ARRAY

The New Normal: COVID-19 Solutions for the Present and Future

05.14.20

ARRAY
advisors

We are strategy.

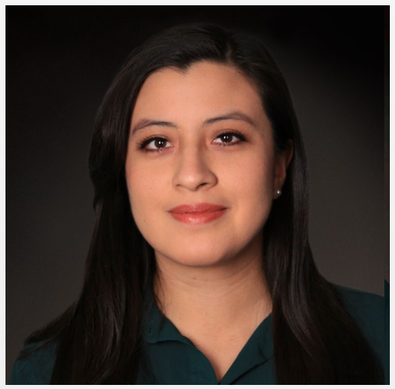
ARRAY
architects

We are design.

ARRAY
analytics

We are technology.

Craig Meaney
Moderator



Catherine Castillo
Strategic Planner

Lisa Lipschutz
Practice Leader
Planning

Fady Barmada
President,
Chief Strategy Officer

Neil Carpenter
Vice President,
Strategic Planning

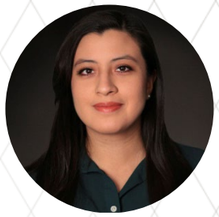
OBJECTIVE

Explore strategies and design solutions that can position health leaders for success in managing COVID-19.

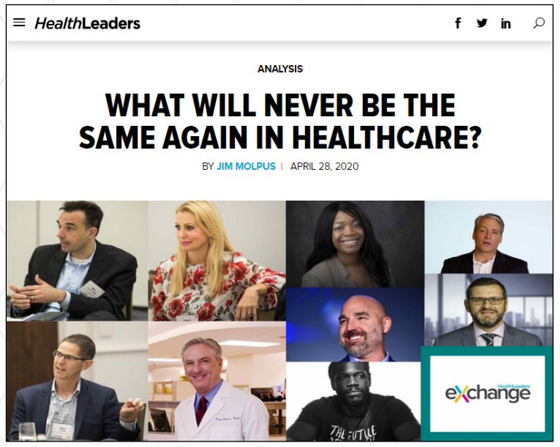
TOPICS

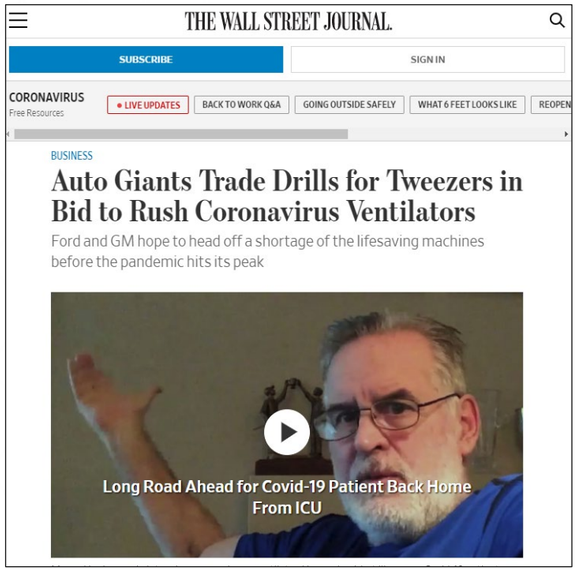
1. Discover new ways health systems are overcoming COVID-19 challenges and preparing for a second wave
2. Gain actionable strategies for managing COVID-19 patients today
3. Identify considerations for resuming outpatient care
4. Learn key policy, strategy and demand considerations for preparing for a Post COVID-19 Healthcare reality

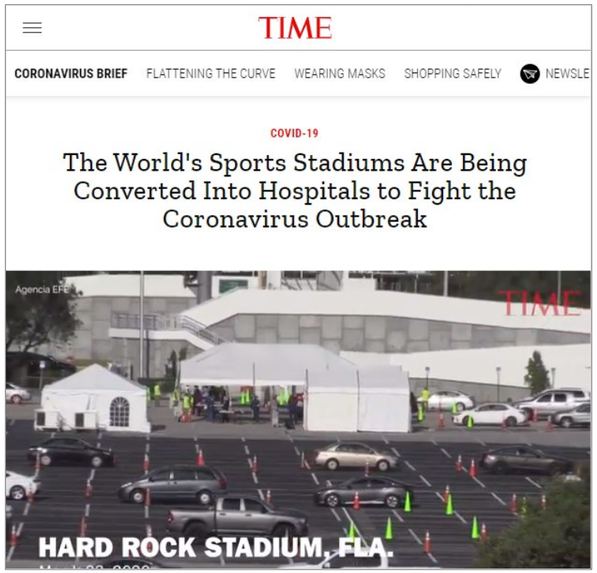
Publications Covering Array's COVID-19 Resources

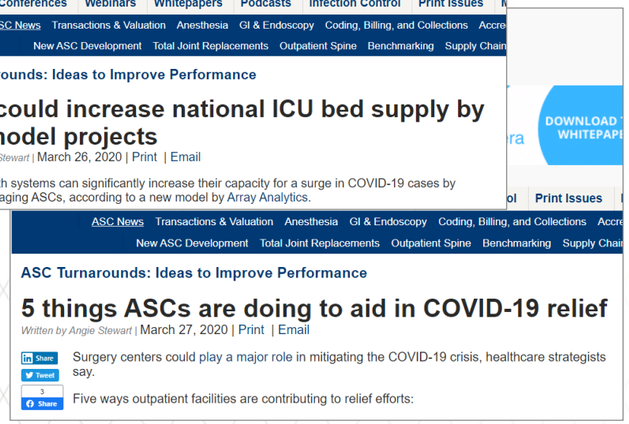


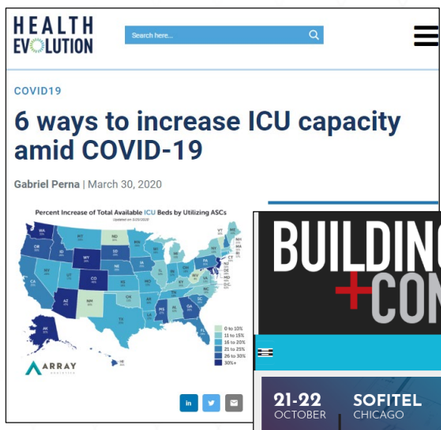
CATHERINE





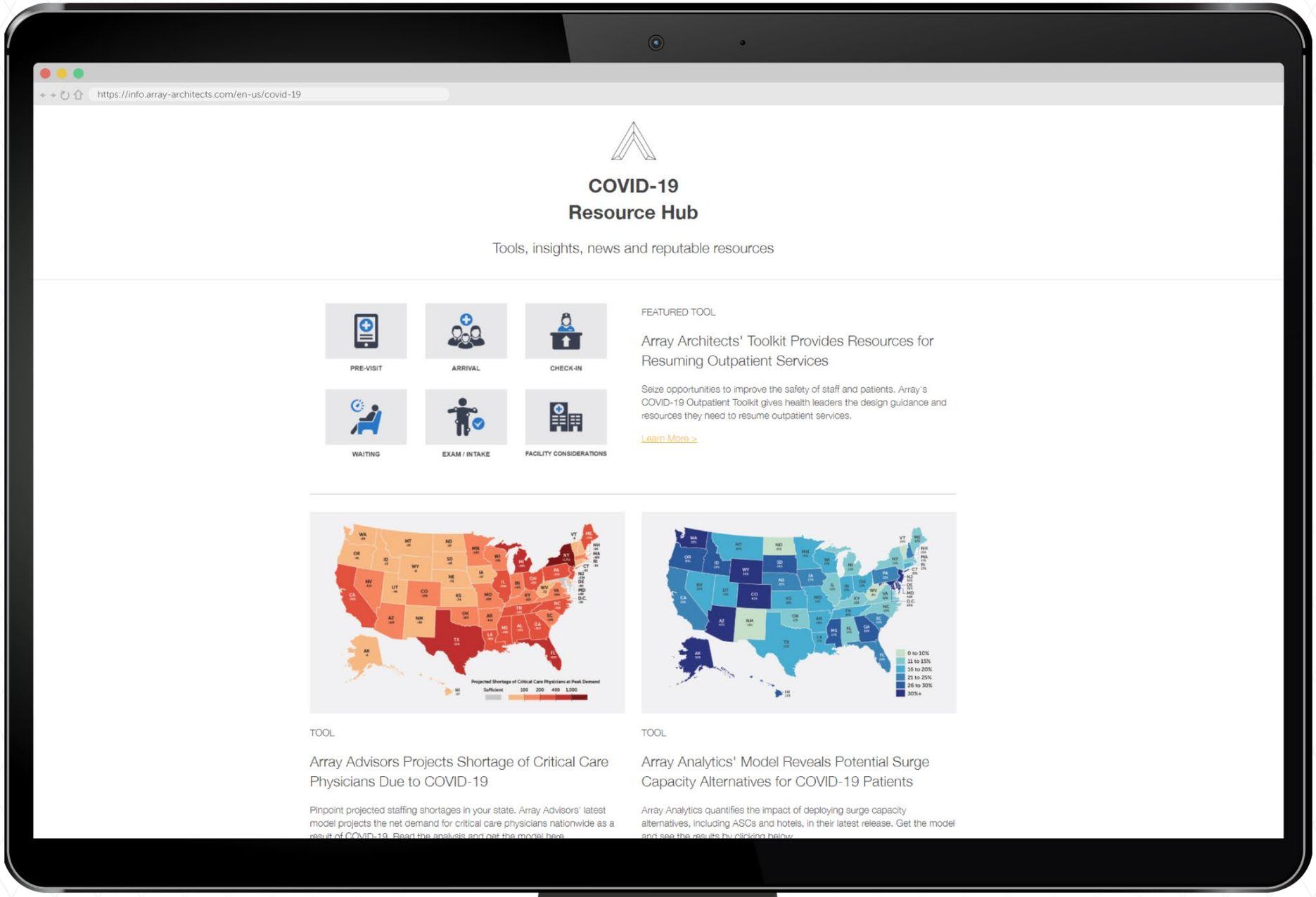






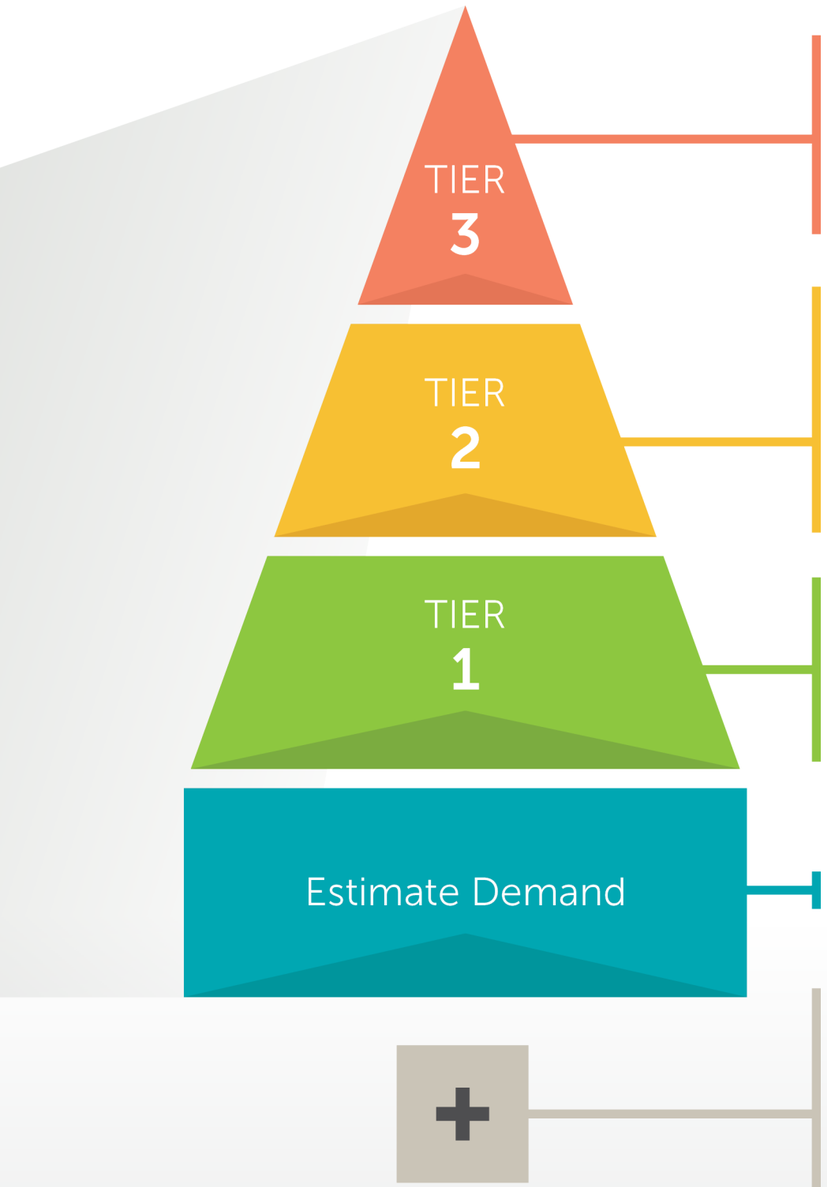
COVID-19 Resource Hub

CATHERINE



Surge Capacity Assessment & Expansion Plan Tool

CATHERINE



Review capacity of facility assets:

