



Vermont Health Care Innovation Project

Aaron Truchil & Kelly Craig

January 13, 2015



Camden
Coalition
of Healthcare Providers

***Improving Care
& Reducing Costs
with Hotspotting &
Community-Based
Care Management***

morning session

Agenda

- 1 About the Camden Coalition
- 2 What is hotspotting?
 - .1 Using Data
 - .2 Camden findings
 - .3 Segmentation
 - .3 Hotspotting in Action

*§1 About
the Camden
Coalition
of Healthcare
Providers*



2632
CAMDEN FAMILY
MEDICINE
Dr. Jeffrey C. Brenner, MD
856-41-6800

2632
CAMDEN FAMILY
MEDICINE
Dr. Jeffrey C. Brenner, MD
856-541-6800

Mission:

to **improve the health** of Camden residents by **enhancing the quality, capacity, coordination, efficiency,** and **accessibility** of the city's healthcare delivery system.

Vision:

to be the first city in the country to **bend the healthcare cost curve** while improving quality.

Theory of Change:

CCHP believes that three basic elements are needed to revitalize primary care and improve the healthcare system: **data, engagement,** and **redesign.**

Our Board:

- **Incorporated non-profit**
- **Membership organization**
- **20 member board**



Hospitals



PCPs



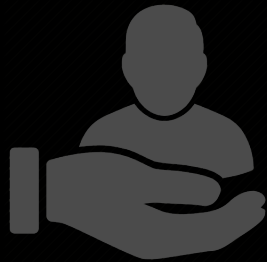
Social Services



Residents

About the Organization:

- 65 staff
- \$5 million annual budget
- Mix of foundation, federal grant funding, and hospital support



