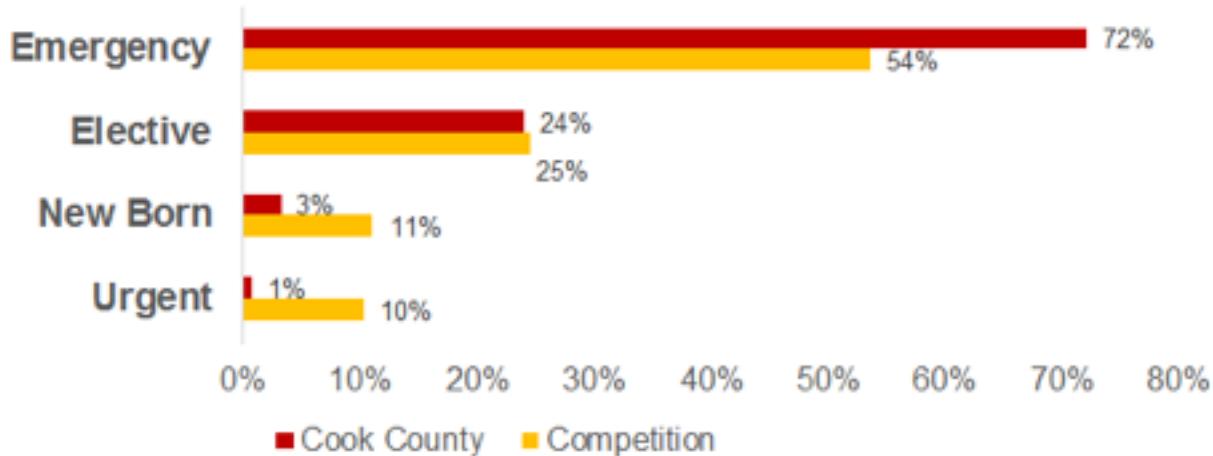


Household income and facility location, 2014



72% of all discharges are Emergency room admits vs. 54% for all other hospitals in the competition.

Admit-Type mix of Cook County Hospital vs Competition (2011-13)



% of elective is similar to the competition

Emergency Patients most commonly use Gastroenterology, Cardiology, Pulmonary, and Neurology service lines

Cook County's Service Lines by Payer Code, EMERGENCY only

Service Line	Self Pay	Medicaid	Commercial
MEDICINE	6,187	2,659	356
GASTROENTEROLOGY	3,482	1,262	139
CARDIOLOGY	2,670	1,003	105
PULMONARY	2,661	1,518	189
GENERAL SURGERY	2,213	849	227
NEUROLOGY	1,907	668	115
HEMATOLOGY/ONCOLOGY	1,826	942	83
ENDOCRINOLOGY	754	223	25
ORTHOPEDICS	745	315	102
NEPHROLOGY	688	316	27
SUBSTANCE ABUSE	529	229	10
HIV	430	370	21
GYNECOLOGY	306	83	11
UROLOGY	301	84	15
NEUROSURGERY	290	93	24
PSYCHIATRY	266	118	13
OTOLARYNGOLOGY	198	79	15
OBSTETRICS	102	135	24
VASCULAR SURGERY	100	45	3
CARDIAC SURGERY	86	16	1
NEONATOLOGY	63	61	8
NORMAL NEWBORN	5	6	
REHABILITATION		2	
Grand Total	25,809	11,076	1,513



Service Line
MEDICINE
GASTROENTEROLOGY
CARDIOLOGY
PULMONARY
GENERAL SURGERY
NEUROLOGY



Non-Emergency Patients receive treatment for OBGYN-related service lines

Cook County's Service Lines by Payer Code, ELECTIVE only

Service Line	Commercial	Medicaid	Self Pay
OBSTETRICS	280	2,292	406
GENERAL SURGERY	57	432	1,053
GYNECOLOGY	54	297	961
MEDICINE	48	355	594
HEMATOLOGY/ONCOLOGY	45	591	822
ORTHOPEDICS	25	161	341
CARDIOLOGY	23	165	474
GASTROENTEROLOGY	21	151	339
PULMONARY	18	171	283
UROLOGY	14	121	390
OTOLARYNGOLOGY	13	132	228
ENDOCRINOLOGY	10	53	124
CARDIAC SURGERY	9	40	117
NEONATOLOGY	8	44	33
NEPHROLOGY	6	50	130
NEUROLOGY	6	85	205
NEUROSURGERY	6	123	298
HIV	4	31	49
VASCULAR SURGERY	3	37	128
PSYCHIATRY	1	7	7
SUBSTANCE ABUSE	1	13	19
NORMAL NEWBORN		3	1
REHABILITATION		1	3
Grand Total	652	5,355	7,005

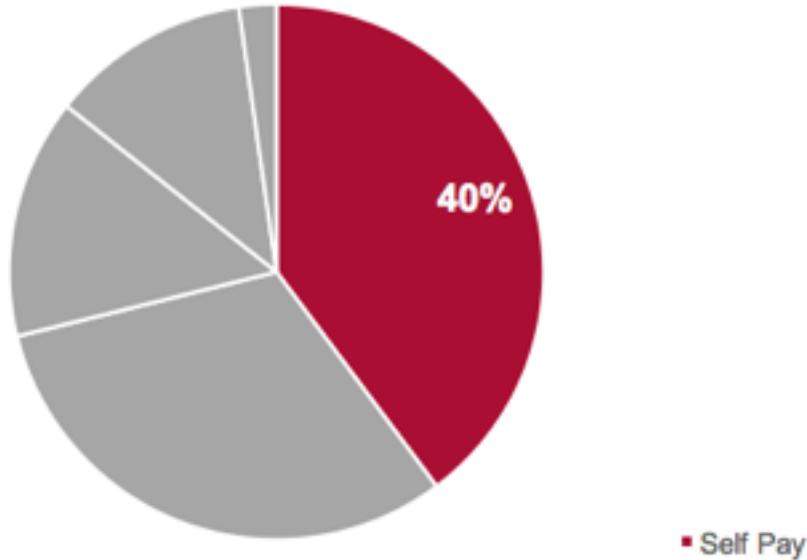


Service Line
OBSTETRICS
GENERAL SURGERY
GYNECOLOGY

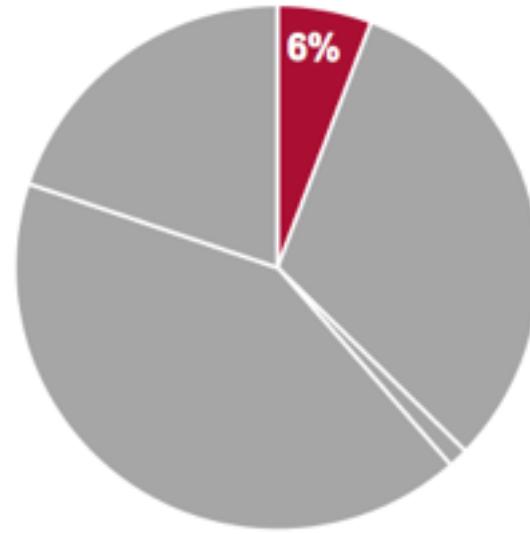


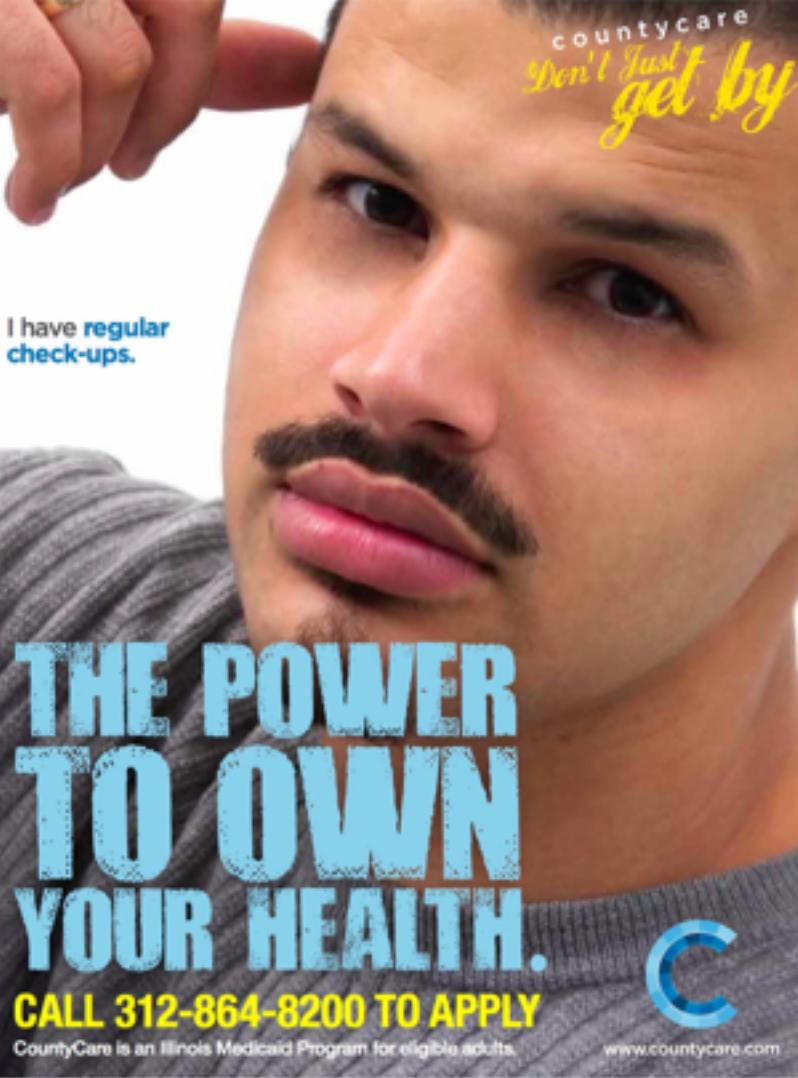
40% of all Cook county discharges are “self-pay” (uninsured) patients vs. 6% of all competitors

Cook County Hospital discharges by payer code, 2013



Competition hospitals' discharges by payer code, 2013





In January 2013, Cook County expanded Medicaid, through
“County Care”

I have regular
check-ups.