- ☐ Relocate hospital based surgical and post surgical services to an aligned ambulatory surgery center in your network (or ask your state's Governor to seize the nearest ASC to enable this)
- ☐ Create OB delivery space outside of hospital (e.g. MOB or temporary space adjacent to ASCs)
- ☐ Convert ORs to additional ICUs

- ☐ Enable Full Capacity Protocol - e.g. place additional beds in patient care units (alcoves, conference rooms, corridors)
- ☐ Determine feasibility of converting modern private rooms to double-occupancy
- ☐ Assess capacity of prep/recovery spaces and alternate surgical recovery operational plans
- ☐ Redirect HOPD surgical cases to ASCs

- ☐ Define elective surgeries and cancel those cases
- ☐ Determine ability to convert former semi-private rooms back to double-occupancy
- ☐ Identify ASC/Endo centers in your region to potentially leverage for capacity
- ☐ Identify strategies for patient segregation and isolation as volumes scale
- ☐ Review mass triage approach plan and flow

- ☐ Estimate additional ICU/Med Surg capacity required

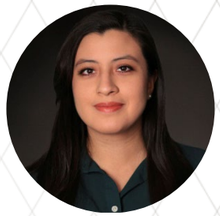
Review capacity of support functions:

- ☐ EMR Documentation support for surge patients
- ☐ PPE carts for surge patient locations
- ☐ Patient call system approach for surge patients
- ☐ Negative air pressure conversions to increase capacity
- ☐ Identify portable physiological monitoring capacity

REQUIRED RESOURCES:

- Bed supply in your local market
- Access to current volumes and utilization data
- Support of planning and facilities staff
- Targeted visual assessment of hospital spaces
- Life Safety drawings of campus with room names
- Operational bed counts by type and licensed bed counts
- List of ambulatory facilities

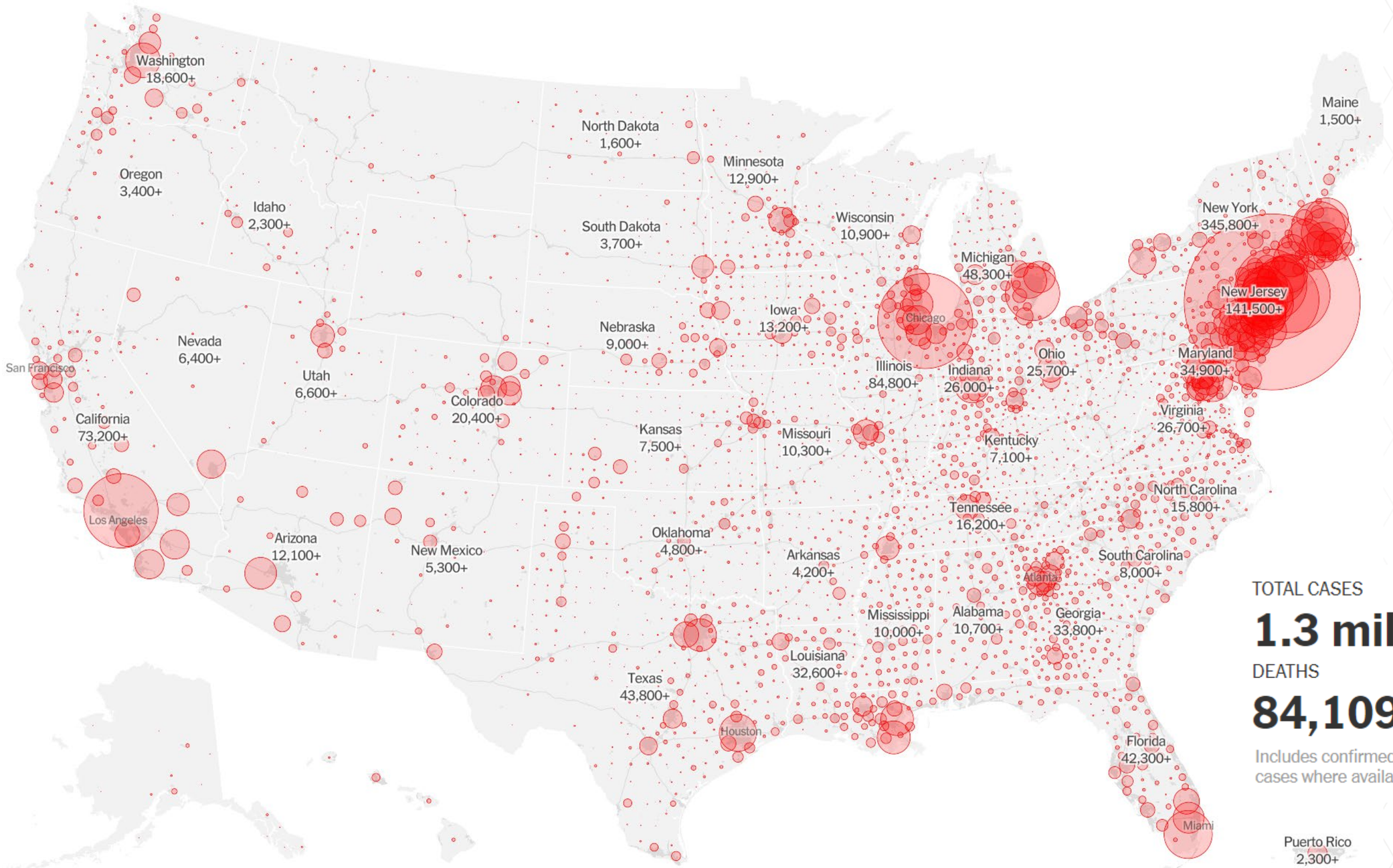
ARRAY
advisors



CATHERINE

COVID-19 Cases in the U.S.: Latest Case Count

Last Update: 5/14/2020 at 7:50AM



TOTAL CASES

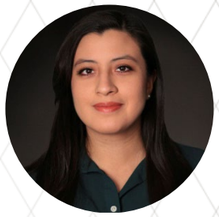
1.3 million+

DEATHS

84,109

Includes confirmed and probable cases where available

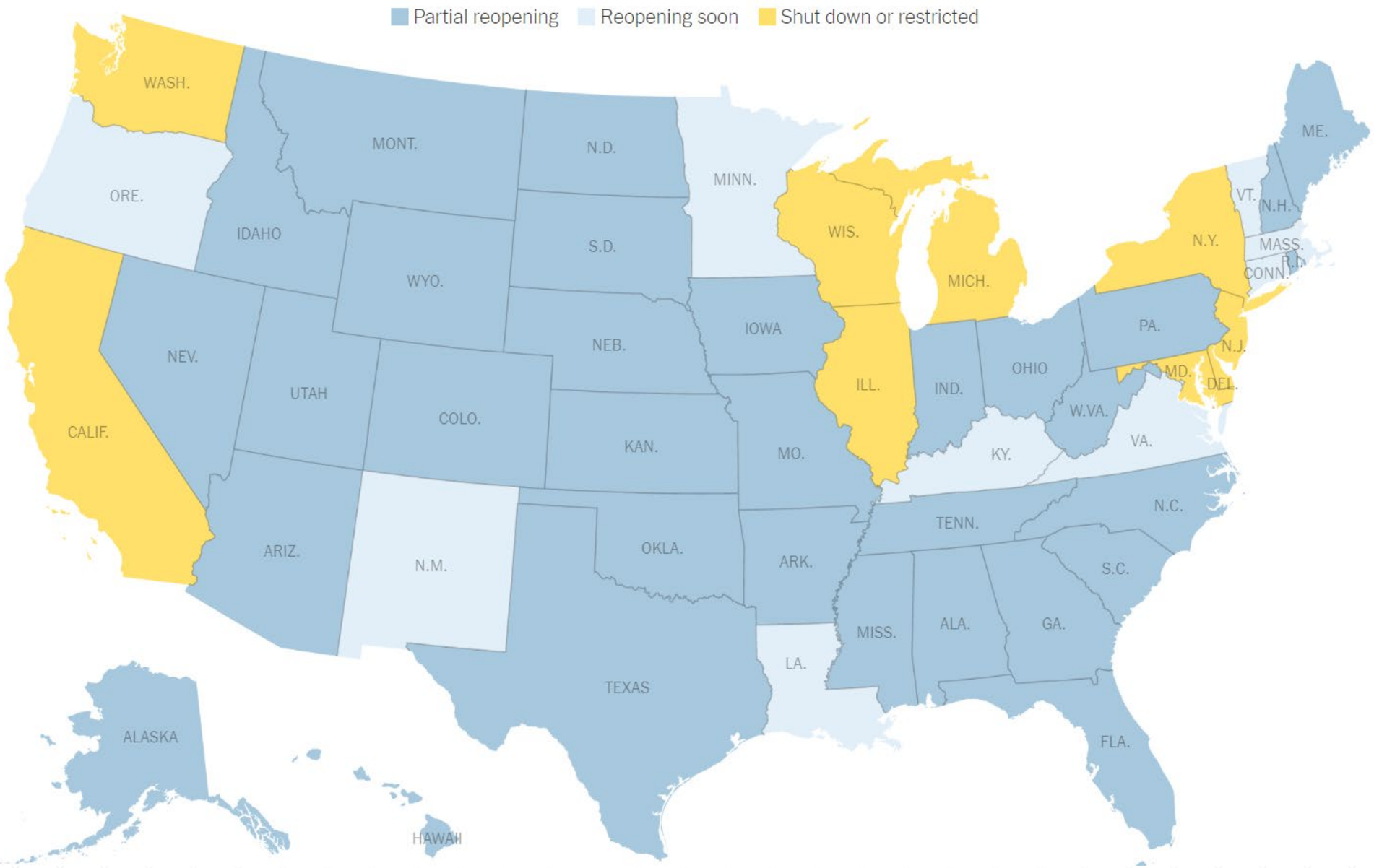
SOURCE: New York Times. https://www.nytimes.com/interactive/2020/us/coronavirus-us-cases.html



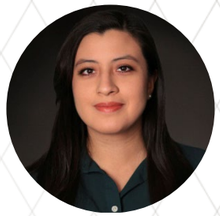
CATHERINE

States Have Started to Reopen...