**Care
Management
Initiatives**



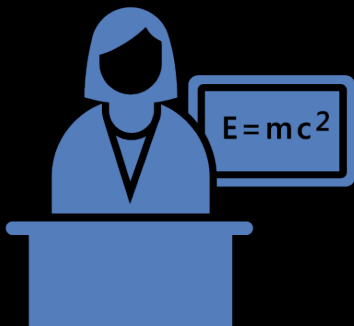
Clinical Redesign



**Legal &
External Affairs**



**Data, Research
& Evaluation**



**Cross-Site
Learning &
Workforce
Development**



**Finance &
Administration**

Providers



Government



Switzerland



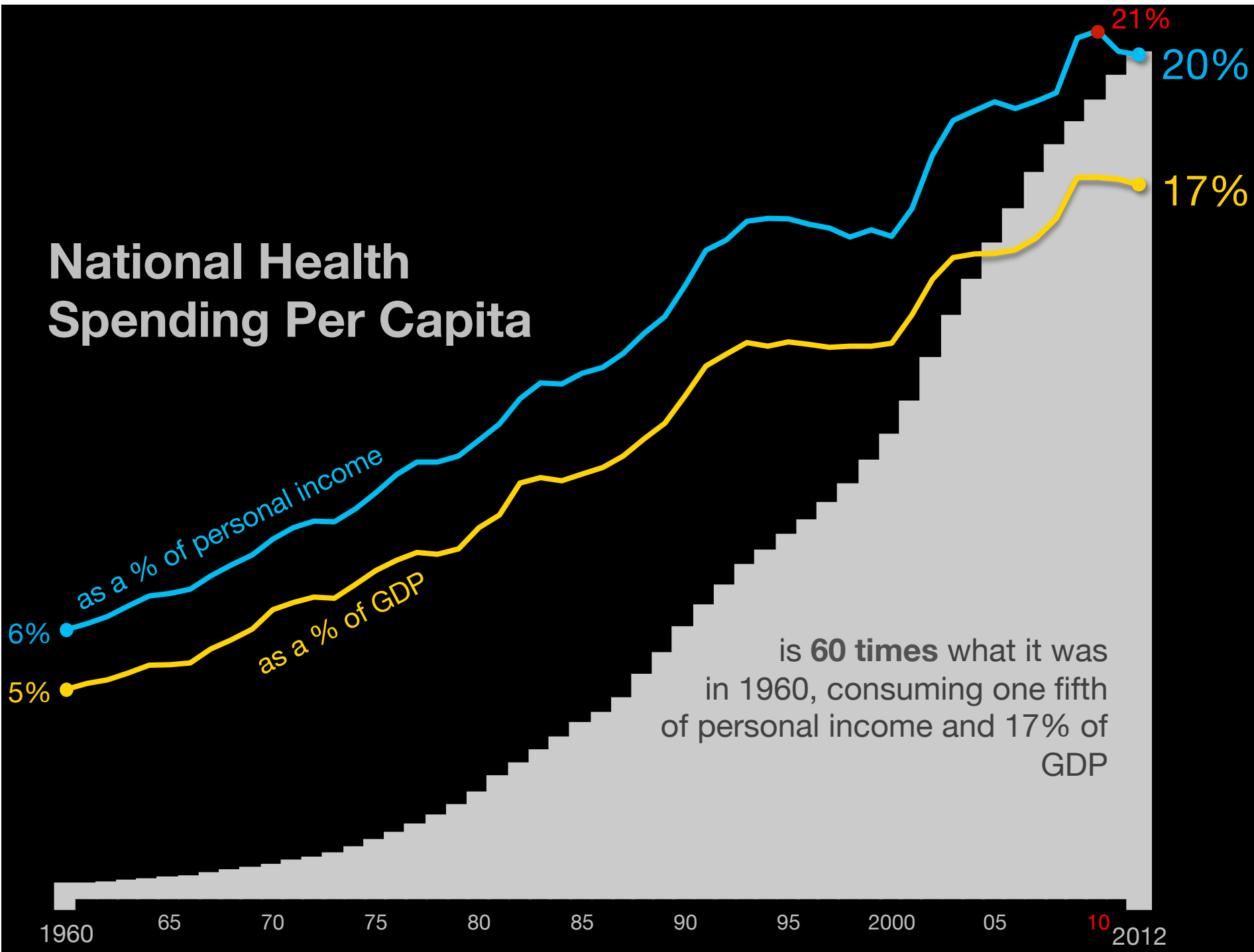
**Residents /
Community**



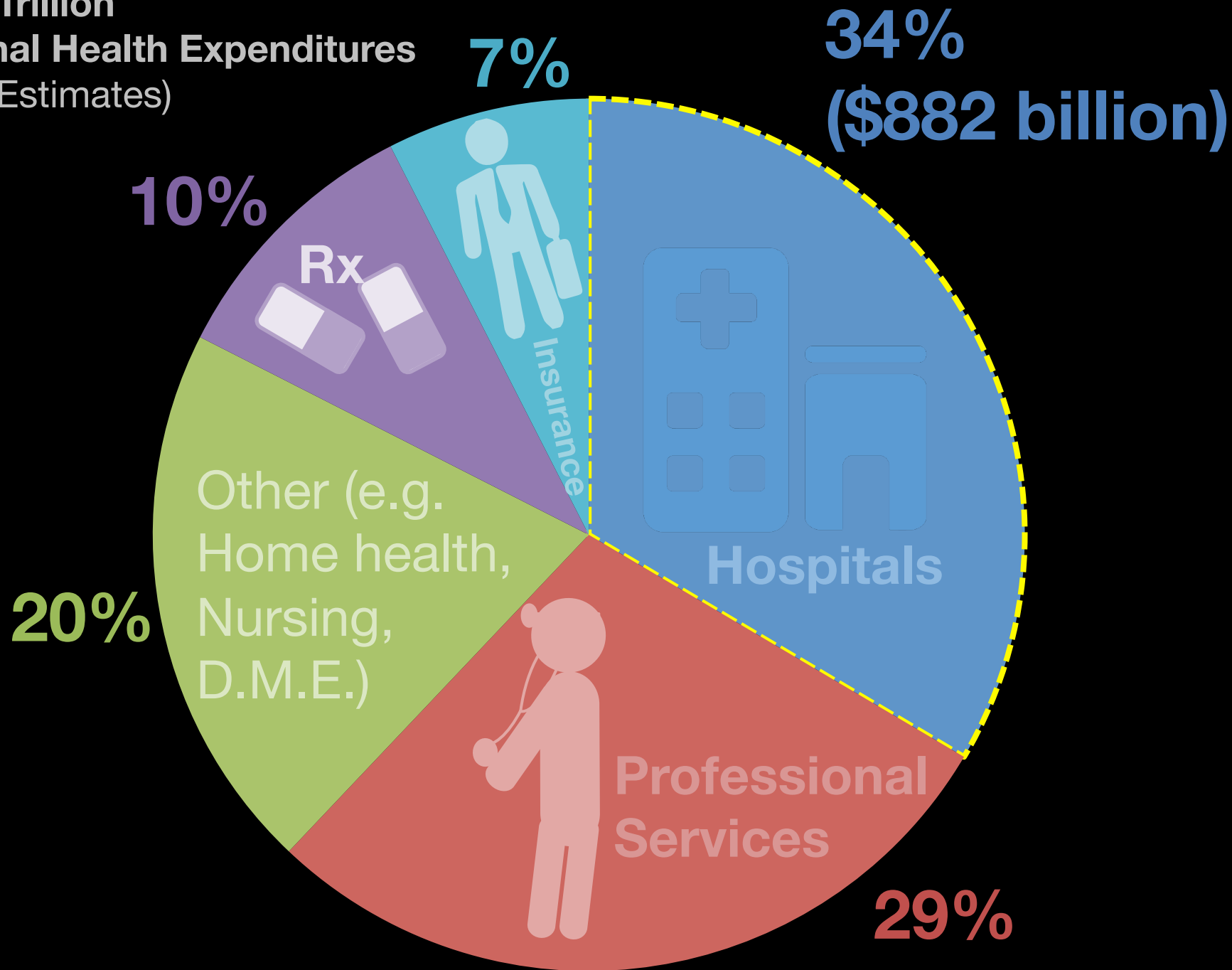
Social Services

**§2 Hotspotting:
the Camden
Coalition's
data strategy**

National Health Spending Per Capita



\$2.63 Trillion
National Health Expenditures
(CMS Estimates)



The *mission* of CCHP
is to improve the health
of all Camden residents
by increasing the
capacity, quality, and accessibility
of the city's healthcare delivery system.

A *core value* of CCHP is to be **data**-driven

Where's the data in the mission?

Hotspotting:

a **data driven** process for the **timely** identification of **extreme patterns** in a **defined region** of the healthcare system

used to guide **targeted** intervention and follow up to better address patient needs, reshape ineffective utilization, and reduce cost.