**THE POWER
TO OWN
YOUR HEALTH.**

CALL 312-864-8200 TO APPLY

CountyCare is an Illinois Medicaid Program for eligible adults.

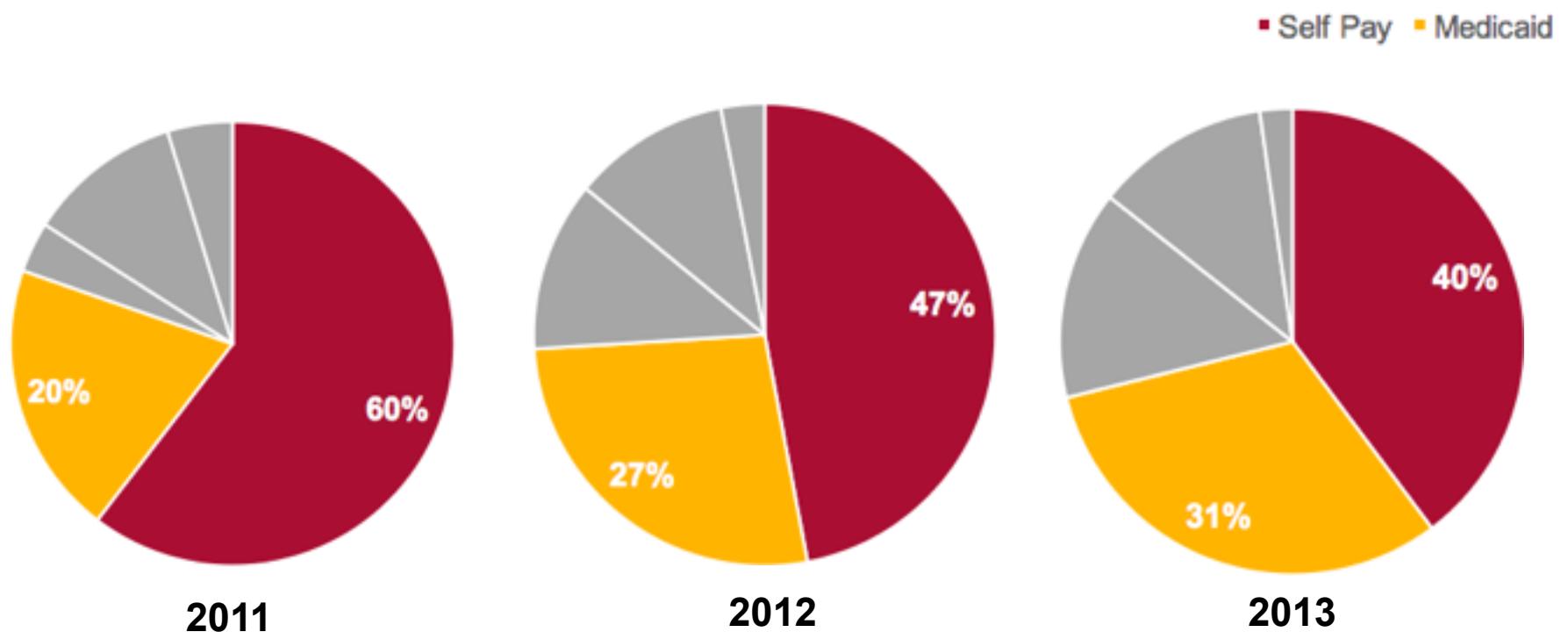
www.countycare.com

Self Pay patients will eventually become Medicaid patients; However, Cook County is losing some of these new Medicaid patients to the competition



Market Share of Self Pay & Medicaid is decreasing over three years.

Cook County Hospital discharges by payer code, 2011-13



Self Pay patients will eventually become Medicaid patients; However, Cook County is losing some of these new Medicaid patients to the competition

std_payer_code

= CHAMPUS: NOS	others (441.0)
= Commercial: NOS	others (90560.0/663.0)
= Commercial: PPO	others (727.0)
= INVALID	others (41938.0)
= Medicaid: HMO	others (125475.0/5400.0)
= Medicare: NOS (not otherwise specified)	others (119445.0/1524.0)
= Medicare: HMO	others (6304.0/54.0)
= No Charge	service_line
= No value submitted/Not stated	others (24284.0)
= Other -NOS	others (7955.0/110.0)
= Self Pay	service_line
= Worker's Compensation: NOS	others (1212.0/6.0)

= CARDIAC SURGERY	JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (178.0/63.0)
= CARDIOLOGY	JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (578.0/197.0)
= DENTISTRY/ORAL SURGERY	JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (22.0)
= ENDOCRINOLOGY	JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (151.0/52.0)
= GASTROENTEROLOGY	JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (441.0/121.0)
= GENERAL SURGERY	JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (1477.0/471.0)
= GYNECOLOGY	JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (1190.0/351.0)
= HEMATOLOGY/ONCOLOGY	JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (1028.0/232.0)
= HIV	JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (54.0/11.0)
= MEDICINE	JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (821.0/383.0)
= NEONATOLOGY	JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (61.0/28.0)
= NEPHROLOGY	JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (159.0/39.0)
= NEUROLOGY	JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (311.0/118.0)
= NEUROSURGERY	JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (463.0/178.0)
= NORMAL NEWBORN	others (40.0/1.0)
= OBSTETRICS	others (1416.0/396.0)
= OPHTHALMOLOGY	JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (22.0/5.0)
= ORTHOPEDICS	JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (624.0/298.0)
= OTOLARYNGOLOGY	JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (266.0/48.0)
= PLASTIC SURGERY	JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (34.0/6.0)
= PSYCHIATRY	others (474.0/7.0)
= PULMONARY	JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (375.0/181.0)
= REHABILITATION	others (555.0)
= SUBSTANCE ABUSE	others (263.0/19.0)
= THORACIC SURGERY	JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (89.0/22.0)
= TRANSPLANT	others (6.0)
= UNGROUPABLE	JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (57.0/22.0)
= UROLOGY	JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (450.0/70.0)
= VASCULAR SURGERY	JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (177.0/49.0)

HSA DEFINITIONS

Three HSAs based on Service Lines

1. Mother and Baby (*12% of discharges*)

GYNECOLOGY

OBSTETRICS

NEONATOLOGY

NORMAL NEWBORN



1. CHRONICles of Cook County (*38% of discharges*)

CARDIOLOGY

ENDOCRINOLOGY

GASTROENTEROLOGY

PSYCHIATRY

PULMONARY SUBSTANCE ABUSE NEUROLOGY

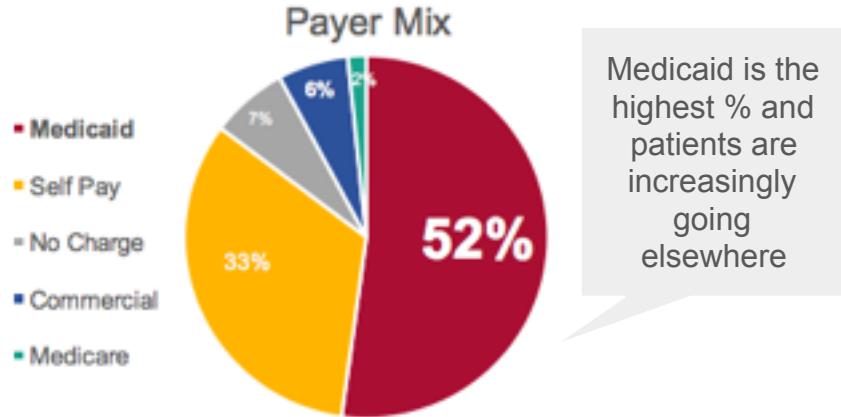


1. The Others

HSA 1: Gynaecology & Obstetrics Patients

GYNECOLOGY OBSTETRICS NEONATOLOGY NORMAL NEWBORN

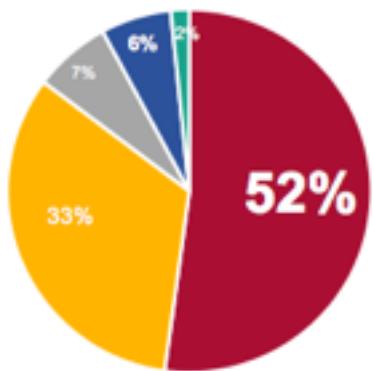
HSA#1 in Summary: Medicaid, Elective, Female, African American



HSA#1 in Summary: Medicaid, Elective, Female, African American

Payer Mix

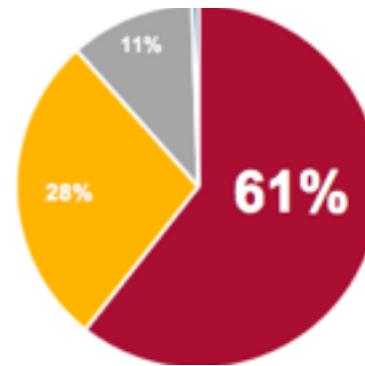
- Medicaid
- Self Pay
- No Charge
- Commercial
- Medicare