Last Update: 5/13/2020



SOURCE: New York Times. https://www.nytimes.com/interactive/2020/us/states-reopen-map-coronavirus.html



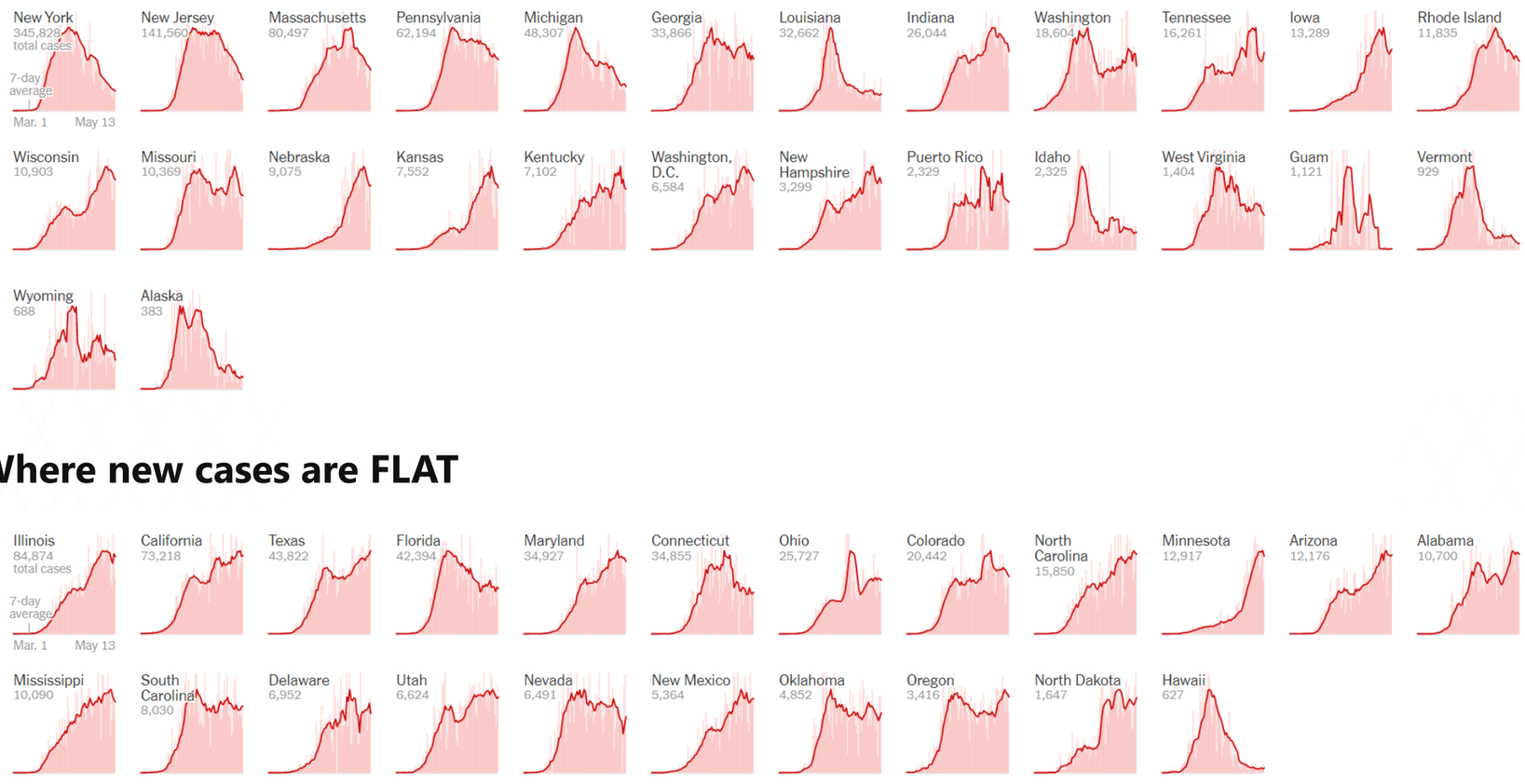
CATHERINE

...But Have We Flattened the Curve?

Last Update: 5/12/2020 at 10:00 AM

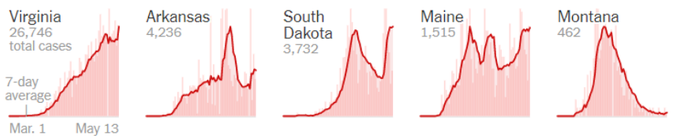
Based on the most recent week of data...

Where new cases are DECREASING



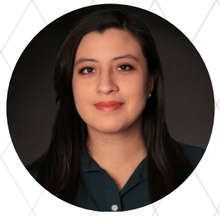
Where new cases are FLAT

Where new cases are INCREASING



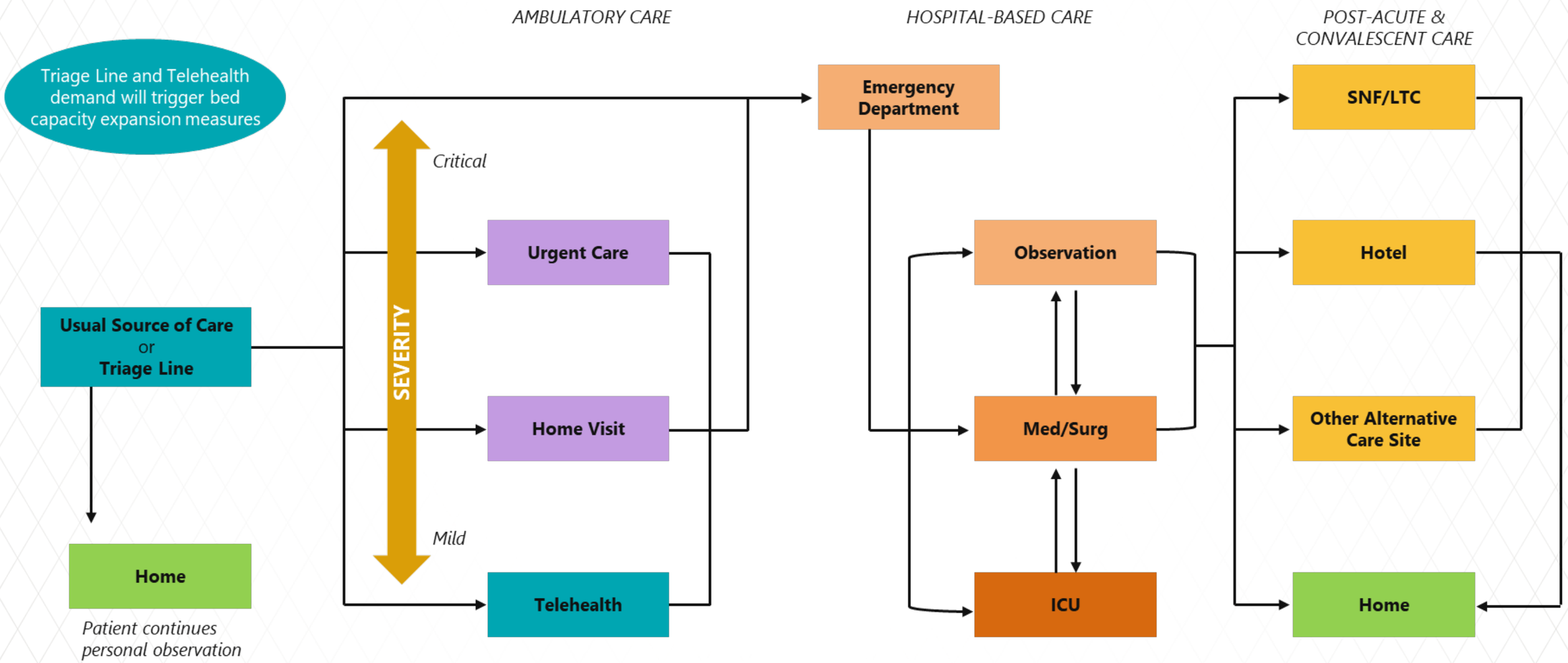
SOURCE: New York Times. https://www.nytimes.com/interactive/2020/us/coronavirus-us-cases.html

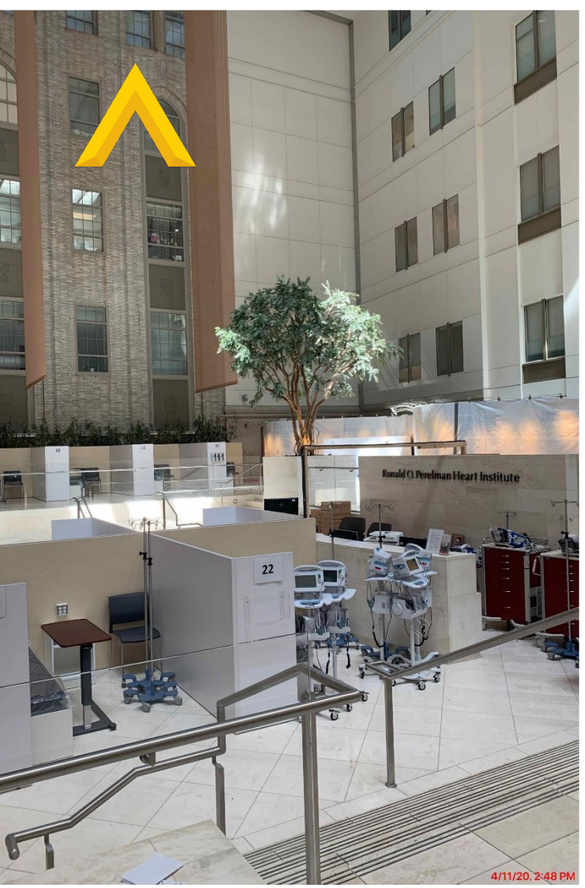
COVID-19 Patients Must Be Managed Across the Continuum of Care



CATHERINE

SAMPLE COVID-19 CARE MODEL

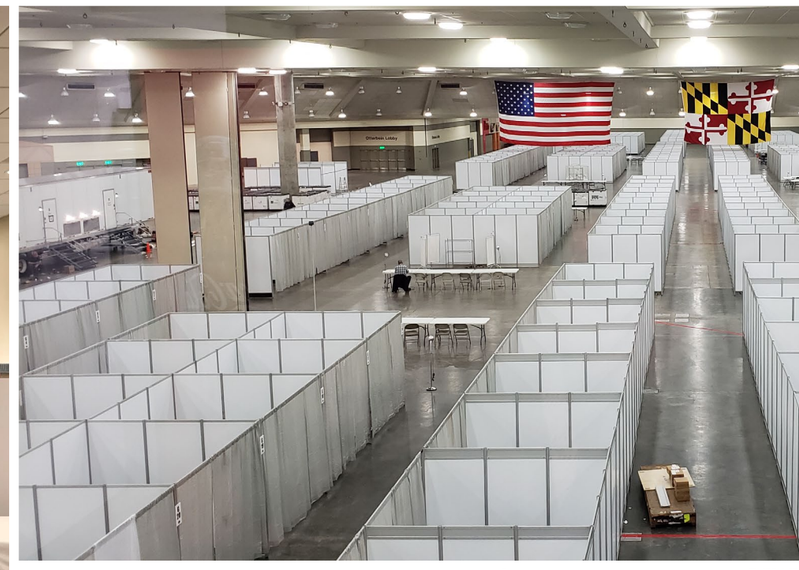


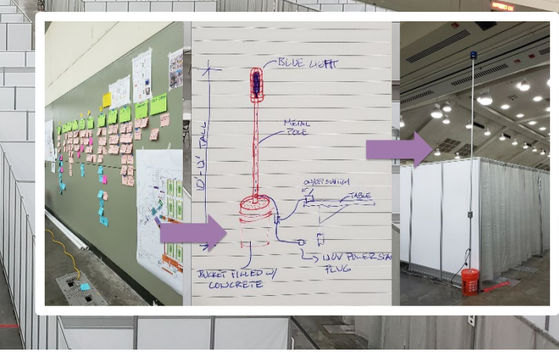

Ronald O. Perelman Heart Institute
22
4/11/20, 2:48 PM

MYRNA L. DANIELS AUDITORIUM

CATHERINE
Otterbein Lobby

RESPECT OUR FACILITIES DON'T DAMAGE
RESPECT OUR FACILITIES DON'T DAMAGE




Patients arrive in medical transport from a hospital via the Conway Street drive
Morgue Truck
Red Bag Waste
Sealed Exit
Cart Disinfecting Area
Patient Entry/Exit
Oxygen Storage
Pharmacy
Clean Supply
Unboxing Area
Equip Storage
Patient Showers
Triage & Intake
MISSION CONTROL
Administration & Staff Support
Nurse
A
B
C
D
E
F
G
H
1 Patient Pod Opening Phase 1
2 Patient Pod Opening Phase 2
3 Patient Pod Opening Phase 3
HOWARD STREET
Patient Acuity
HIGH
LOW
COLD ZONE
HOT ZONE
Staff Dining
Staff Doffing
Staff Showers
Patient Respite
Staff Lockers