Building a Citywide, All-Payer, Hospital Claims Database
to Improve Health Care Delivery
in a Low-Income, Urban Community

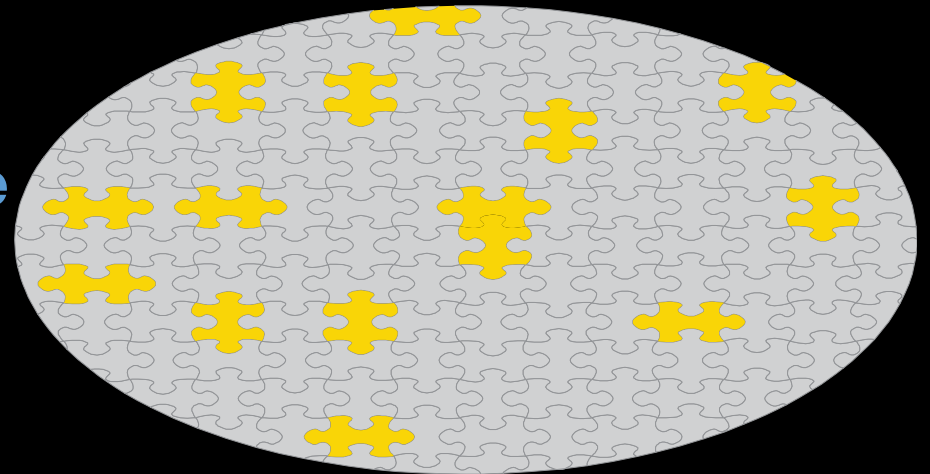
Kennen Gross, PhD, MPH,¹ Jeffrey C. Brenner, MD,¹ Aaron Truchil, MS,¹
Ernest M. Post, MD,² and Amy Henderson Riley, MA, CHES¹