Medicaid is the highest % and patients are increasingly going elsewhere

- Elective
- Newborn
- Emergency
- Urgent

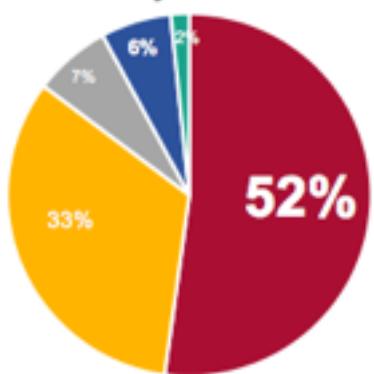
Admit Type



HSA#1 in Summary: Medicaid, Elective, Female, African American

Payer Mix

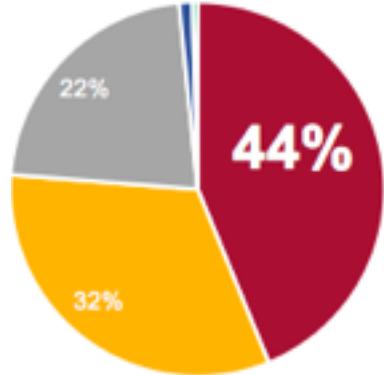
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- Self Pay
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Medicaid is the highest % and patients are increasingly going elsewhere

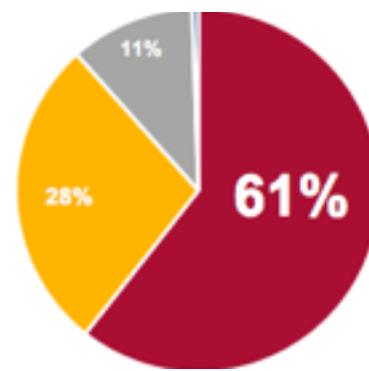
Age

- 18 to 39
- <18
- 39 to 64
- 54 to 74
- 75+



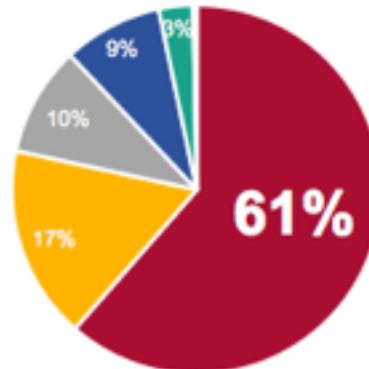
Admit Type

- Elective
- Newborn
- Emergency
- Urgent

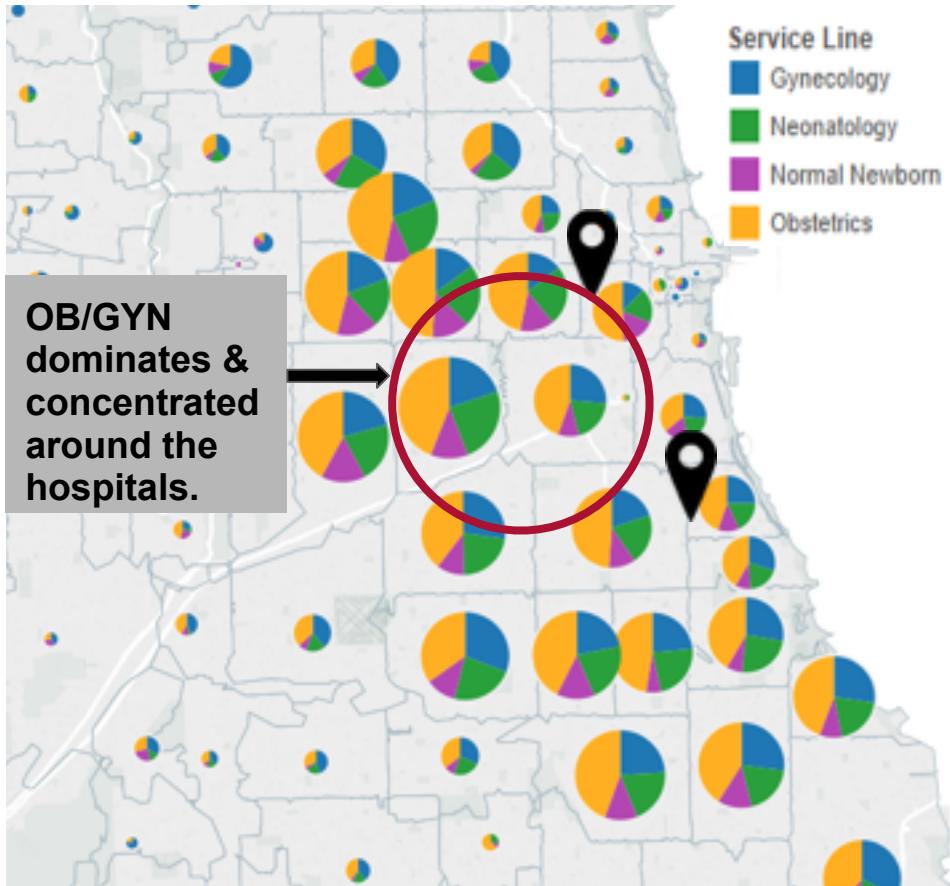


Racial Distribution

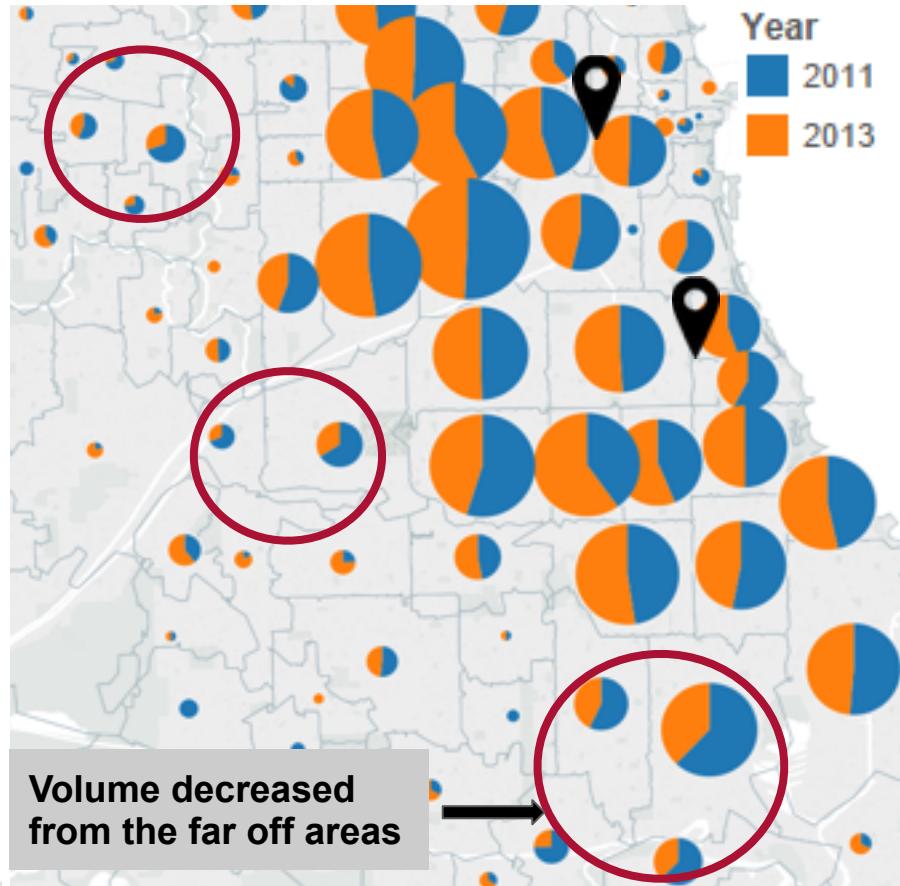
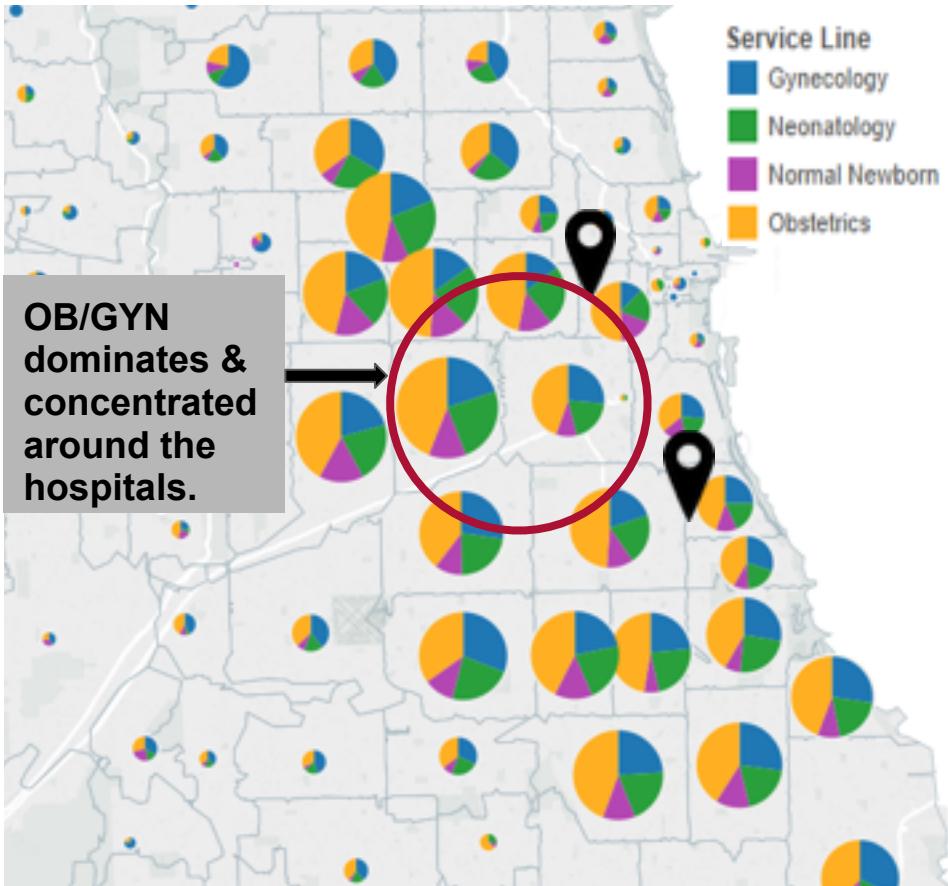
- African American
- Caucasian American
- Native American
- Other
- Asian American
- Native Hawaiian or Pacific Islander