SUNRISE
SENIOR LIVING
BETHESDA
4925
Assisted Living
With a Special Neighborhood

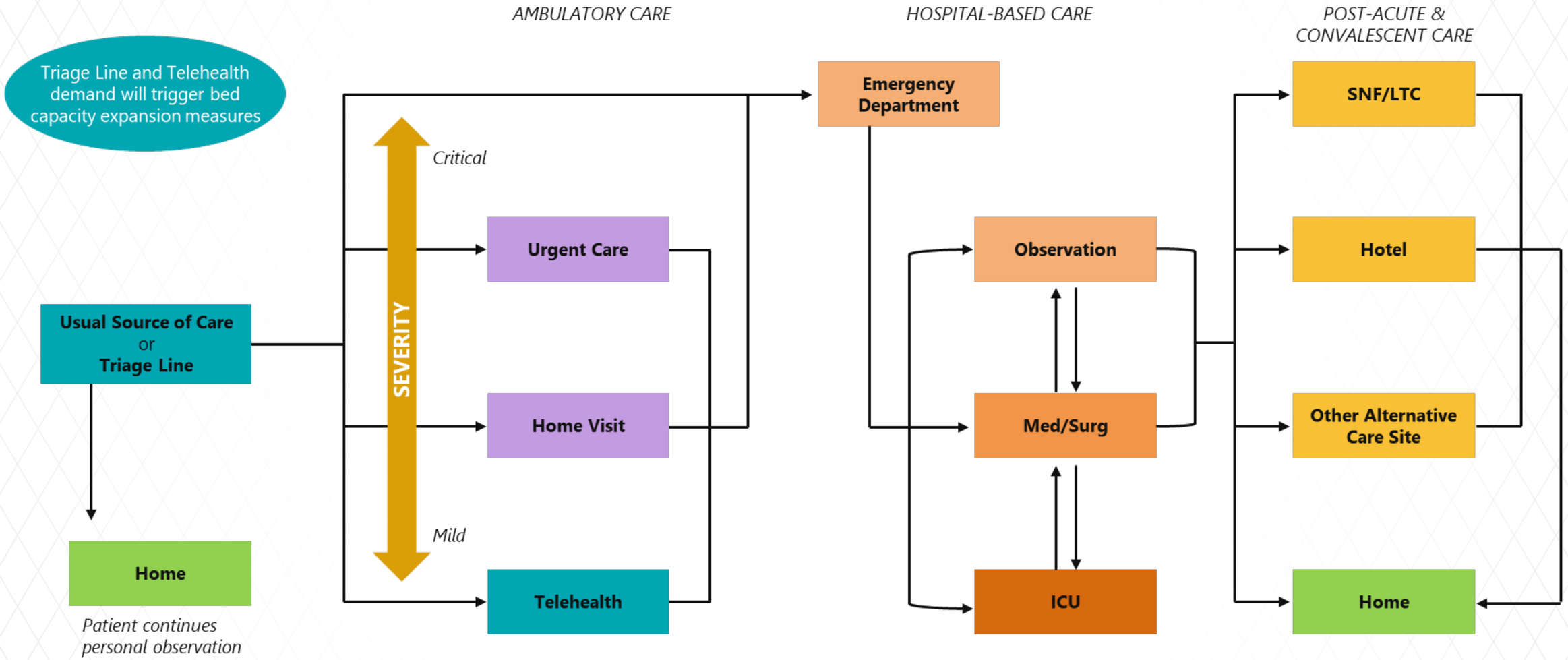
NEIL

HEROES WEAR
ORANGE
THANK YOU SUNRISE HEROES!

COVID-19 Patients Must Be Managed Across the Continuum of Care

NEIL

SAMPLE COVID-19 CARE MODEL



But how can we be proactive to avoid positive cases? And for whom?

State Population Breakdown

NEIL

6,000,000

Total residents

2,600,000

On Medicare or Medicaid

150,000

Highest-risk individuals identified

NEIL

Solution: “Test & Manage in Place” for Managing the States Vulnerable Population

Purpose Vulnerable populations are at greater risk of contracting COVID-19 and experiencing poor outcomes, which will further burden statewide healthcare resources. Changes to the traditional mechanisms of support and additional interventions are required to minimize transmission, healthcare utilization, and mortality among vulnerable populations and all Marylanders.

TASK FORCE

The task force will develop a comprehensive response plan for vulnerable populations at greatest risk for poor outcomes from COVID-19

ON-SITE TEAM

Clinical team to assess for symptoms, treat in place, and triage if hospital care needed.

+

Social workers to manage and connect to resources

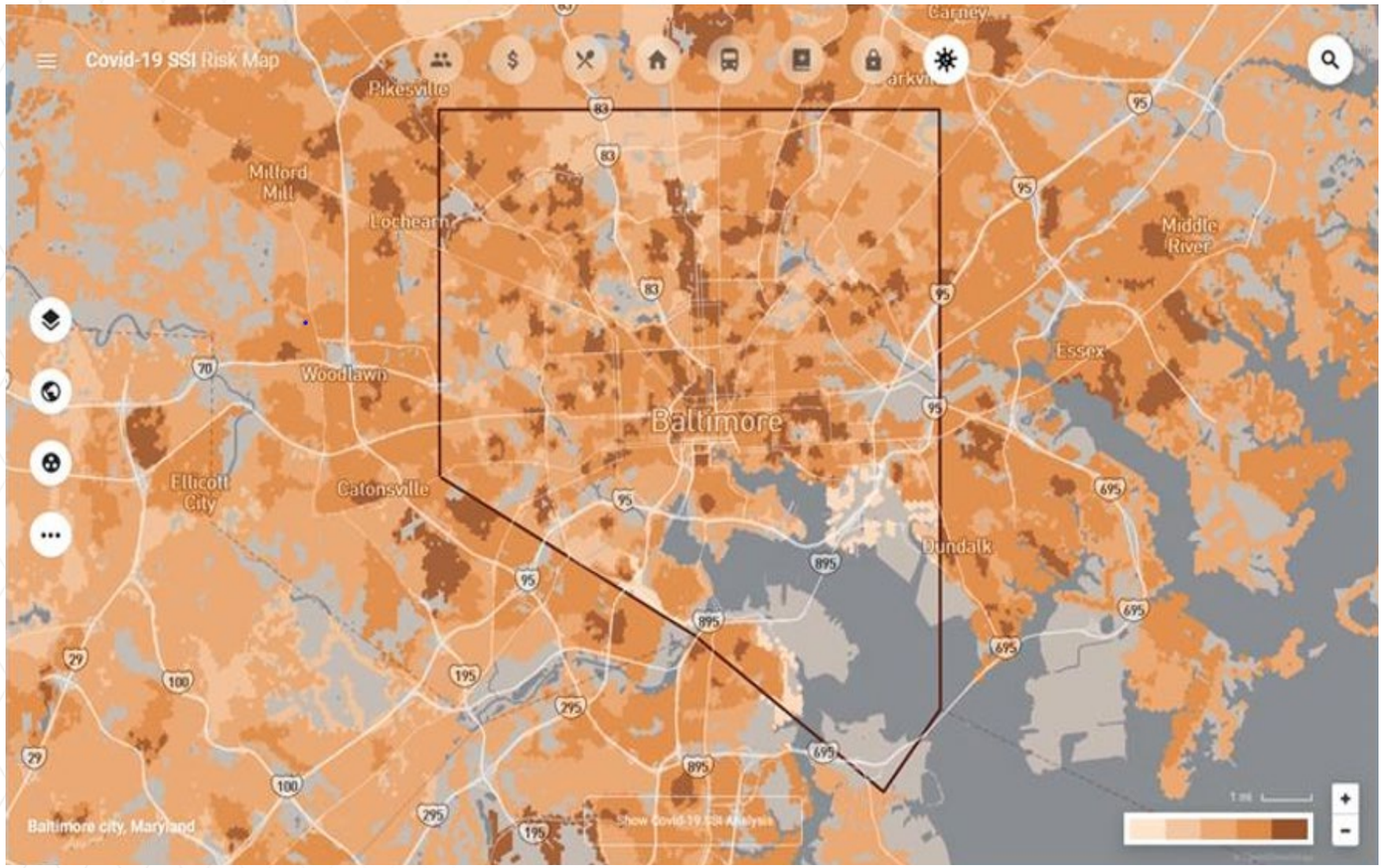
DELIVERABLES

1. Identify vulnerable populations
2. Identify necessary resources for vulnerable populations
3. Create educational materials
4. Create a communication cascade structure between the state, county, and on-site teams

GOAL: Engage all concentrated populations in high risk areas

Homeless Populations are also at Increased Risk for Infection Given Existing Health and Housing Status

NEIL



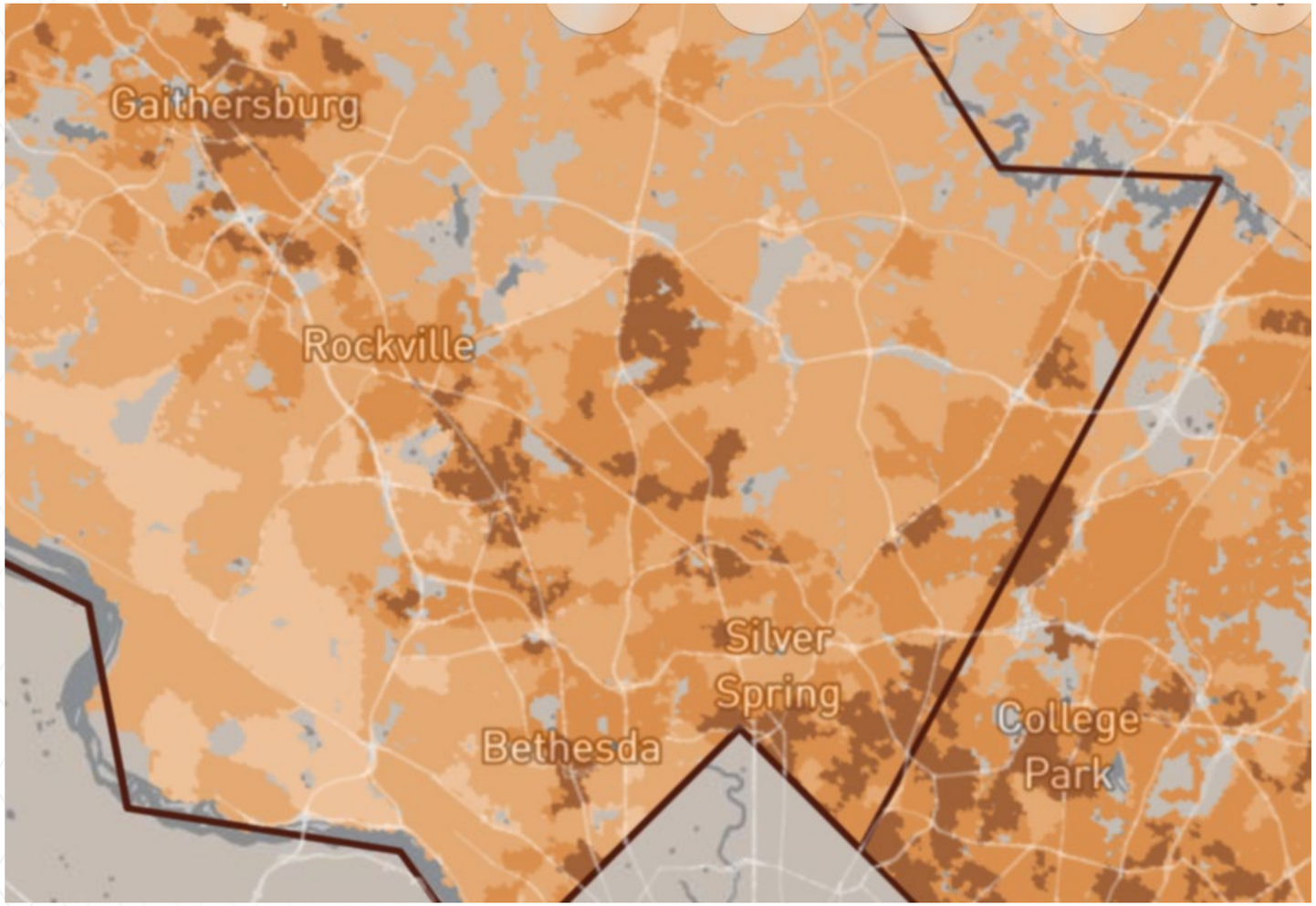
6K HOMELESS IN THE STATE

- **Homeless 1.6x** relative risk of death to general population historically
- Estimated rate of current undiagnosed COVID infection **>40%**

Homeless shelters don't have clinical teams or ability to socially distance at all

Elderly in Congregate Housing are also at Higher Risk of Hospitalization and Death