Population Health
Management



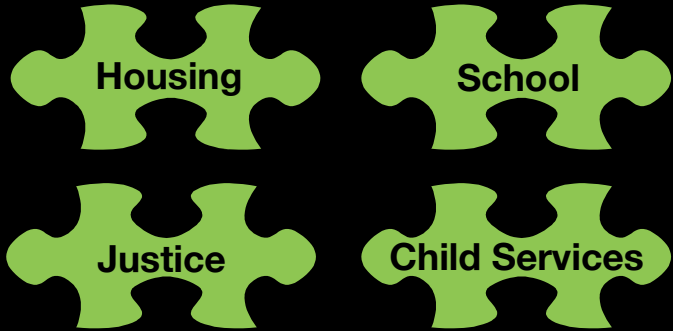
the observed world

**Integrated
Data
Warehouse**

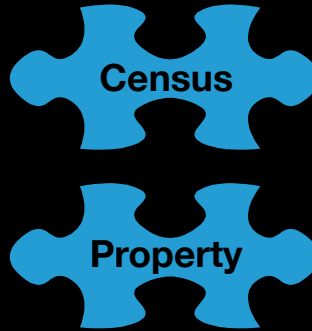


Health Data

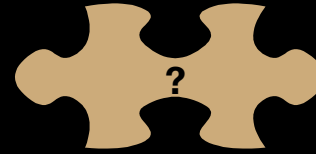
Social Service Data



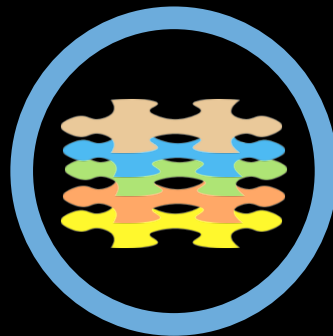
Public Data



Other Data

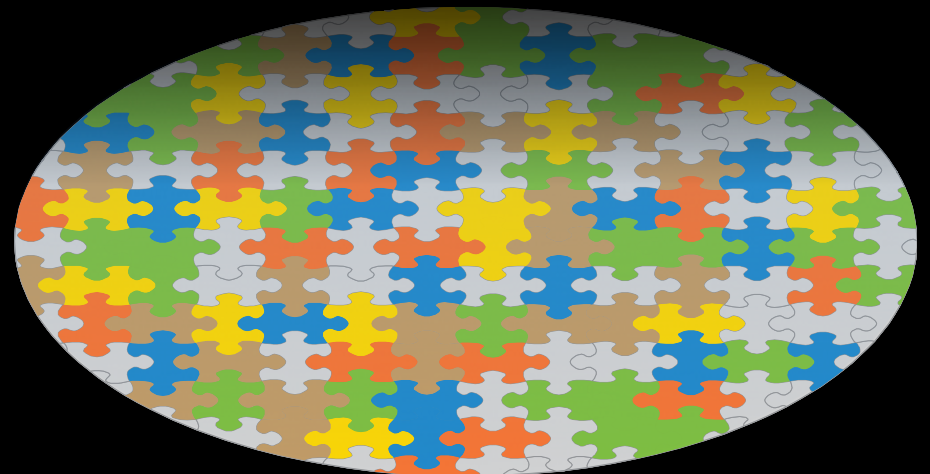


Health Data



Integrated Data Warehouse

the observed world



**§2.1 Camden
findings**



Camden Hospital Utilization

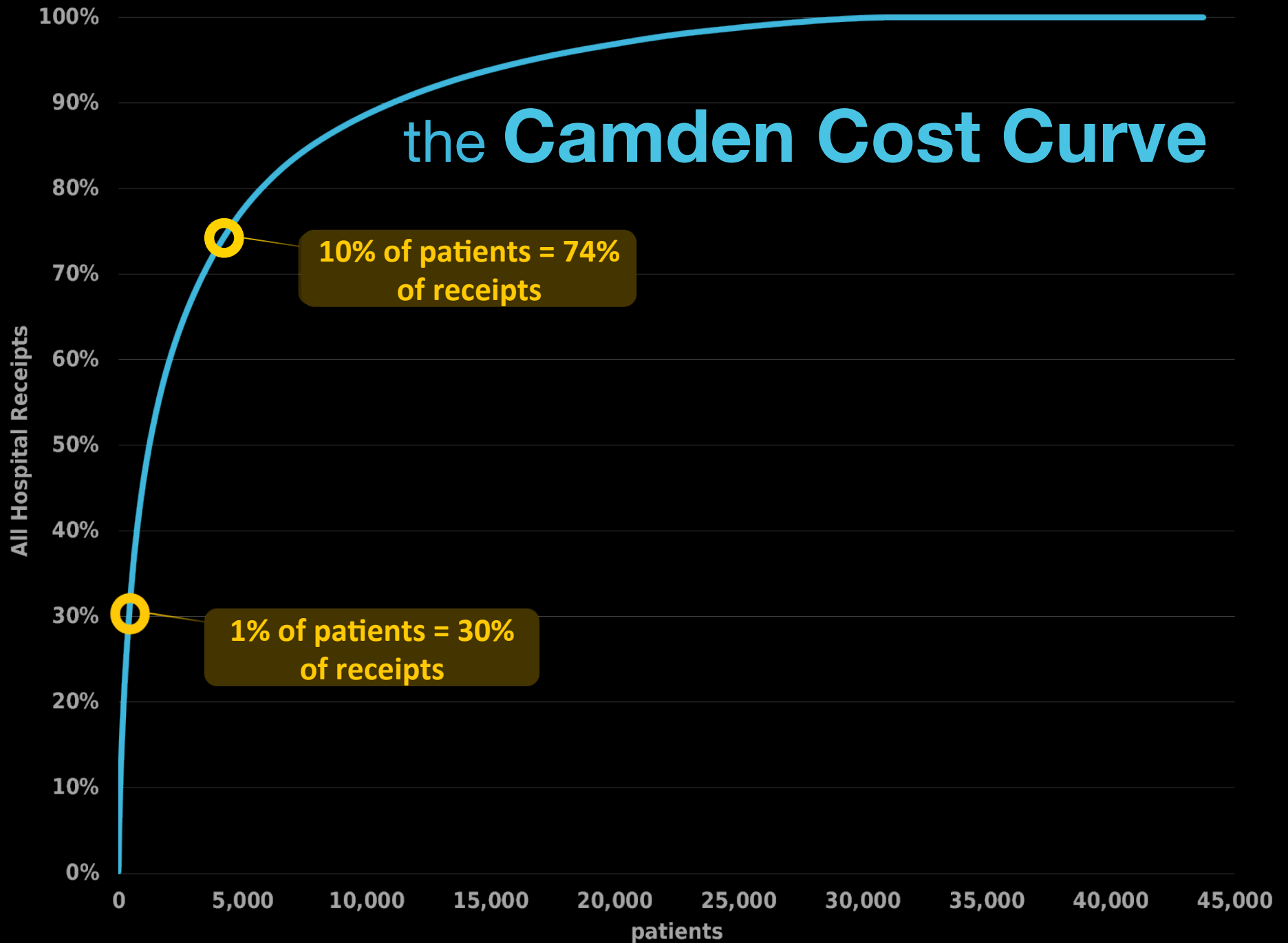
2011 Snapshot

total hospital revenue: **\$108,000,000**

total patients with a hospital visit: **43,710**

patients visiting multiple hospitals: **41%**

the Camden Cost Curve



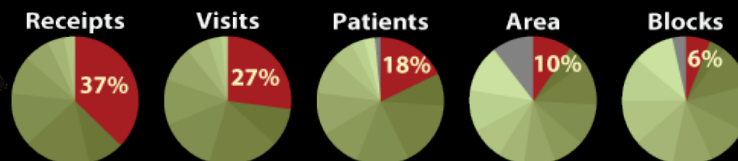
Spatial Analysis of Camden Hospital Costs



Spatial Analysis of Camden Hospital Costs

Several buildings
(e.g.) annually generate
\$1-\$3 *million* in hospital
costs.

6% of city blocks
account for 18% of
patients and 37% of
receipts.



January 2002
– June 2008

Who uses Camden's hospitals most?

top diagnoses

Respiratory Abnormality

Chest Pain

Abdominal Pain

Septicemia

Acute Renal Failure

Urinary Tract Infection

Pneumonia

Chronic Systolic Heart Failure

≈1% of population
>5 chronic conditions

averages:

57 years old

4.5 ED visits

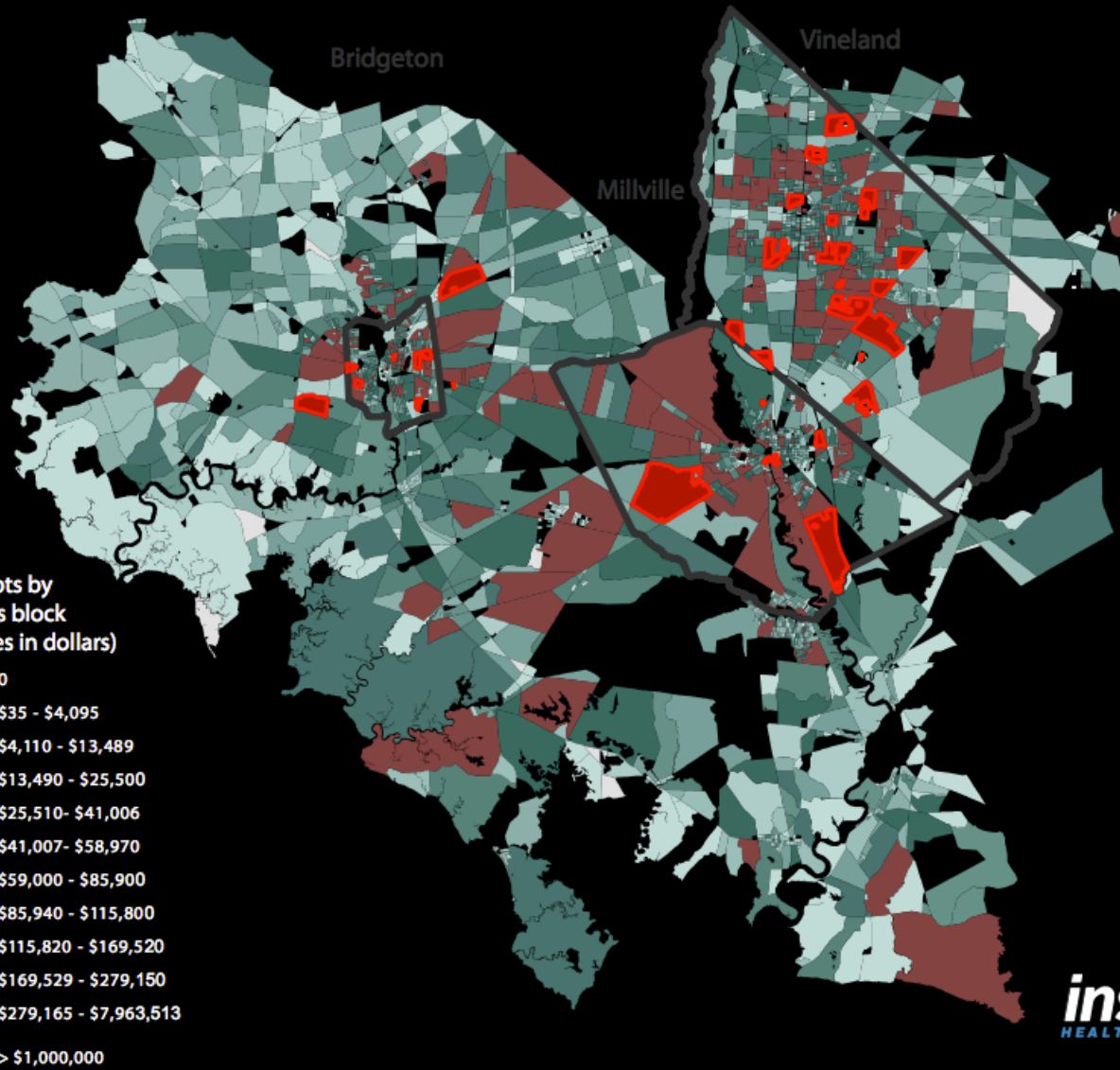
5.3 inpatient

hospitalized 54 days

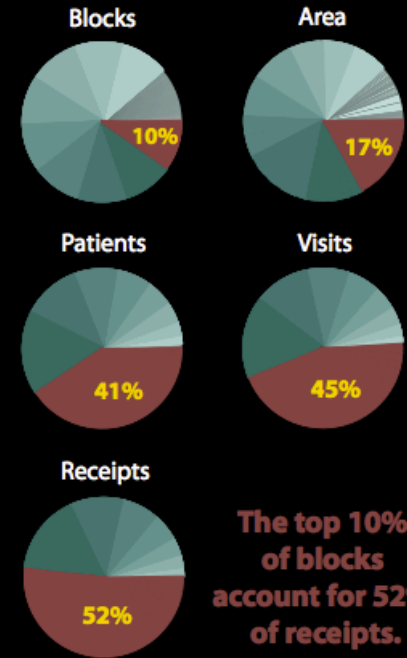
\$673,000 charges

\$73,143 receipts

The Healthy Cumberland ACO Initiative Hotspot Analysis 2012-2013



Overview of High Cost Hotspots



Map includes only blocks with at least 1 visit. Blocks with over 1 million dollars in receipts are included in the red areas of the pie charts.
Source: Inspira Health Network Emergency Department and Inpatient billing data from 2012-2013 and 2010 Census data