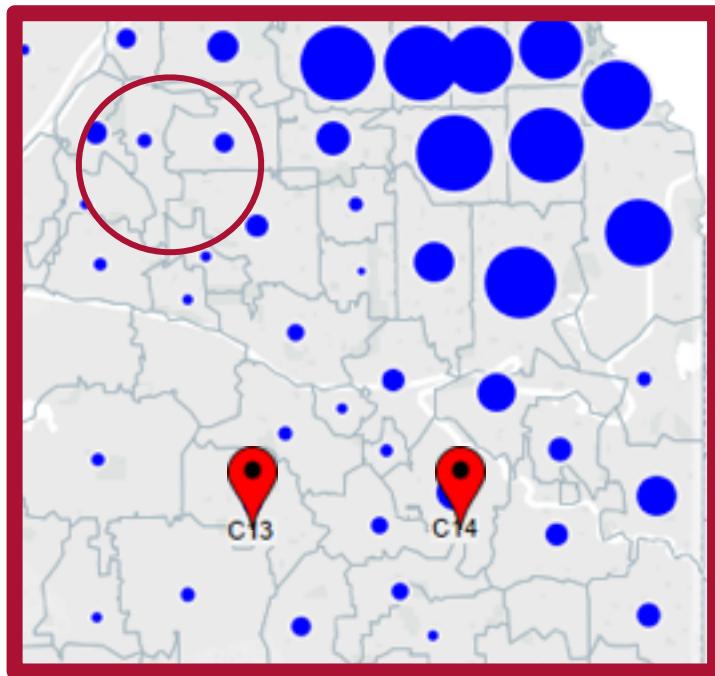
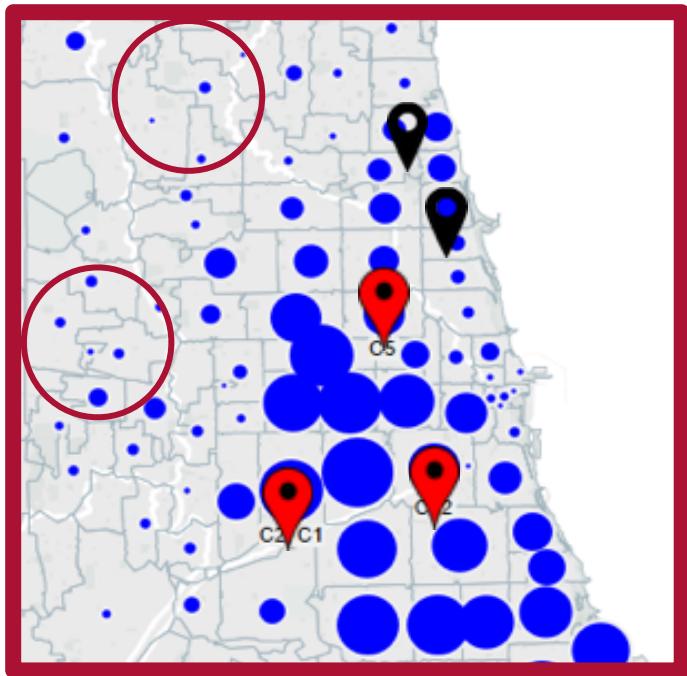
HSA#1- Volume is concentrated around the hospital; % discharges decreased from the far off areas.



HSA#1- Volume is concentrated around the hospital; % discharges decreased from the far off areas.



Recommendations for HSA #1: Open speciality clinics or partner with OB-GYN clinics in the far off areas (circled)



Create campaigns targeting African American moms/couples as medicaid is expanding.



HSA 2: High PQI Service Lines

CARDIOLOGY

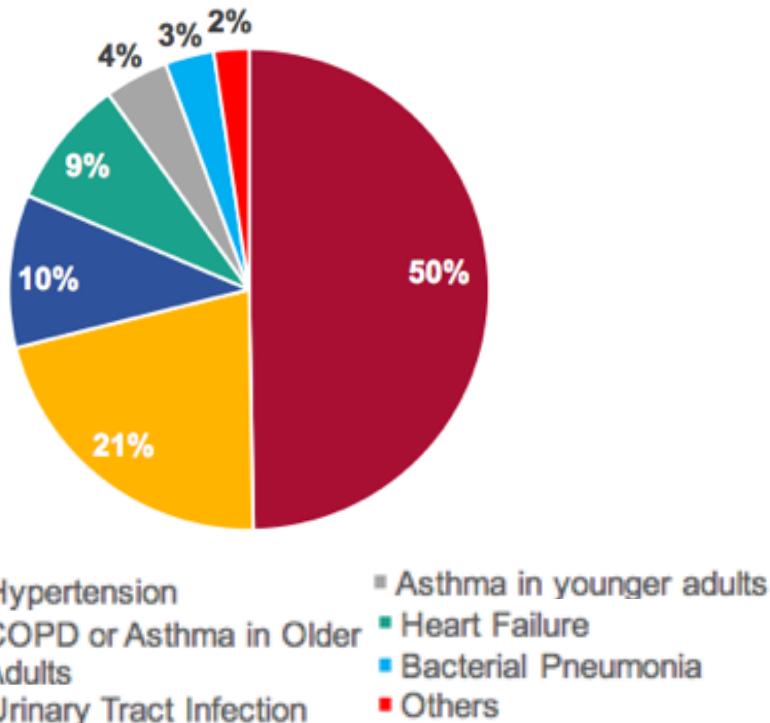
ENDOCRINOLOGY GASTROENTEROLOGY PSYCHIATRY

PULMONARY

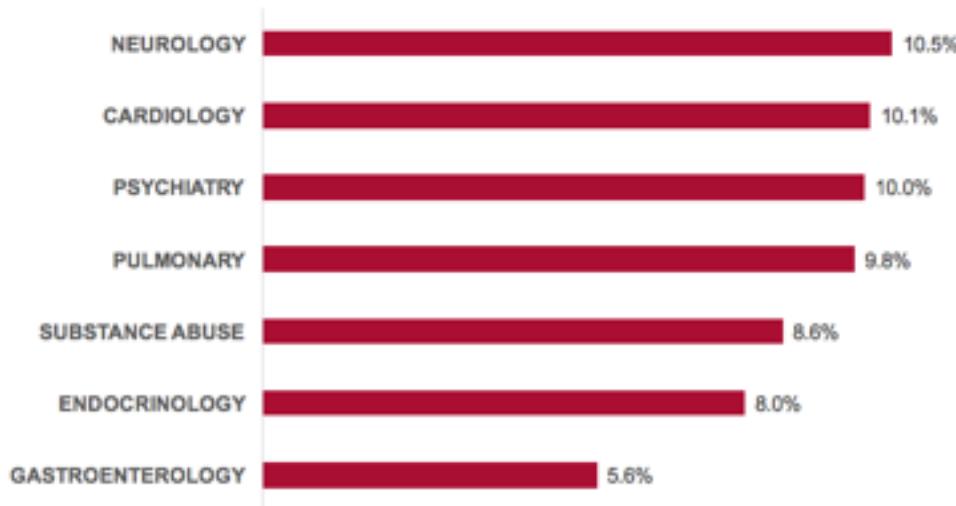
SUBSTANCE ABUSE NEUROLOGY

Three conditions account for 80% of all preventable discharges

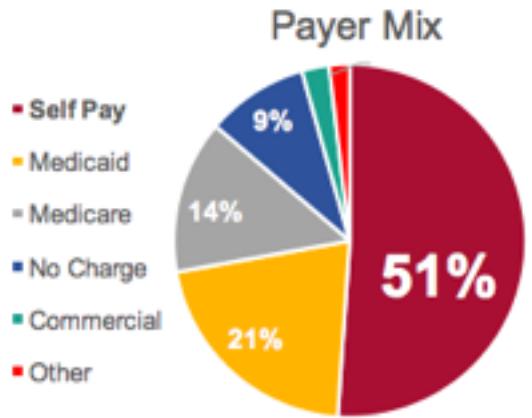
Most common TAPQ codes, 2011-13



Most common service lines with high PQI, 2011-13



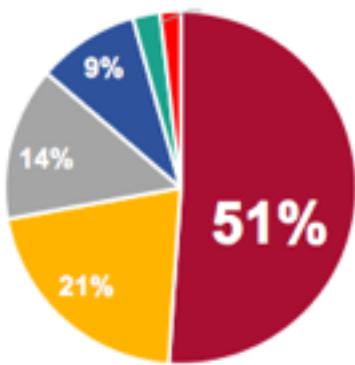
HSA#2 in summary: Self-pay, Emergency, Male, and African American