NEIL

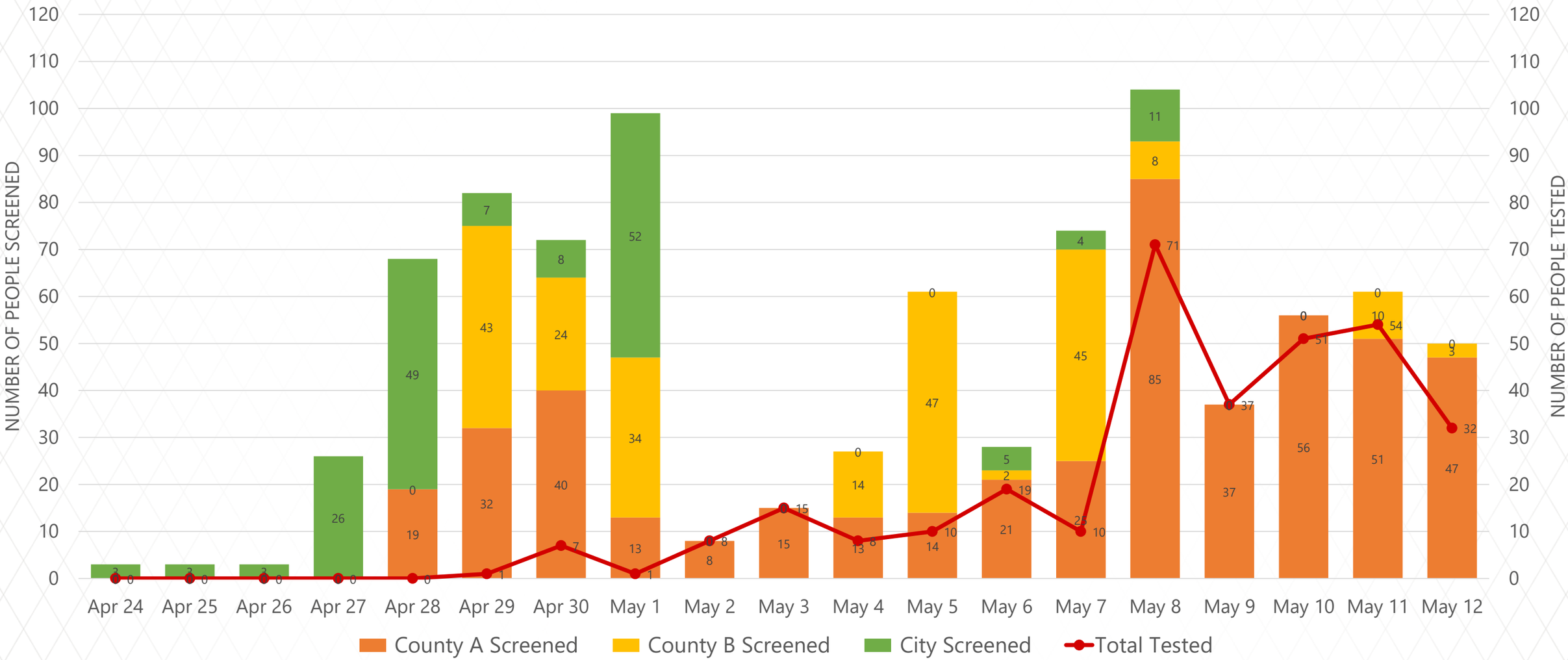


Congregate settings known to source of **heavy outbreaks and poor outcomes in other states**

At best this population today is getting remote outreach

TMIP Screening and Testing by County

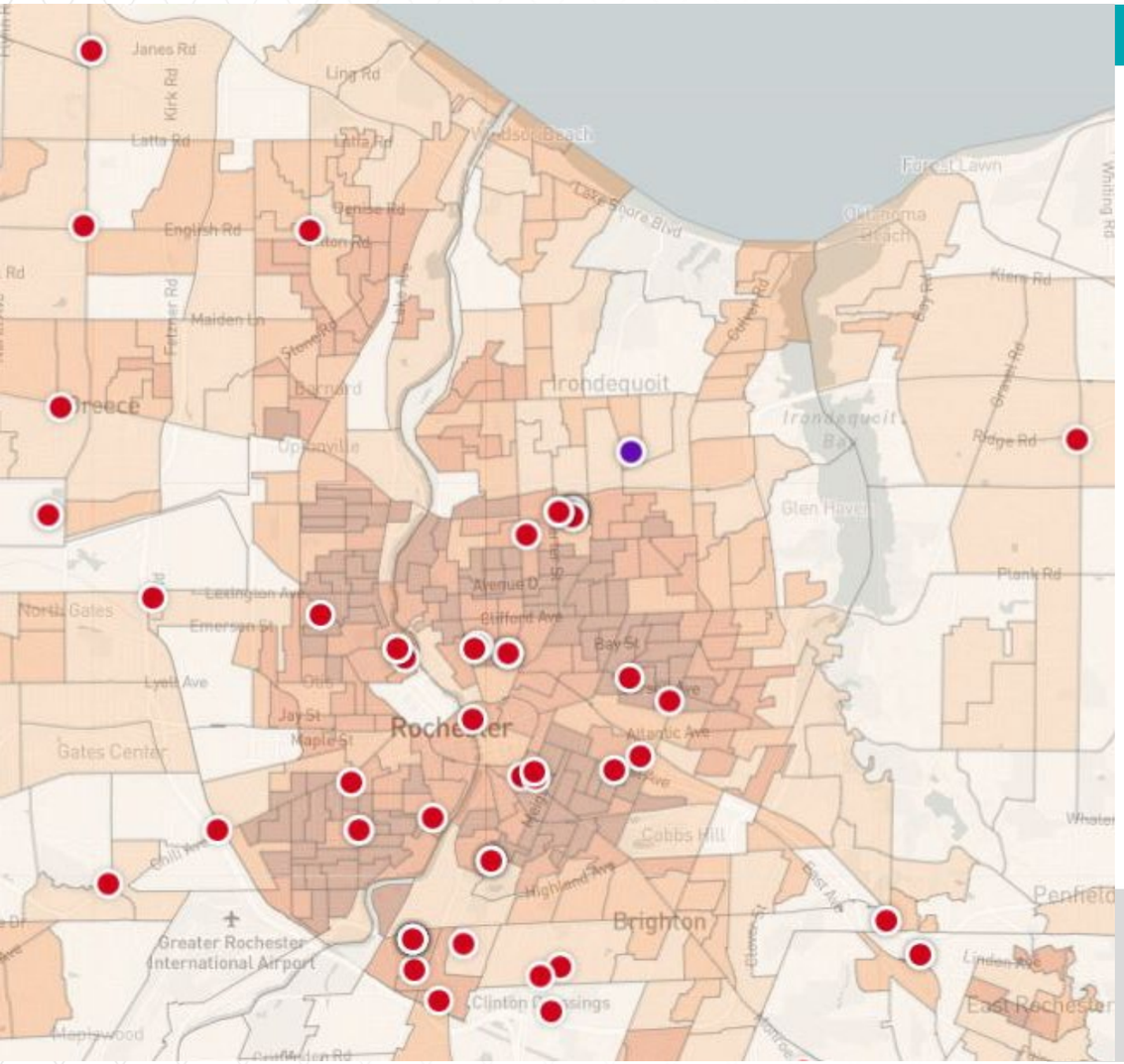
NEIL



Over 1K Engaged High Risk Residents and 300+ Tests in 19 Days

Market and System Alignment

FADY

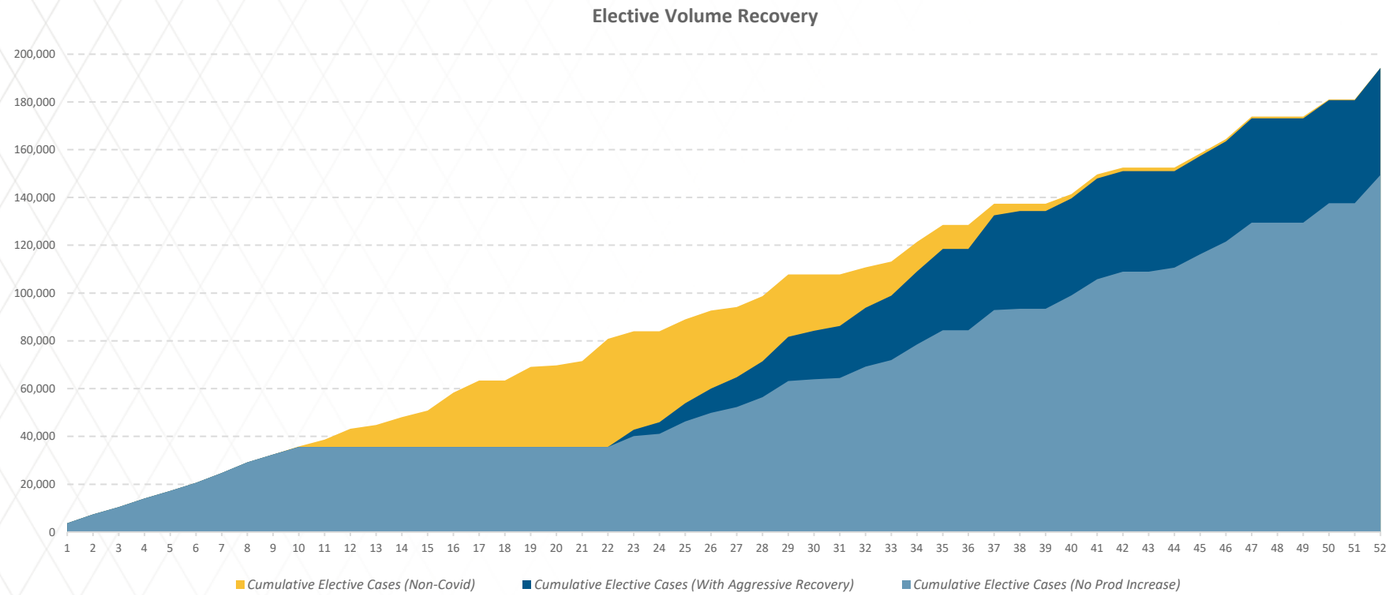


Demographics	COVID-19 Cases	Risk Factors	System Assets
1,291,857 Population	**10,156** Positive	**15.7%** 65+ Pop	**3** Acute Care
489,625 Households	**456** Deaths	**633** People/mi.^{2} Population Density	**108** Ambulatory Care
2.6 Avg. Household Size	**7.7%** State Positives	**5.7%** Unemployment	**11** Urgent Care

ACF ORs	ASC ORs	P/PO	ICU Beds	MS Beds	Vents
17	**12**	**116**	**78**	**625**	**110**

Deferred Volume Assessment Across the System

FADY

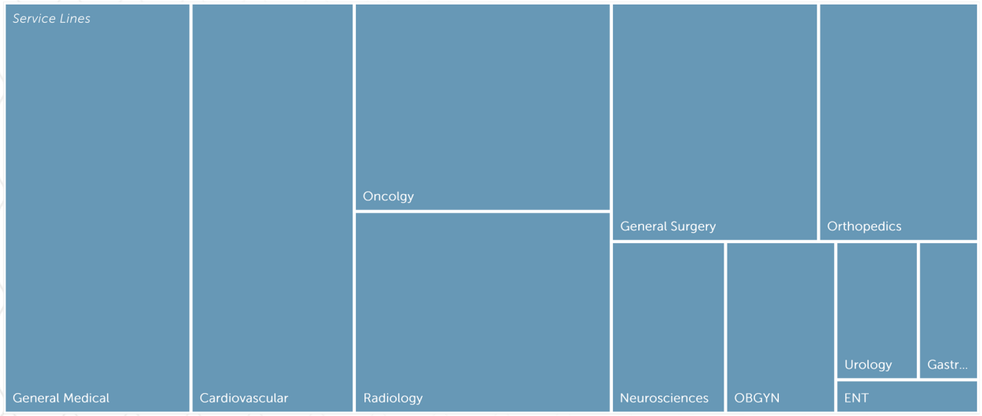


	IP Elective	OP Elective	IP Non-Elective	OP Non-Elective
System-Wide Annualized Procedure Volumes[1]	5,336	179,805	30,152	269,573
System-Wide Weekly Procedure Volumes[1]	103	3,458	580	5,184

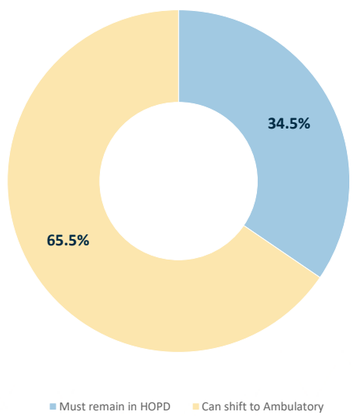
Deferral Start Date	3/15/2020
Duration of Elective Deferral (weeks)	12
Duration of Recovery Period (weeks)	16
% Loss of Deferred Procedures	5%

	Inpatient	Outpatient	Total
Annualized Elective Revenue	$46.0M	$103.4M	$149.4M
Weekly Elective Revenue	$885K	$2.0M	$2.9M
Revenue Impact of 12 Week Elective Deferral	$10.6M	$23.9M	$34.5M

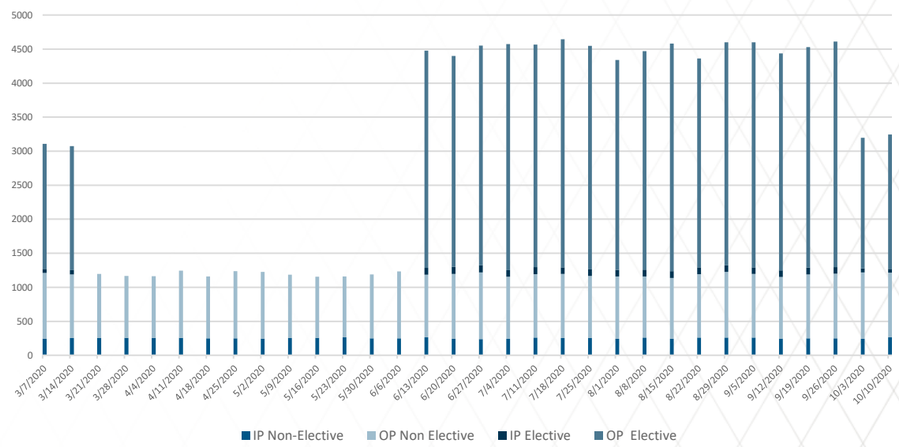
System-wide services accounting for most deferred revenue:



How many deferred cases can be shifted to ambulatory facilities?