NEW JERSEY
HEALTH CARE
QUALITY
INSTITUTE



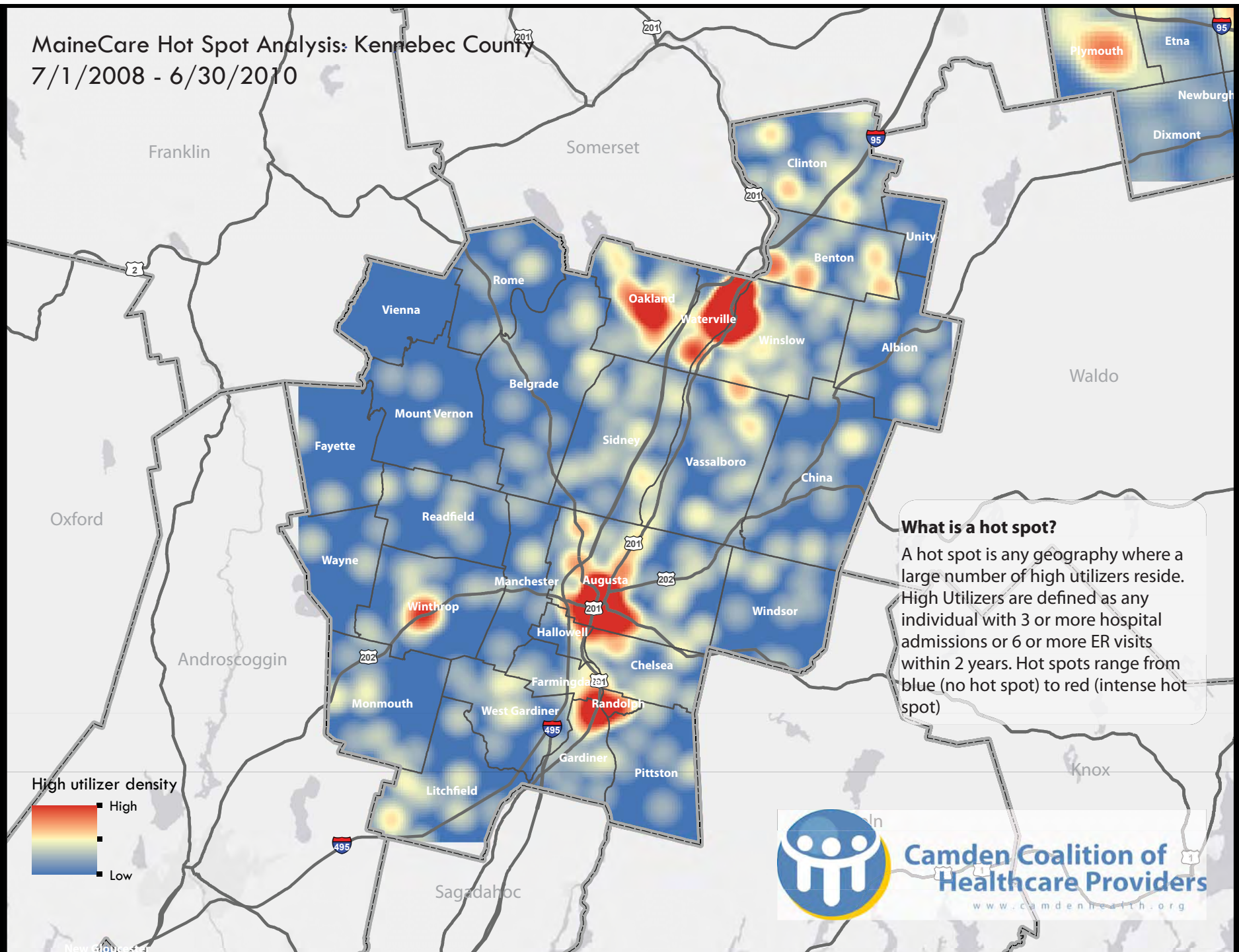
The Nicholson Foundation



Camden
Coalition

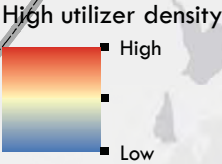
MaineCare Hot Spot Analysis: Kennebec County

7/1/2008 - 6/30/2010



What is a hot spot?

A hot spot is any geography where a large number of high utilizers reside. High Utilizers are defined as any individual with 3 or more hospital admissions or 6 or more ER visits within 2 years. Hot spots range from blue (no hot spot) to red (intense hot spot)



§2.3 *Segmentation*

HERBIVORE

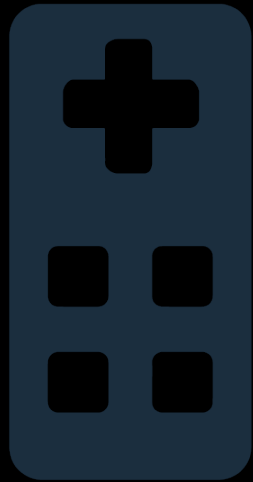
- BAKED EGGS w̄ SPINACH, GOAT'S FETTA, SPANISH ONION, SUN-DRIED TOMATO, PINENUTS & NUTMEG \$13.5
- FITZROY FRESH SANDWICH w̄ AVOCADO, CARROT, SWEET CORNICHONS, ROCKET & HUMMUS \$8-
- BIRCHER MUESLI w̄ MIXED BERRY COMPOTE, VANILLA YOGHURT, ALMONDS & GOJI BERRIES \$7.5
- SHMUSHED AVOCADO ON ORGANIC MULTISEED SOURDOUGH w̄ ARTICHOKE HEARTS, GOAT'S FETTA & LEMON \$8.5

CARNIVORE

- BAKED EGGS w̄ SMOKED SALMON, CARAMELIZED ONIONS, SPINACH, TOMATO & LIGHT DILL & SPRING ONION CREAM CHEESE \$14.5
- CROQUE-MONSIEUR w̄ HAM, EXTRA SHARP VINTAGE CHEDDAR & BECHAMEL SAUCE \$9-



Healthcare *Does* Segment



healthy

Longevity, by preventing accidents, illness, and progression of early stages of disease



Physicians' offices, health clinics, occupational health

maternal / infant

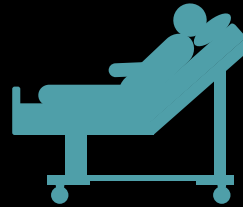
Healthy babies, low maternal risk



Prenatal services, delivery, and perinatal care

**acutely ill
(likely recovery)**

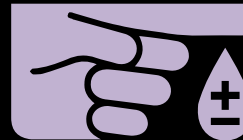
Return to healthy state with minimal suffering and disruption



Emergency services, hospitals, physicians' offices, medications, short-term rehab services

chronic conditions

Longevity-limiting disease progression, accommodating environment



Self-management, physicians' offices, hospitalizations and ER visits

long decline

Support for caregivers, maintaining function, skin integrity, mobility, advance planning



Home-based services, mobility and care devices, family caregiver training and support