HSA#2 in summary: Self-pay, Emergency, Male, and African American

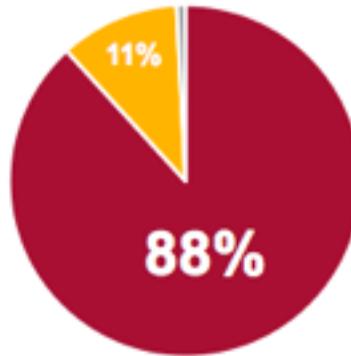
Payer Mix

- Self Pay
- Medicaid
- Medicare
- No Charge
- Commercial
- Other



Admit Type

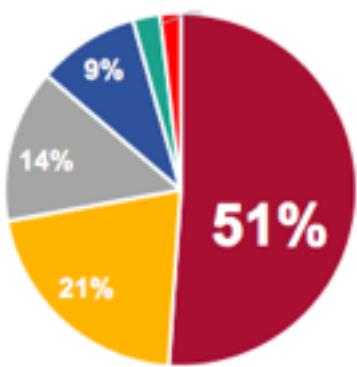
- EMERGENCY
- ELECTIVE
- URGENT



HSA#2 in summary: Self-pay, Emergency, Male, and African American

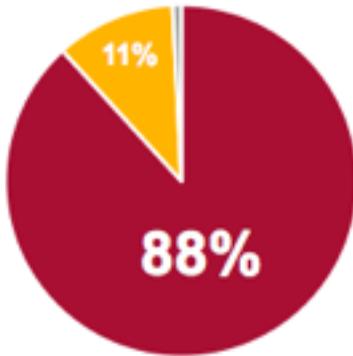
Payer Mix

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- Medicaid
- Medicare
- No Charge
- Commercial
- Other



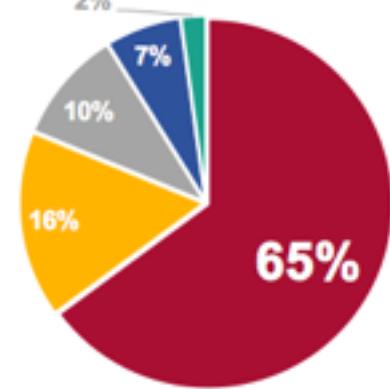
Admit Type

- EMERGENCY
- ELECTIVE
- URGENT



Age Distribution

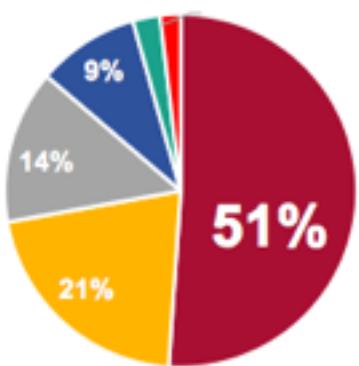
- 40 to 64
- 18 to 39
- 65 to 74
- 75+
- Under 18



HSA#2 in summary: Self-pay, Emergency, Male, and African American

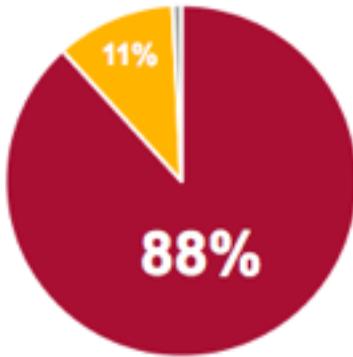
Payer Mix

- Self Pay
- Medicaid
- Medicare
- No Charge
- Commercial
- Other



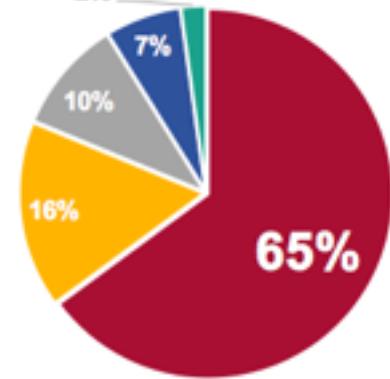
Admit Type

- EMERGENCY
- ELECTIVE
- URGENT



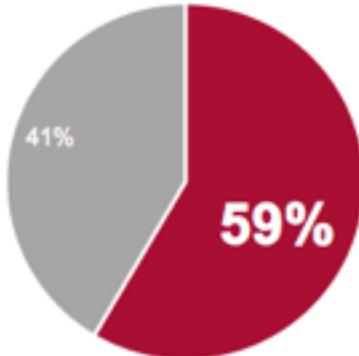
Age Distribution

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- 75+
- Under 18



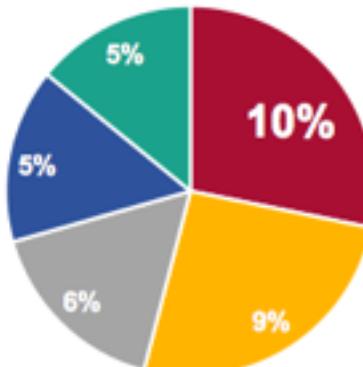
Gender Distribution

- Male
- Female



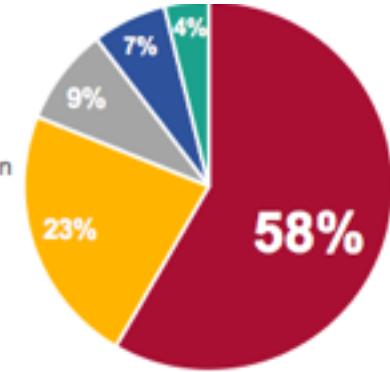
Top Diagnosis-Related Group (DRG)

- Heart Failure & shock
- Digestion
- Asthma COPD
- Pneum & pleurisy
- Bronch/asthma

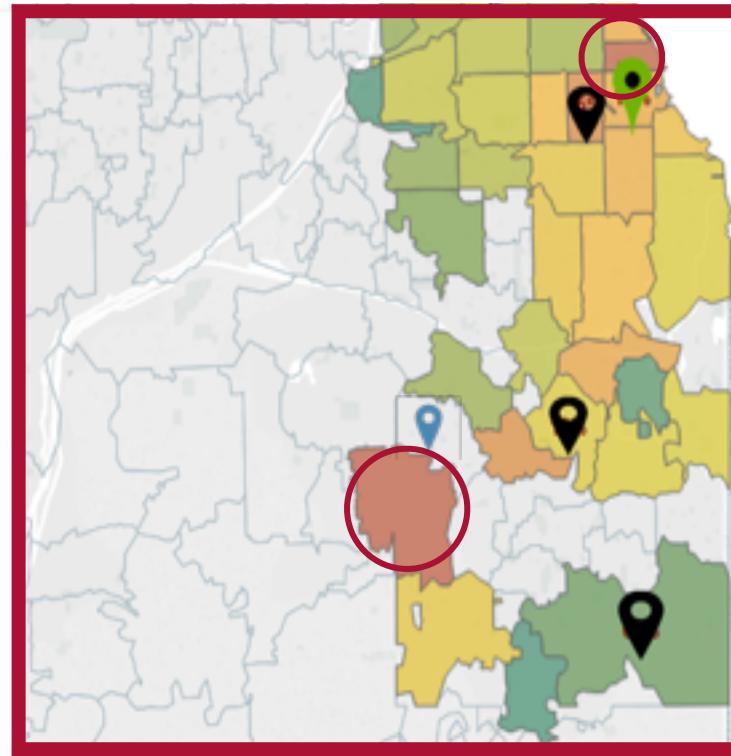
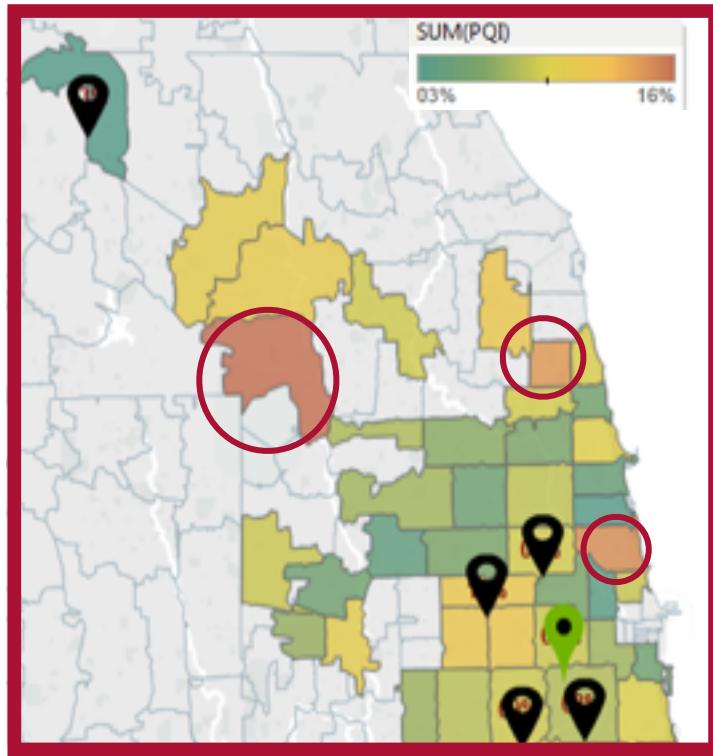


Race Distribution

- African American
- Caucasian American
- Native American
- Other
- Asian American



Open or partner with clinics to provide ambulatory care in high risk areas (circled)



* zipcode with less than 50 discharges were ignored

** PQI for a zipcode calculated as preventable/total discharges



Applicability, limitations, and next steps

This process is applicable to other hospital groups, HOWEVER...

- Models targeted to Public hospitals, mostly focused on Cook County
- A big assumption is that a larger scale rollout of medicaid will prompt patients to come to clinics before their illness become an emergency.

QUESTIONS?