Weekly Case Volume - COVID 19 Deferral of Elective Procedures

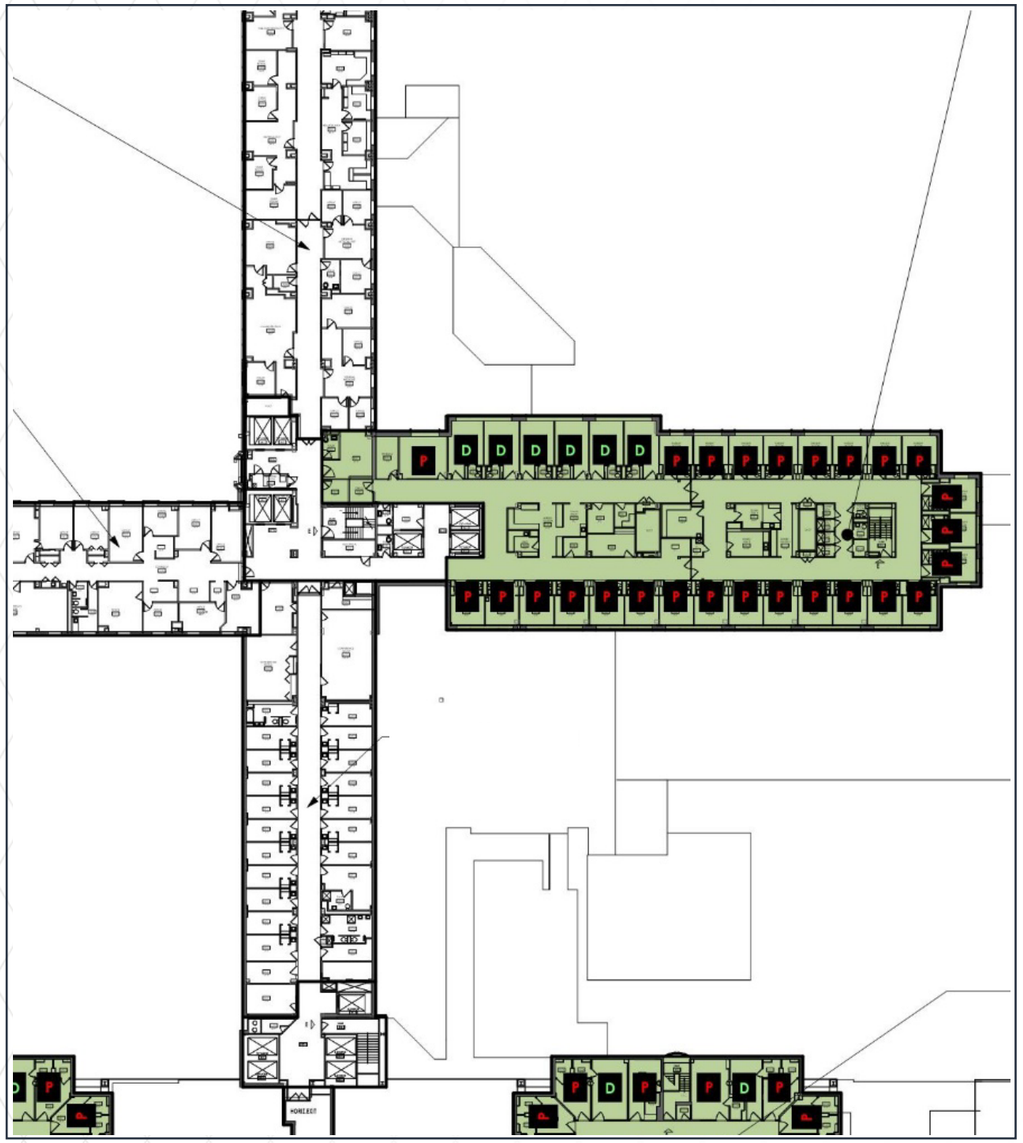


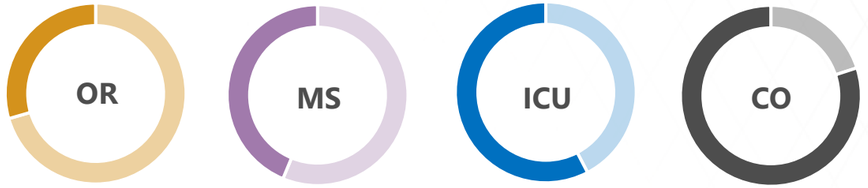
powered by ARRAY analytics OPTUM®

1) Excluding office-based activity

Individual Asset Utilization Modelling

FADY





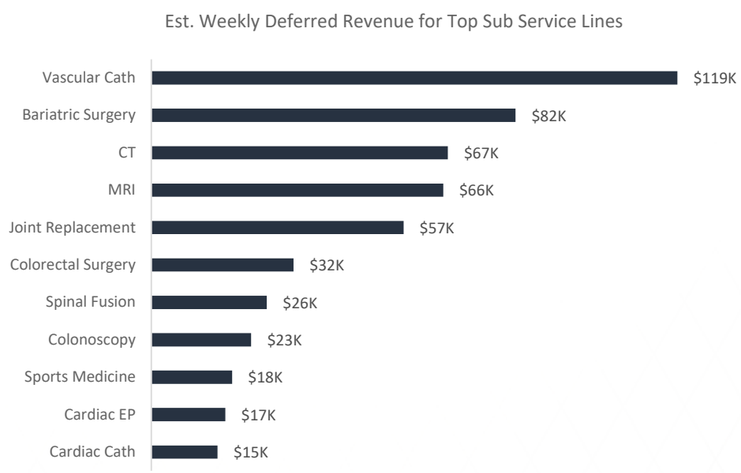
Facility Program:

Dept/Location		TL SQ Ft	Spaces	Room sqf	Bath sqft	²t.Rmsqf	TI Pt sqft
OR Complex		17000	8	450	0	450	3600
Rooms 1 & 5		-	2	650	0	650	1300
PACU		5500	16	120	0	120	1920
Endo Complex		2500	4	300	0	300	1200
Satge II Recovery/Pre-Op		5000	22	100	0	100	2200
OR Offices		4000	-	-	-	-	-
PAT Complex		3500	-	-	-	-	-
Surgical ICU		10000	12	220	40	260	3120
Rehab		3000	-	-	-	-	-
Surgical PICU		11000	13	171	37	208	2704
Medical/Surgical Complex		22000	37	171	37	208	7696
Elevator Lobby's and Elevators		3500	-	-	-	-	-
Surgical Waiting		1000	-	-	-	-	-
2nd East addition	36 rooms	30000					
Pastoral Care		2500	-	-	-	-	-
TOTAL		**120500**	**114**				**23740**

Dept/Location	TL SQ Ft	Spaces	Room sqf	Bath sqft	²t.Rmsqf	TI Pt sqft
Gen Medical ICU	10000	12	220	40	260	3120
Dialysis	2000	6	100	0	100	600
Gen Medical PICU	11000	13	171	37	208	2704
Gen Medical Med/Surg	22000	37	171	37	208	7696
Administration	4000	-	100	0	100	-
Elevator Lobby's and Elevators	3500	-	-	-	-	-
3rd floor shell	30000					
TOTAL	**82500**	**68**				**14120**

Dept/Location	TL SQ Ft	Patient Spaces	Room sqf	Bath sqft	²t.Rmsqf	TI Pt sqft
Cardiac ICU	10000	12	220	40	260	3120
Cardiac PICU	11000	13	171	37	208	2704
Cardiac Med/Surg	22000	37	171	37	208	7696
CardioPul Complex	4000	-	-	-	-	-
Cardiac Outpatient Rehabilitation	2000	-	-	-	-	-
Elevator Lobby's and Elevators	3500	-	-	-	-	-

Revenue Profile:



Provider Name	Specialty	Est. Deferred Volumes in Key SSL's Over 12-week Period
Xxxxxxxxx	Gastroenterology	181
Xxxxxxxxxxxxxxx	General Surgery	166
Xxxxxxxxxxxxxxxxxx	Gastroenterology	126
Xxxxxxxxxxxx	General Surgery	99
Xxxxxxxxxxxxxxxx	Gastroenterology	93
Xxxxxxxxxxxxxx	Orthopedic Surgery	76
Xxxxxxxxxxxxx	Gastroenterology	75
Xxxxxxxxxxx	Colorectal Surgery	69
Xxxxxxxxxxxxxxx	General Surgery	55
Xxxxxxxxxxxxxx	Orthopedic Surgery	46
Xxxxxxxxxxxxxxxxxxxx	Gastroenterology	39
Xxxxxxxxxxxxx	General Surgery	37
Xxxxxxxxxxxxx	Vascular Surgery	36
Xxxxxxxxxxxxxx	Orthopedic Surgery	36
Xxxxxxxxxxxxxx	Cardiology	33
Xxxxxxxxxxxxx	General Surgery	33
Xxxxxxxxxxxxxx	Vascular Surgery	32
Xxxxxxxxxxxxxxxx	Orthopedic Surgery	27
Xxxxxxxxxxxxxx	Orthopedic Surgery	25
Xxxxxxxxxxxxx	Cardiology	25
xxxxxxxxxxxxxxxxxx	Orthopedic Surgery	24

powered by ARRAY analytics OPTUM®

1) Excluding office-based activity

Design Parameters for Post COVID 19 Operations

LISA

FACILITY CONSIDERATIONS

SAFETY/INFECTION CONTROL

EXPERIENCE/ PATIENT & STAFF

IMPLEMENTATION AND IMPACT

Design Response to COVID | Ambulatory Practices

LISA

Staff Safety Considerations

- Staff based on demand
- Screening/testing protocols
- Provide adequate PPE and protocols
- Articulate dress policy. Provide changing areas and secure, clean space for personal belongings
- Safety huddles
- Social distancing measures
  - Visual cues
  - Eliminate workstations
  - Provide dividers/barriers in shared areas
- Lunch/lounge/meal prep schedule
- Respite/Recharging areas
  - Music, aroma, nature

Facility Considerations

- Ventilation
  - Consult with engineer regarding existing systems, air changes, humidification
- High Touch Surfaces
  - Self-cleaning barriers
  - Cleaning/sanitization policy
  - Touchless hardware
- Elevators (verify feasibility)
  - HEPA filter retrofit
  - Pre-programmed stop
- Toilets
  - Toilet seat lids

Design Response to COVID | Ambulatory Practices

LISA

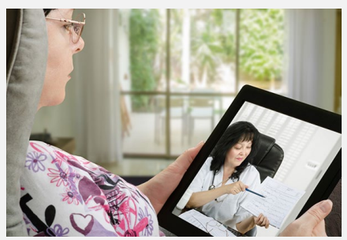
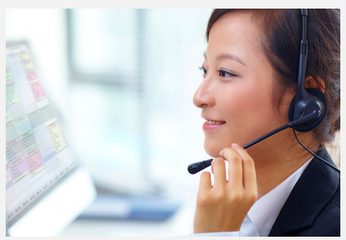
Pre-Visit Considerations

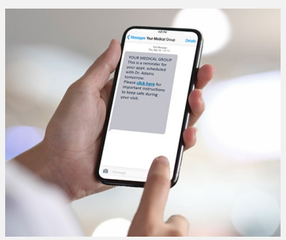
Advance communication

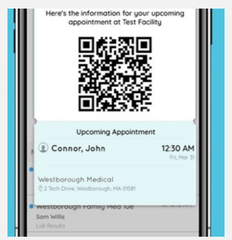
- Implementation of safety measures
- Testing philosophy and policy
- Arrival and intake instructions
- PPE policy
- What to expect during your visit
- Support member policy
- Advance registration and check-in
- " If you are sick" instructions
- Identification of unique patient populations
  - Immune compromised
  - Mobility impaired