**maternal /
infant**

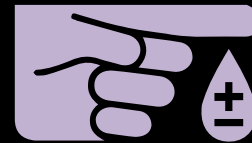
healthy babies,
low maternal
risk



prenatal
services,
delivery, and
perinatal care

**chronic
conditions**

longevity- limiting
disease
progression,
accommodating
environment



self-
management,
physicians'
offices,
hospitalization
& ER visits

**maternal w/
chronic
conditions**



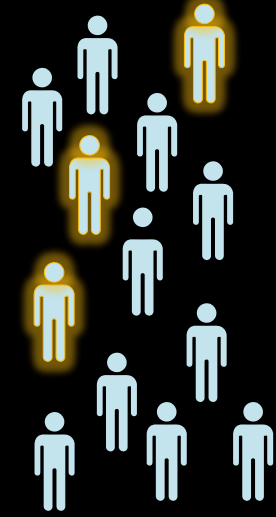
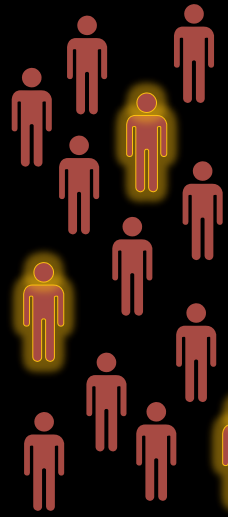
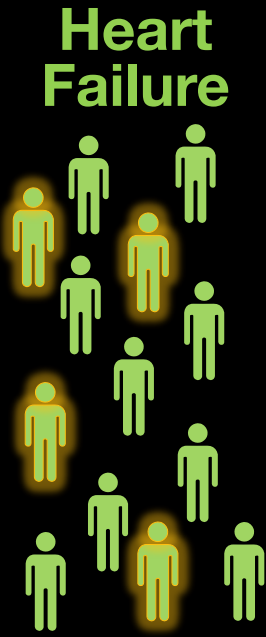
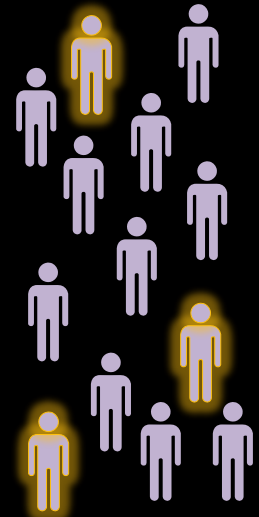
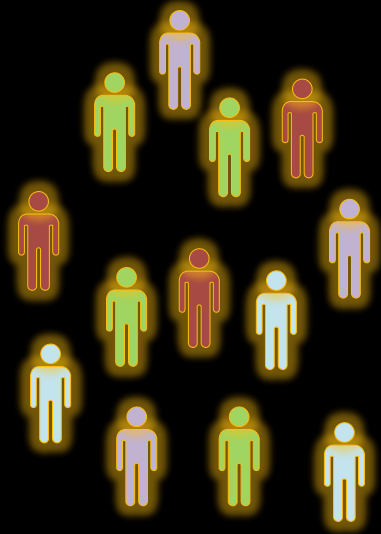


Intervention Paradigms

Hotspotting

Traditional Medical

Complex



Diabetes

Heart Failure

COPD

ESRD

Patient "Typology", 2011

X patients

\$ charges

\$ receipts

inpatient visits

0

1

2-3

4 +

emergency visits

0

1-2

3-5

6+

2,900 6.6%
\$132m 14.8%
\$16m 14.7%

26,819 61.0%
\$87m 9.9%
\$11m 10.6%

2,332 5.3%
\$115m 13.0%
\$14m 12.9%

9,010 20.6%
\$298m 33.6%
\$37m 33.8%

2,293 5.2%
\$90m 10.2%
\$10m 9.4%

355 .8%
\$165m 18.6%
\$20m 18.6%

High Cost

4 ED
3 INP
\$400k
3 Chronic
55 y.o.

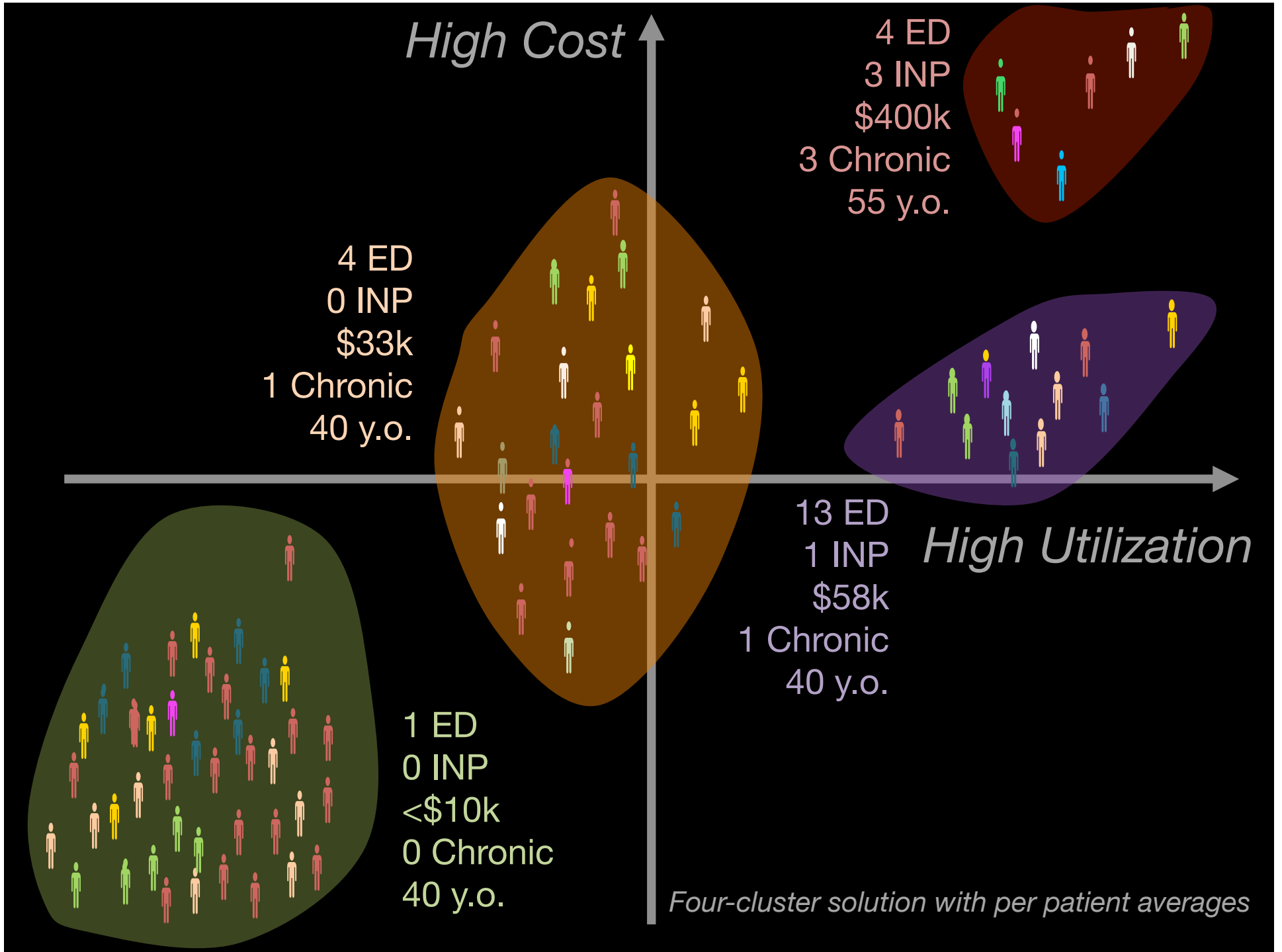
4 ED
0 INP
\$33k
1 Chronic
40 y.o.