APPENDIX

Cook County - at a glance

2

Second largest county in the US

5

Million county inhabitants

2

County Public Hospitals

11

County Public Clinics



Top Service lines varies for Cook County hospital vs for competitors

Cook County's top discharges by serviceline

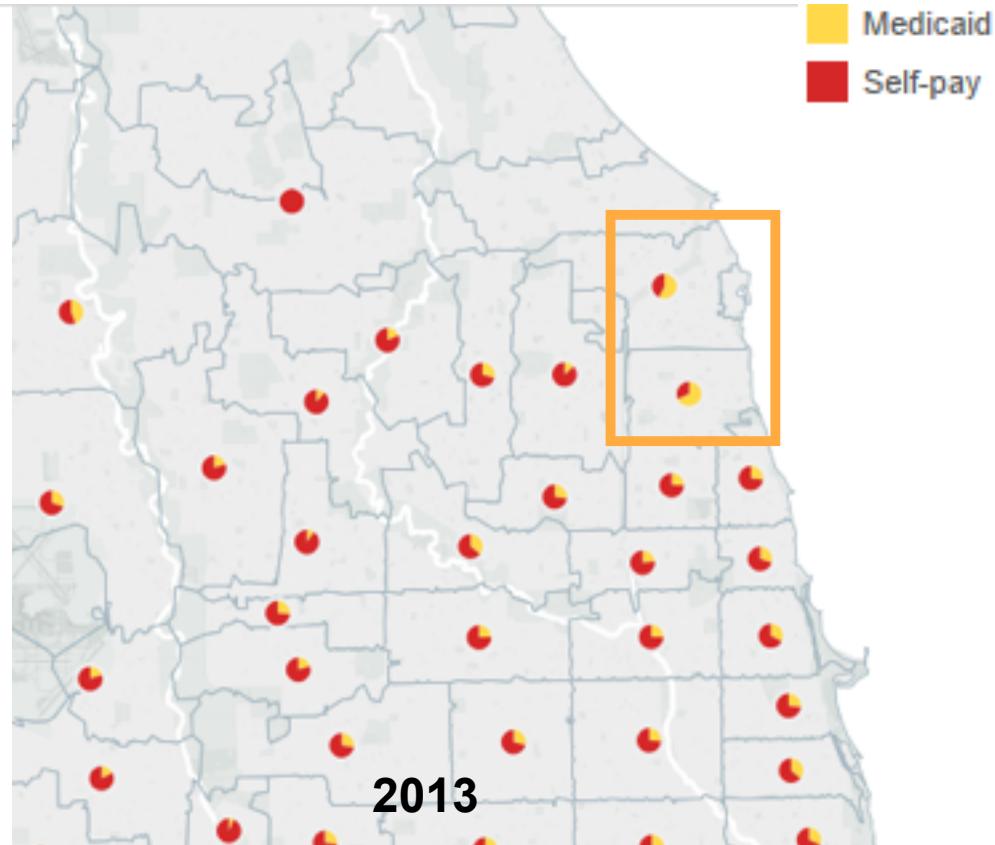
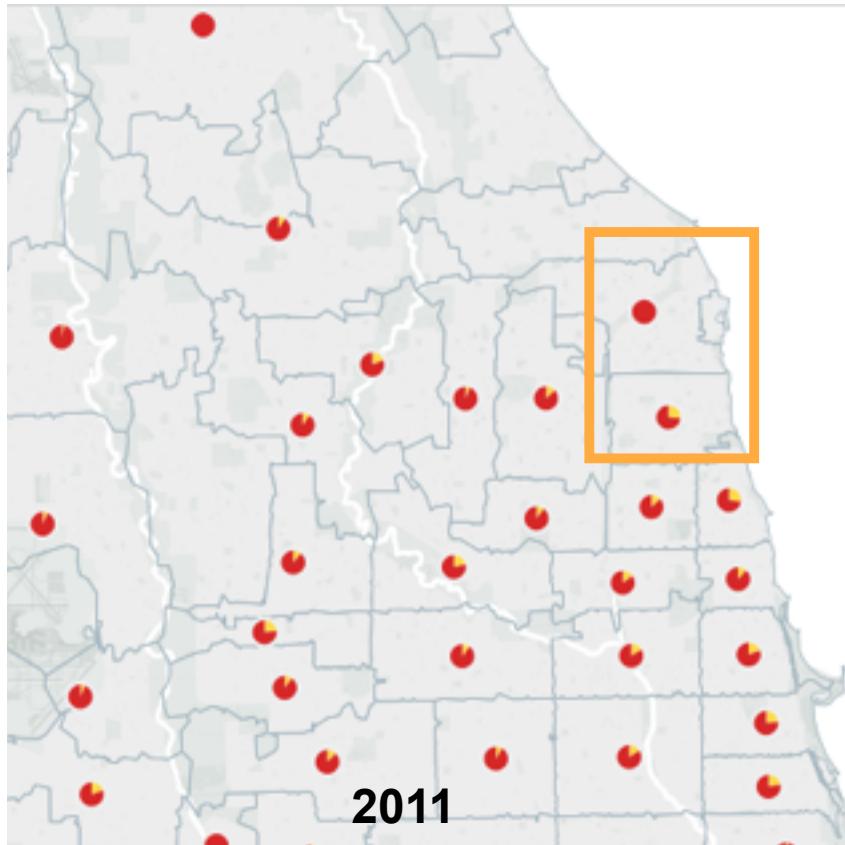
- | | |
|-------------------------|-----------|
| 1. Medicine | |
| | 20% |
| 2. Gastroenterology | 11% |
| 3. Pulmonary | |
| | 10% |
| 4. Cardiology | |
| | 9% |
| 5. Oncology | 9% |
| 6. General Surgery | 9% |
| 7. Neurology | |
| | 6% |
| 8. Obstetrics | |
| * Unique to Cook County | 5% |
| 9. Gynecology | 4% |
| 10 Orthopedics | 3% |

Competitors' top discharges by serviceline

- | | |
|--------------------------|-----------|
| 1. Medicine | 14% |
| 2. Obstetrics | 11% |
| 3. Pulmonary | 8% |
| 4. Cardiology | 8% |
| 5. Psychiatry | 7% |
| 6. Gastroenterology | 7% |
| 7. Normal Newborn | 6% |
| 8. General Surgery | 6% |
| 9. Neonatology | 5% |
| 10. Neurology | 4% |

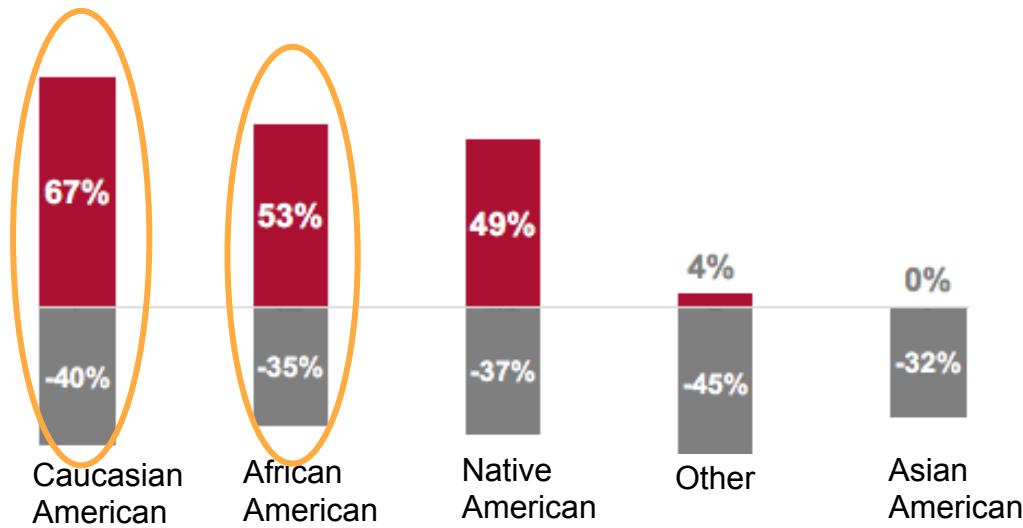
*Unique to other Hospitals

Self-Pay or uninsured discharges decreased over 3 years; Medicaid / County Care discharges expanded



Self Pay discharges are going down across all races. However, Medicaid growth is highest among Caucasian Americans

% Change in discharges for select payer codes, 2011-2013



■ Medicaid ■ Self Pay

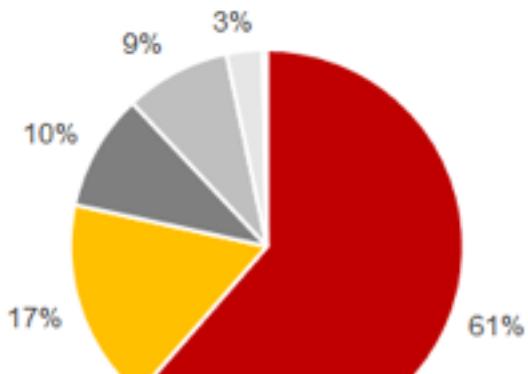
Self Pay patients will eventually become Medicaid patients; However, Cook County is losing some of these new Medicaid patients to the competition