On-Site Considerations

- Arrival
  - Wait-in-car if feasible
  - Communication methods
- Screening
  - Thermal scans
  - Temperature/pulse-ox
- Staff Concierge
  - Guidance
  - PPE station/assistance
  - Sanitization of common area
- Waiting
  - Social distancing measures/cues
- Contactless Check-In
  - Technology options
  - EMR module for check-in
  - Touchless kiosk/scanner
- QR codes
- Immediate/self-rooming





Design Response to COVID | Ambulatory Practices

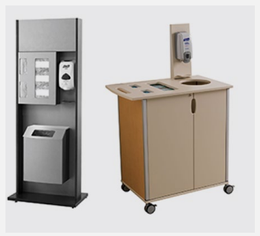
LISA

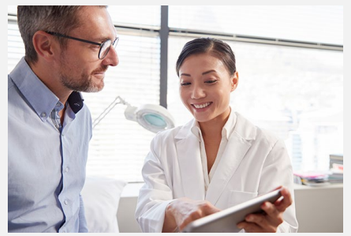
Examination/Intake

- Vitals in exam room
  - Digital scale
- Hand sanitization/handwashing automation
- PPE
- Supply policy for distribution and storage at point-of-use
- Active and passive infection prevention measures
  - Surface covers
  - Sanitizing computer keyboard or personal device
  - Cleanable products and surfaces
  - UV/Hydrogen peroxide technology
- Trash/hazardous waste disposal process

Check-Out

- In-room
  - Instructions, payment, scheduling, prescriptions
  - Consider printers
- Exiting
  - One-way flow (if feasible)
  - PPE disposal
- Room sanitization





Design Response to COVID | Hospital Based Ambulatory Services

LISA

Facilities Considerations

- Dedicated COVID sites?
- Site and access
- Limit access points
- Specific testing locations on site
- Tent structures

Staff Safety Considerations

- Advance communication of test results
- Communication/shift change protocols

Check Out Our Toolkit

https://info.array-architects.com/covid19-outpatient-toolkit

Pre-Visit Considerations*

- Scheduled or emergent processes

On-Site Pre-Visit Considerations*

- Managing the cue/patient on-deck
- Evaluate hours of operation to accommodate volumes
- Patient support member waiting
- Navigation throughout the facility

Examination/Procedure/Testing*

- Patient separation
- Required clinical environment

Check-Out/Departure*

- Discreet egress

* Will need to define policies/procedures for COVID and NON-COVID patient populations

Design Response to COVID | Ambulatory Practices

LISA

Minimize products and equipment in rooms. Utilize self-cleaning technologies

Remove cloth privacy curtains or consider disposable curtains if still desired

Increase cleaning protocols between patient visits.

Schedule appointments to alternate providers in and out of office and accommodate added time for sanitization

Enhanced clinic after daily sessions

Leave high-traffic doors open or provide touchless operation

Provide clear plastic screen between front desk staff and patients

Minimize need to wait/allow waiting in car. Schedule to allow for longer room turn-around

Provide hand sanitizer dispensers on both side of exam room doors

Provide hand sanitizer dispensers in elevator lobby and throughout

Reorganize seating to accommodate social distancing

Daily safety and plus/delta huddles

Eliminate workstations Provide clear plastic barriers to define safe workstation distances

Provide PPE dispenser in elevator lobby

Provide barriers between two phlebotomy chairs or limit to (2) patients at a time

Expand or even mandate patient be pre-registered for appointments to reduce staffing

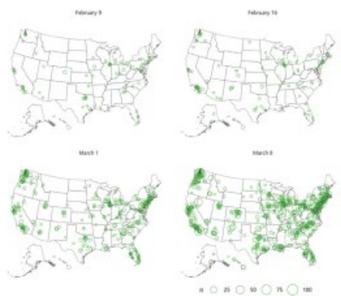
How COVID-19 Is Shaping the Patient Experience

LISA

An Analysis of 350,000 Patient Comments

PRESS GANEY

How COVID-19 Is Shaping the Patient Experience
An Analysis of 350,000 Patient



In a Press Ganey analysis of 350,000 comments from ED and medical
March 20, 2020, the number of comments mentioning COVID-19 has g
week from early February through mid-March.

To identify emerging themes and provide insights and recommendatio
and analyzed the nearly 12,000 COVID-19–related comments, generati
leading to the following observations.

Observations from Patients' COVID-

The number of comments mentioning key topics such as tests and cleanliness spiked quickly from the early days of the pandemic.

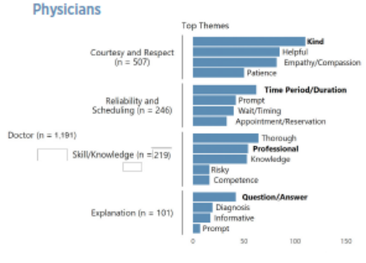
Patients rep
for COVID-1
positive cor

What this tells us:

Analyzing patient comments and identifying themes provides organiz
understanding and anticipating heightened patient needs and a stron
communication plans to respond effectively.

Awareness and Appreciation for Caregivers

A top theme that emerged from our analyses of patients' COVID-19–r
for providers and caregivers. In particular, patients recognize the pers
face under the present circumstances.



Recommendations for Building Strong Careg

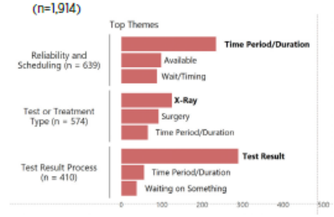
Share these insights with physicians and caregivers to remind them
doing during this crisis.

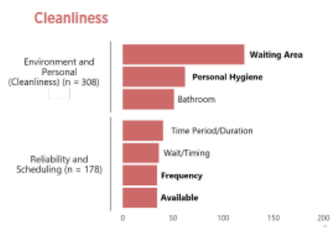
Educate and encourage physicians and caregivers to use the follow
a connection with each patient at the start of every encounter.

- Make eye contact and be aware of body language.
- Introduce yourself and your role.
- Acknowledge the current situation with a core safety message.

Concerns About Testing Delays and Cleanliness

A large number of patients' negative COVID-19–related comments me
Of note, concerns about delays were mitigated when caregivers comr
to set expectations. The apparent cleanliness of the care setting and s
indicating patients' heightened awareness of hygiene and safety prac
of personal protective equipment, and sanitizing efforts.





Recommendations for Building Patient Trust

Caregivers and staff should consistently communicate with patients about t

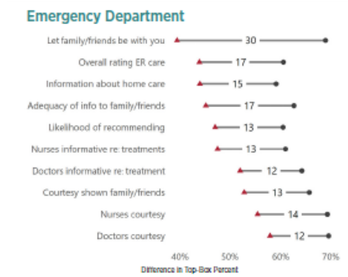
Providers and health systems experiencing capacity challenges related t
likely impacts on access and timing of treatment.

Caregivers and staff should practice **Universal Reliability Skills** for check

- Encourage and affirm safe behaviors such as handwashing and s
- Discourage and correct unsafe behaviors such as shaking hands.
- Narrate all care being provided.

Impact on Patients' Rating of Experience

Patients with COVID-19 comments in their survey responses were more likely to rate many other areas of care lower than those who did not mention COVID-19. Although these analyses are based on surveys completed during the first wave of the pandemic, the observed rating differences are significant for all of the measures shown.



For both medical practice and ED patients, wide gaps are seen in items measuring patients' perceptions of the quality of the **instructions and information** they received and whether providers **listened to and respected** them. Gaps are also evident in global items such at Rate the Provider/ED and Likelihood to Recommend.

The widest gap in top-box performance is in the Emergency Department domain rating providers' **willingness to let family and friends be present**, likely reflecting the changing policies associated with COVID-19 precautions.

Communication and Transparency: Meeting Needs Today to Build Enduring Trust

Extended periods of uncertainty give rise to unanticipated needs and anxiety. The nature of the coronavirus pandemic has led patients and caregivers to look to health systems and their leaders for reassurance. Patients and families respect the commitment and risk that front-line caregivers have embraced and are relying on them in this time of crisis. Understanding and meeting their needs with communication and transparency is essential. This is a critical moment and important opportunity to build unbreakable bonds of trust with patients and families that will extend long past the pandemic.

Consult Press Ganey's guide,
"High-Leverage Skills: Top 3 Actions to Support Safe, Exceptional Care in Crisis Situations,"
on the COVID-19 resources page at pressganey.com/COVID19.

© 2020 Press Ganey Associates LLC

Source: pressganey.com

NEIL

Shifting the Conversation

ON VALUE

Increased Coverage Hasn't Slowed Health Care Costs…

NEIL

HEALTH POLICY BRIEF WWW.HEALTHAFFAIRS.ORG 1

HealthAffairs | Robert Wood Johnson Foundation

Health Policy Brief

JULY 16, 2015

The Oregon Health Insurance Experiment.
A 2008 lottery extending Medicaid to selected residents allowed for a randomized study on the impact of Medicaid coverage.

WHAT'S THE ISSUE?

One of the principal strategies contained in the Affordable Care Act (ACA) to achieve near-universal health insurance coverage is expansion of eligibility for the Medicaid program. There has been much debate about whether expansion of the Medicaid program should be used to extend health care benefits to the low-income uninsured.

This brief summarizes findings of the Oregon Health Insurance Experiment, a randomized controlled study made possible by a unique lottery process used in 2008 to expand Medicaid coverage in the state. The study addresses many of the issues being considered by policy makers, including take-up rates and characteristics of enrollees; use of health services; health outcomes and measures of well-being; enrollee finances and medical debt; as well as indirect societal effects on labor markets, private insurance coverage, and participation in other public programs.

WHAT'S THE BACKGROUND?

Medicaid, established under Title XIX of the Social Security Act (SSA), is the jointly financed federal and state program that provides comprehensive health insurance coverage to many of the poorest Americans. States must meet certain minimum federal requirements in terms of the populations that must be covered, minimum benefits, and service delivery but otherwise have flexibility to tailor their programs within federal parameters. Under section 1115 of the SSA, the secretary of health and human services (HHS) has broad authority to grant demonstration waivers that allow states to implement their Medicaid programs in ways that deviate from federal requirements, so long as the programs are determined by the agency to promote Medicaid objectives.

Prior to implementation of the ACA, in the absence of a waiver, eligibility for Medicaid was limited to individuals with limited income and assets who fell within specified categories such as children, pregnant women, parents of eligible children, and individuals with disabilities. States could not receive federal Medicaid matching funds for individuals who did not fall within one of the specified categories. Those excluded from eligibility consisted primarily of low-income nondisabled childless adults.

The Oregon Health Plan

In the late 1980s, with approximately 18 percent of Oregonians uninsured, a group of citizen activists engaged the state in a discussion of the ethics of the existing Medicaid system that granted comprehensive health benefits

©2015 Project HOPE–The People-to-People Health Foundation Inc.
10.1377/hpb2015.10

Oregon experiment showed greater Medicaid coverage didn't necessarily reduce costs – Implying that **changing how health care delivery** is the only avenue to cost control