High Utilization

13 ED
1 INP
\$58k
1 Chronic
40 y.o.

1 ED
0 INP
<\$10k
0 Chronic
40 y.o.

Four-cluster solution with per patient averages



Patient Diagnosis Profiles

Use/Cost Cluster	patient share	Top primary diagnoses
One-Time ED/Low Average Cost Population	68%	Abdominal pain Back problem Upper respiratory infection Arthritis/other non-traumatic joint disorder Sprain/Strain
Low Inpatient/Medium ED Utilizing/Medium Cost Population	27%	Abdominal pain Back problem Upper respiratory infection Staph/other skin or tissue infection Arthritis/other non-traumatic joint disorder
High ED Utilizing/High Cost Population	3%	Asthma Abdominal pain Back problem Arthritis/other non-traumatic joint disorder Upper respiratory infection
High Inpatient Utilization/High Cost Population	2%	COPD Congestive heart failure Diabetes Abdominal pain Asthma

Why We Don't Predict: (now, or maybe ever)

Present: known but misunderstood. Future: changing.

Wrong time horizon for savings & quality improvement

Existing models don't work well

More resources to reach fewer patients

**§3 *Hotspotting
in Action***



The Problem

HIGHER
Social Complexity
LOWER



- 23 Y.O. Male
- Hx of Type 1 Diabetes
- Lives with Grandmother
- Works as Day Laborer
- Learning Disability

- 52 Y.O. Male
- Hep C, CHF, HTN
- Homeless
- Uninsured
- Active substance use
- No income
- No Social Support

- 67 Y.O. Female
- Hx CHF, HTN, COPD
- Depression, Anxiety
- 17 Meds Daily
- Work History
- D/C To LTAC
- Daughter Is Primary Caregiver

LOWER Medical Complexity HIGHER

Variation of Patient Complexity

Uncoordinated Patient Care



Clinical Interventions

PUSH

upstream workflows
for *hospital*-based
enrollment and initial
care planning

CARRY

centralized
community-based,
patient-centric
activities

CATCH

refocused efforts to
redesign primary care
around *PCP*-based
ACO activation

Admitted Past Month (High Use)

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Reports

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Facility: Any Unit: Any Provider: Any

Displaying 170 results

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Name	DOB	Age	Gender	Admit Date	Discharge Date (Day)	Facility	Total Days (6mo)	Inp (6mo)	ED (6mo)	Provider	Practice	Insurance	Adm Diagnoses
		50	M		(Day 2)	CUH	30	3	4				
		VO											
		56	F		(Day 1)	CUH	8	4	5				
		VO											
		80	F		(Day 1)	CUH	8	3	1				
		VO											
		92	M		(Day 1)	LGA	7	3	3				
		VO											
		53	F		(Day 1)	CUH	4	3	2				
		VO											
		36	F		(Day 1)	VIRTUA	40	11	3				
		VO											
		65	M		(Day 1)	CUH	26	3	1				
		VO											
		48	F		(Day 3)	CUH	17	3	0				
		VO											
		52	M		(Day 2)	CUH	5	4	1				
		VO											
		61	M		(Day 3)	CUH	15	5	1				

[Show Query Definition](#)

Daily Data Feeds



Triage



Bedside Engagement



Patient Relations
One Cooper Plaza, Pavilion 10B
Camden, NJ 08103
patient-relations@cooperhealth.edu
Ph. 856.342.2432 • Fax 856.361.1319

Health
Care
Transportation

Questions for My Care Team...

- Birth certificate
 - Social Security card
 - Non-drivers N.J. I.D.
 - * Housing ***
 - * Schooling
 - * employment
 - Addictions Support
 - Medication Support
 - Transportation
 - Phone Communication
 - Clothing
 - Food - Welfare?
- Primary Care Physician
Protect Hope Subs

Initial Bedside Care Planning



Home Visits



AFTER

Home-based Medication Reconciliation



Accompaniment



Graduation



It Takes a Team

Breakout I