= std_payer_code		
= CHAMPS: NOS	others (441.0)	= CARDIAC SURGERY JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (178.0/63.0)
= Commercial: NOS	others (90560.0/663.0)	= CARDIOLOGY JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (578.0/197.0)
= Commercial: PPO	others (727.0)	= DENTISTRY/ORAL SURGERY JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (22.0)
= INVALID	others (41938.0)	= ENDOCRINOLOGY JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (151.0/52.0)
= Medicaid: HMO	others (125475.0/5400.0)	= GASTROENTEROLOGY JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (441.0/121.0)
= Medicare: NOS (not otherwise specified)	others (119445.0/1524.0)	= GENERAL SURGERY JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (1477.0/471.0)
= Medicare: HMO	others (6304.0/54.0)	= GYNECOLOGY JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (1190.0/351.0)
= No Charge	service_line	= HEMATOLOGY/ONCOLOGY JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (1028.0/232.0)
= No value submitted/Not stated	others (24284.0)	= HIV JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (54.0/11.0)
= Other -NOS	others (7955.0/110.0)	= MEDICINE JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (821.0/383.0)
= Self Pay	service_line	= NEONATOLOGY JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (61.0/28.0)
= Worker's Compensation: NOS	others (1212.0/6.0)	= NEPHROLOGY JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (159.0/39.0)
		= NEUROLOGY JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (311.0/118.0)
		= NEUROSURGERY JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (463.0/178.0)
		= NORMAL NEWBORN others (40.0/1.0)
		= OBSTETRICS others (1416.0/396.0)
		= OPHTHALMOLOGY JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (22.0/5.0)
		= ORTHOPEDICS JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (624.0/298.0)
		= OTOLARYNGOLOGY JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (266.0/48.0)
		= PLASTIC SURGERY JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (34.0/6.0)
		= PSYCHIATRY others (474.0/7.0)
		= PULMONARY JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (375.0/181.0)
		= REHABILITATION others (555.0)
		= SUBSTANCE ABUSE others (263.0/19.0)
		= THORACIC SURGERY JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (89.0/22.0)
		= TRANSPLANT others (6.0)
		= UNGROUPABLE JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (57.0/22.0)
		= UROLOGY JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (450.0/70.0)
		= VASCULAR SURGERY JOHN H STROGER JR HOSPITAL OF COOK COUNTY - 140124 (177.0/49.0)

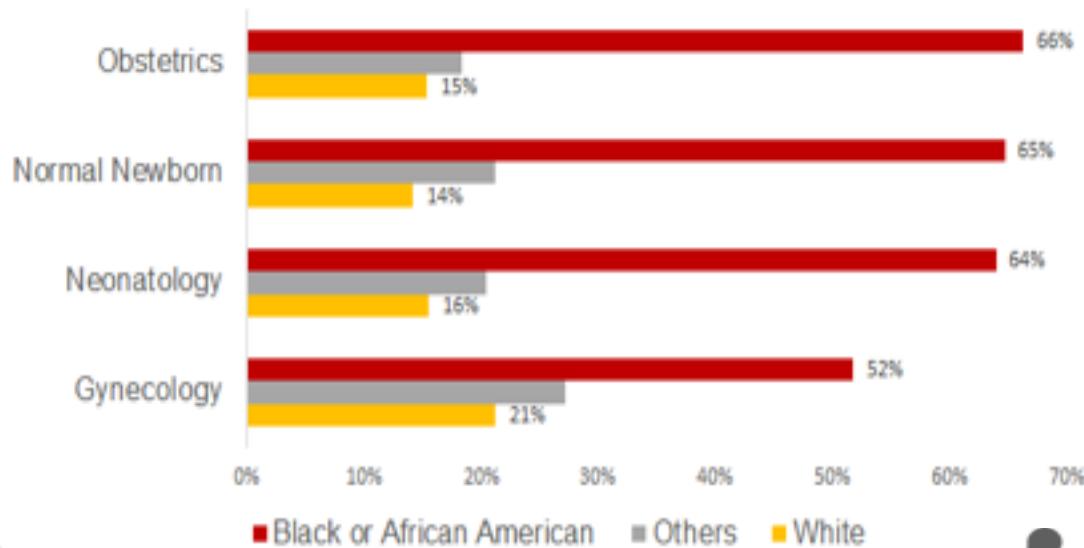
HSA#1- Patients are predominantly African American & Caucasian American; follows the overall trend of the Cook County Hospital.

Discharges by Race 2011-13



- African American
- American Indian or Alaska Native
- Asian
- White
- Other Race
- Native Hawaiian or Pacific Islander

Discharges by Race & Serviceline 2011-13



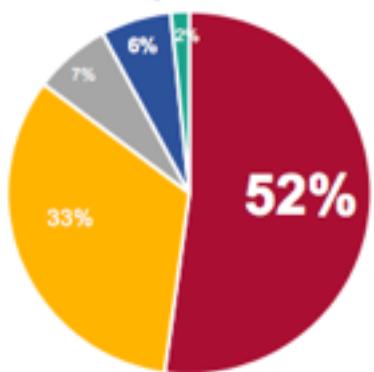
- Black or African American
- Others
- White



HSA#1 in Summary: Medicaid, Elective, Female, African American

Payer Mix

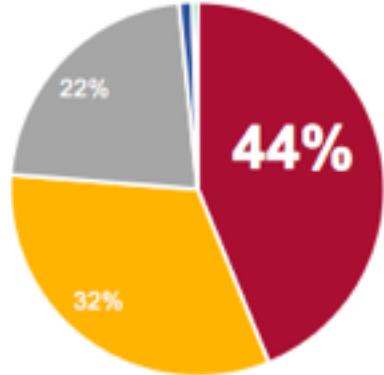
- Medicaid
- Self Pay
- No Charge
- Commercial
- Medicare



Medicaid is the highest % and patients are increasingly going elsewhere

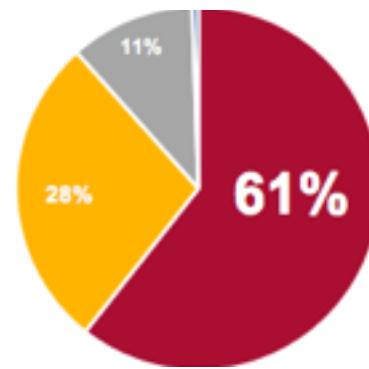
Age

- 18 to 39
- <18
- 39 to 64
- 54 to 74
- 75+



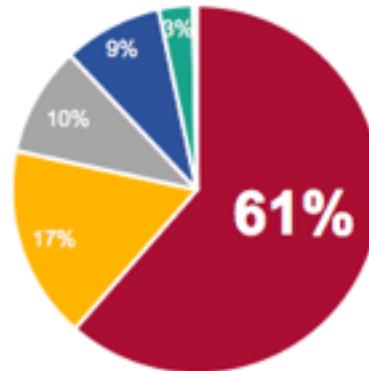
Admit Type

- Elective
- Newborn
- Emergency
- Urgent

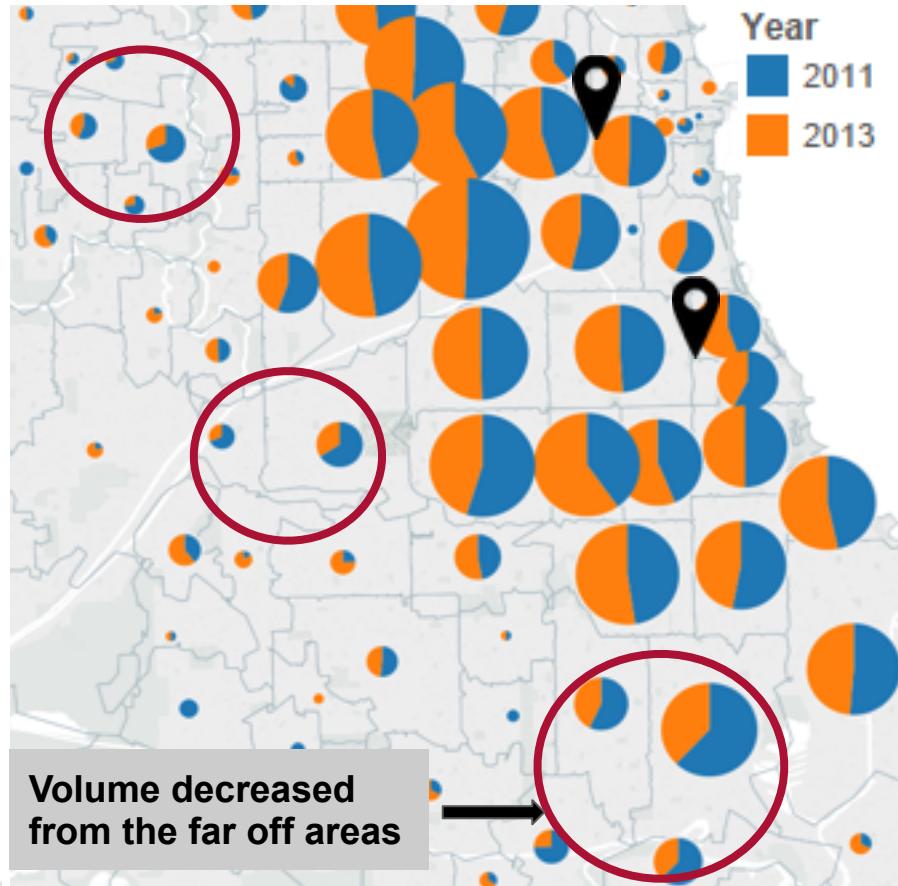
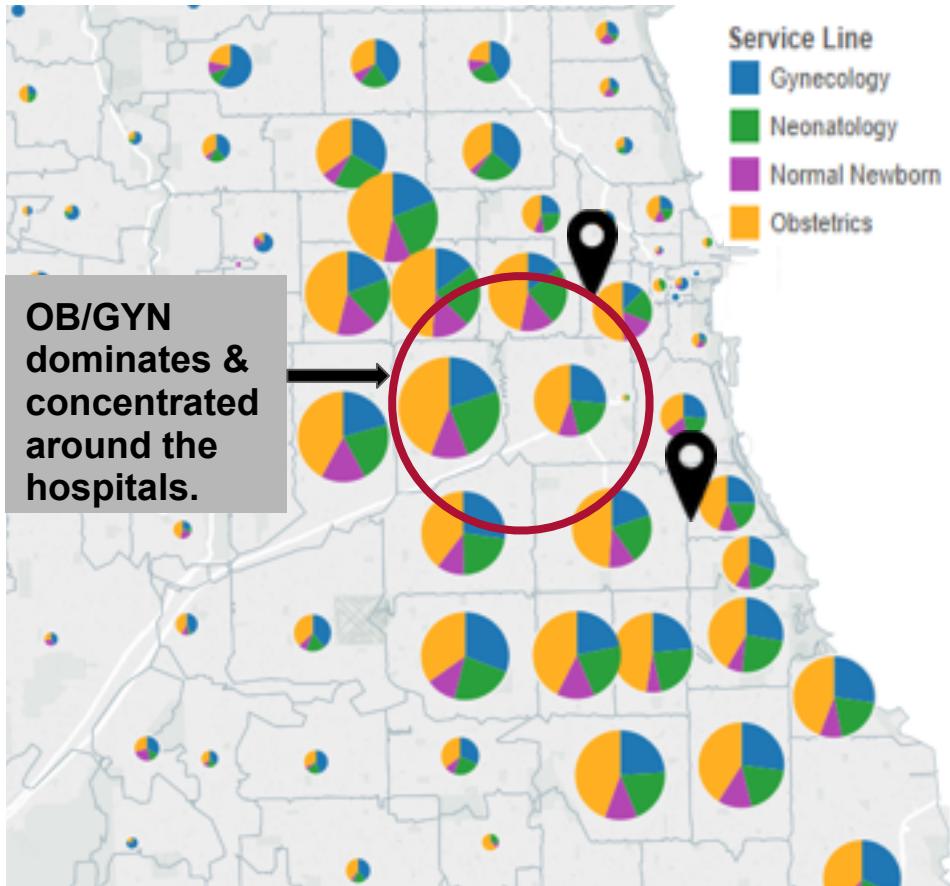


Racial Distribution

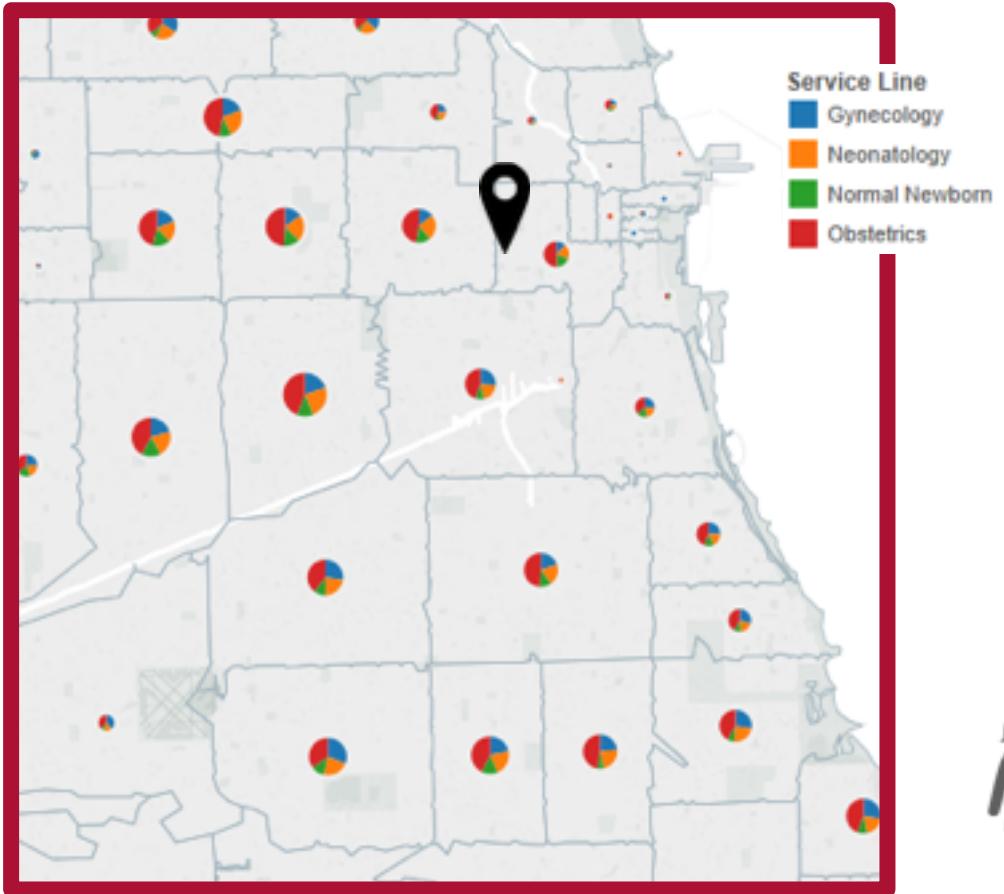
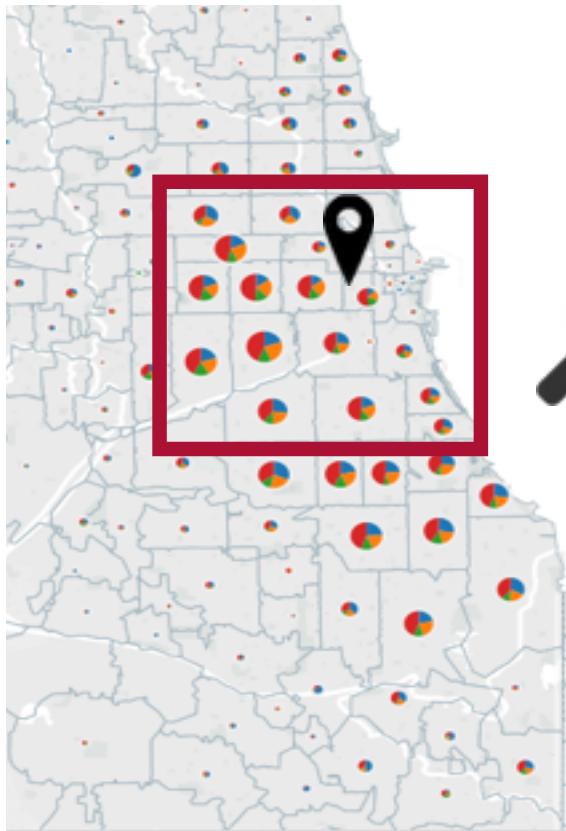
- African American
- Caucasian American
- Native American
- Other
- Asian American
- Native Hawaiian or Pacific Islander



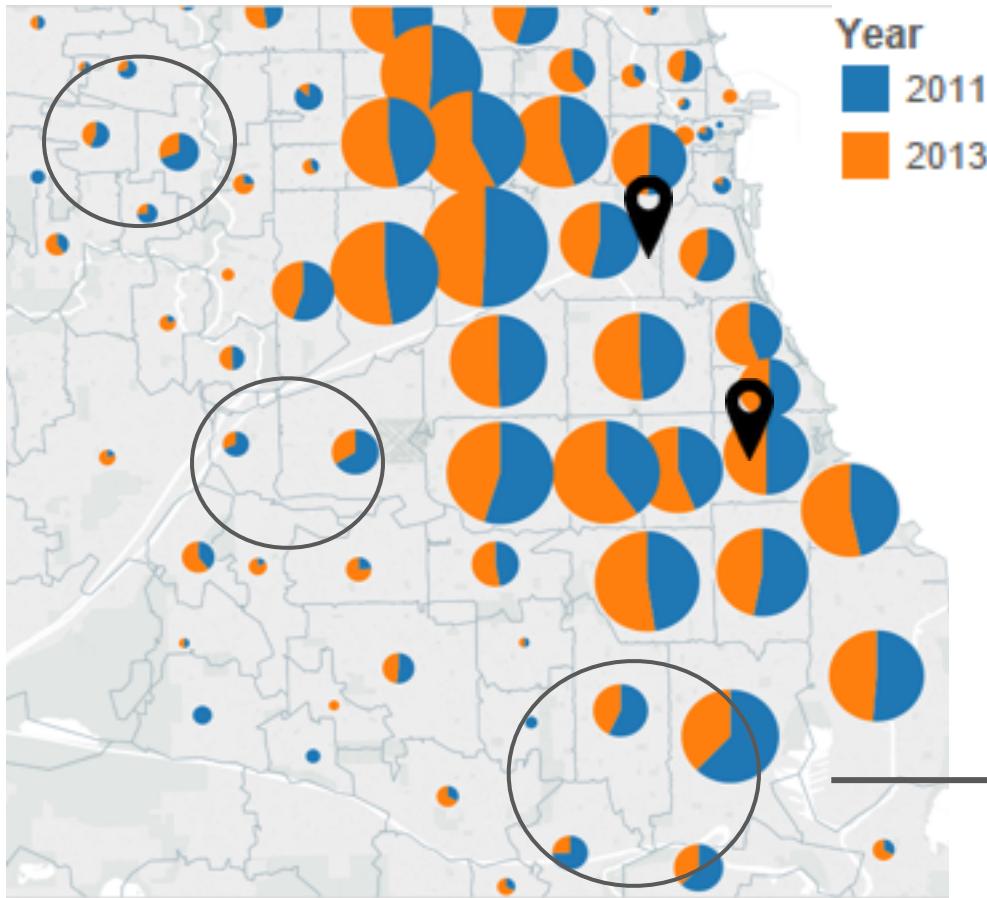
HSA#1- Volume is concentrated around the hospital; % discharges decreased from the far off areas.



HSA#1- OB/GYN dominates in all zipcodes; volume concentrated around the hospital



HSA#1- % of discharges decreased from far of areas between 2011-13



Volume decreased
from far of areas