…Nor the Famous “Hot Spotting”…

NEIL

The New York Times

These Patients Are Hard to Treat

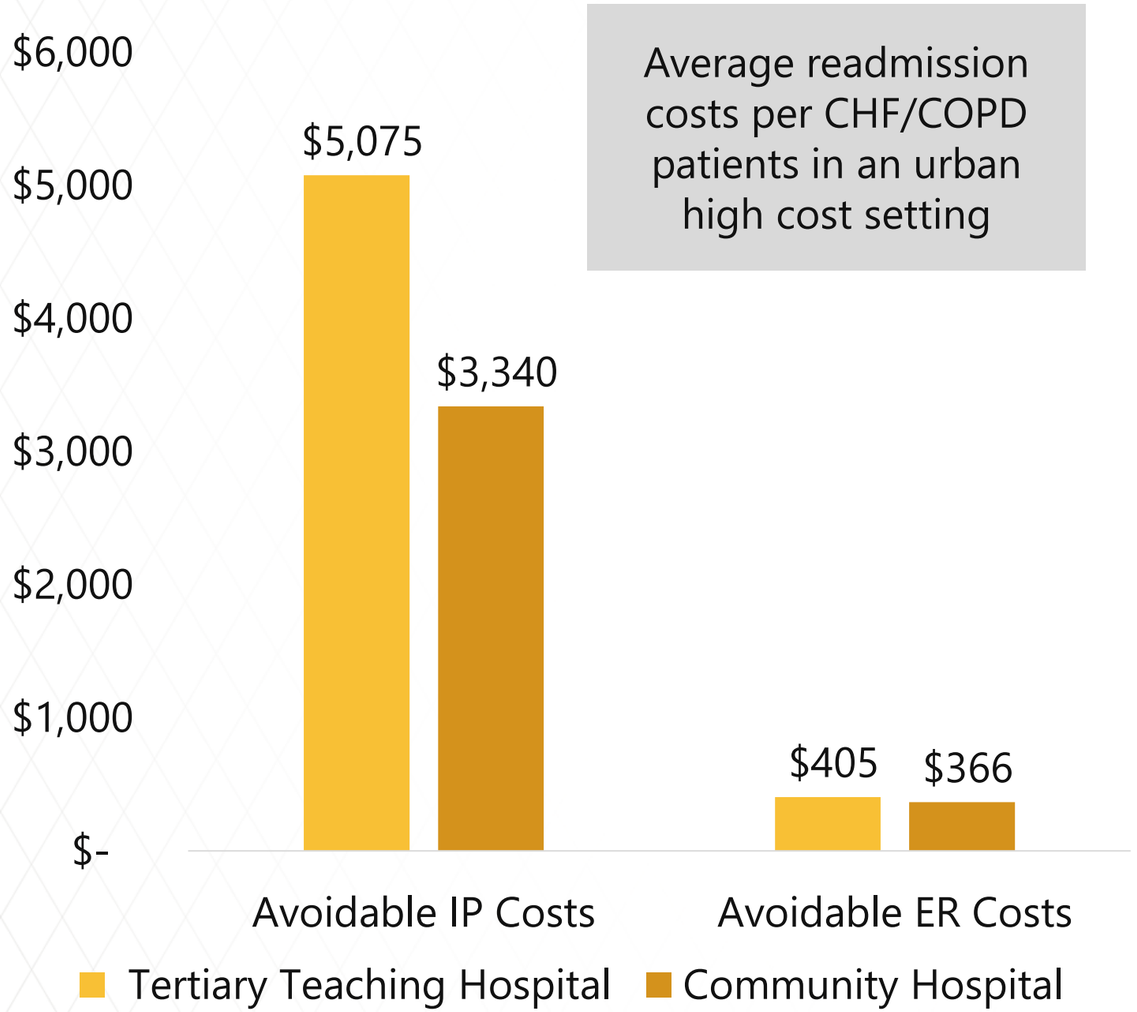
A study examined a popular approach that coordinated care for the most expensive patients, and found that the project did not reduce hospital admissions.

Cooper University Hospital in Camden, N.J. A project in the city to reduce hospital visits by addressing patients’ needs outside the hospital did not produce desired results. Mel Evans/Associated Press

Once the popular theory was compared to long term control group outcomes - the results were **very disappointing**.

…And basic hospital economics are too often overlooked… Charges are many times higher than marginal costs.

NEIL



Average readmission costs per CHF/COPD patients in an urban high cost setting

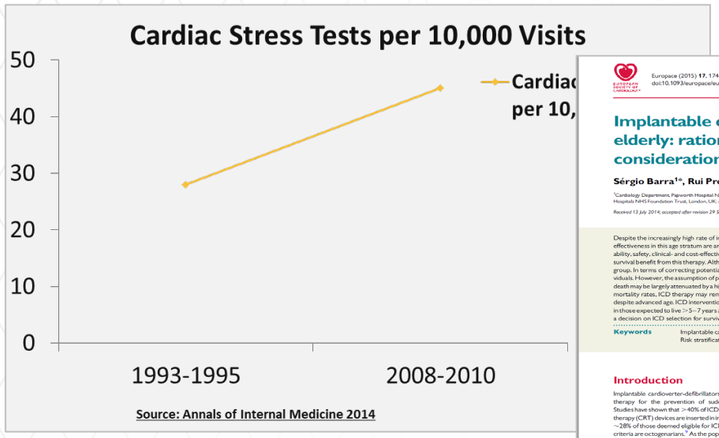
And incremental costs for avoided hospital stays are often **30-50%** of charges in the best case, depending on the type of institution you are and how volume allows nurse staffing levels to change.

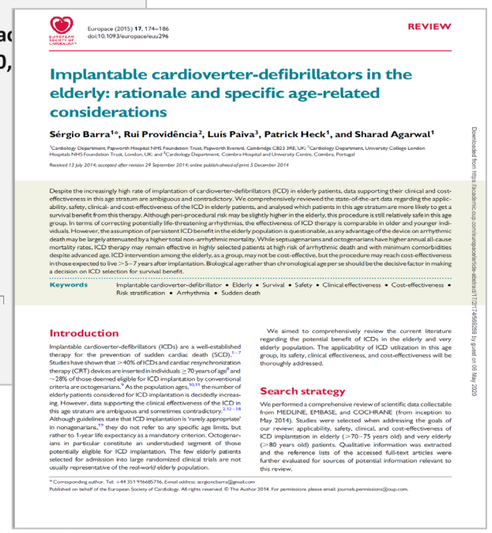
By comparing pop health interventions to marginal costs instead of charges, make many of the ROI of those projects negative.

… Solution – Less Low Value Care and Automation

NEIL

Cardiac





Europace (2015) 17, 174–186
doi:10.1093/europace/euu296

REVIEW

Implantable cardioverter-defibrillators in the elderly: rationale and specific age-related considerations

Sérgio Barra[1]*, Rui Providência[2], Luís Paiva[3], Patrick Heck[1], and Sharad Agarwal[1]

[1]Cardiology Department, Papworth Hospital NHS Foundation Trust, Papworth Everard, Cambridge CB23 3RE, UK; [2]Cardiology Department, University College London Hospitals NHS Foundation Trust, London, UK; and [3]Cardiology Department, Coimbra Hospital and University Centre, Coimbra, Portugal

Received 13 July 2014; accepted after revision 29 September 2014; online publish-ahead-of-print 2 December 2014

Despite the increasingly high rate of implantation of cardioverter-defibrillators (ICD) in elderly patients, data supporting their clinical and cost-effectiveness in this age stratum are ambiguous and contradictory. We comprehensively reviewed the state-of-the-art data regarding the applicability, safety, clinical- and cost-effectiveness of the ICD in elderly patients, and analysed which patients in this age stratum are more likely to get a survival benefit from this therapy. Although peri-procedural risk may be slightly higher in the elderly, this procedure is still relatively safe in this age group. In terms of correcting potentially life-threatening arrhythmias, the effectiveness of ICD therapy is comparable in older and younger individuals. However, the assumption of persistent ICD benefit in the elderly population is questionable, as any advantage of the device on arrhythmic death may be largely attenuated by a higher total non-arrhythmic mortality. While septuagenarians and octogenarians have higher annual all-cause mortality rates, ICD therapy may remain effective in highly selected patients at high risk of arrhythmic death and with minimum comorbidities despite advanced age. ICD intervention among the elderly, as a group, may not be cost-effective, but the procedure may reach cost-effectiveness in those expected to live >5–7 years after implantation. Biological age rather than chronological age per se should be the decisive factor in making a decision on ICD selection for survival benefit.

Keywords Implantable cardioverter-defibrillator • Elderly • Survival • Safety • Clinical effectiveness • Cost-effectiveness • Risk stratification • Arrhythmia • Sudden death

Introduction

Implantable cardioverter-defibrillators (ICDs) are a well-established therapy for the prevention of sudden cardiac death (SCD).[1–7] Studies have shown that ≥40% of ICDs and cardiac resynchronization therapy (CRT) devices are inserted in individuals ≥70 years of age[8] and ~28% of those deemed eligible for ICD implantation by conventional criteria are octogenarians.[9] As the population ages,[10,11] the number of elderly patients considered for ICD implantation is decidedly increasing. However, data supporting the clinical effectiveness of the ICD in this age stratum are ambiguous and sometimes contradictory.[2,12–18] Although guidelines state that ICD implantation is 'rarely appropriate' in nonagenarians,[19] they do not refer to any specific age limits, but rather to 1-year life expectancy as a mandatory criterion. Octogenarians in particular constitute an understudied segment of those potentially eligible for ICD implantation. The few elderly patients selected for admission into large randomized clinical trials are not usually representative of the real-world elderly population.

We aimed to comprehensively review the current literature regarding the potential benefit of ICDs in the elderly and very elderly population. The applicability of ICD utilization in this age group, its safety, clinical effectiveness, and cost-effectiveness will be thoroughly addressed.

Search strategy

We performed a comprehensive review of scientific data collectable from MEDLINE, EMBASE, and COCHRANE (from inception to May 2014). Studies were selected when addressing the goals of our review: applicability, safety, clinical, and cost-effectiveness of ICD implantation in elderly (>70–75 years old) and very elderly (≥80 years old) patients. Qualitative information was extracted and the reference lists of the accessed full-text articles were further evaluated for sources of potential information relevant to this review.

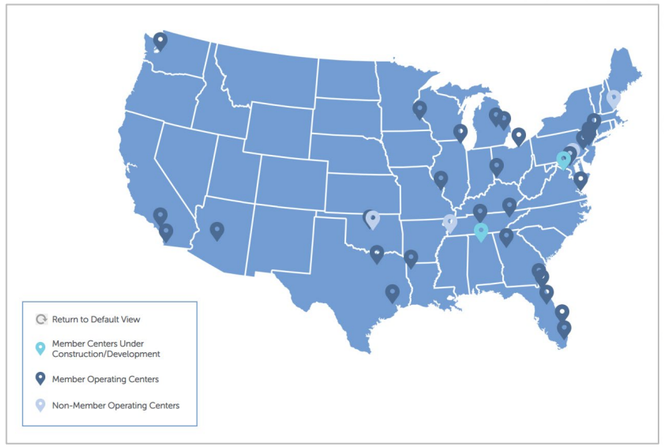
* Corresponding author. Tel: +44 351 916685716, Email address: sergiocbarra@gmail.com

Published on behalf of the European Society of Cardiology. All rights reserved. © The Author 2014. For permissions please email: journals.permissions@oup.com.

Downloaded from https://academic.oup.com/europace/article-abstract/17/2/174/2428208 by guest on 06 May 2020

Cancer

Map of Proton Therapy Centers in the U.S. (The National Association for Proton Therapy)



Case study 2: Proton beam therapy

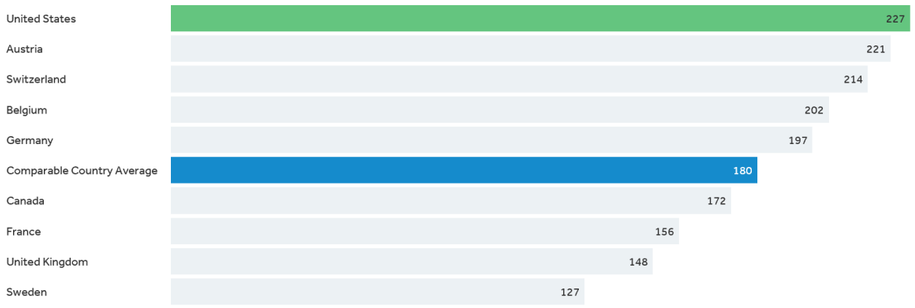
- Initially used for rare adult and pediatric cancers, but now also used for more common cancers
- Lack of evidence that it offers a clinical advantage over alternative treatments for common cancers
- Rapid growth in number of proton beam centers
- Medicare payment rates for proton beam much higher than other types of radiation therapy
- Medicare has few coverage restrictions
- Medicare volume and spending more than doubled from 2010-2016
  - Spending increased from $47 million to $115 million

MEDPAC Data are preliminary and subject to change 11

Orthopedics

The U.S. performs more knee replacements than comparably wealthy countries

Number of inpatient total knee replacements performed per 100,000 population, 2014

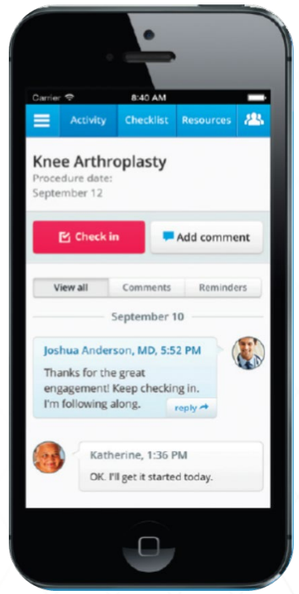


Note: Data not available for Australia, Japan, and the Netherlands.

Source: Kaiser Family Foundation analysis of data from OECD Health Statistics and the AHRQ Healthcare Cost and Utilization Project (Accessed on 31 January 2018)
• Get the data • PNG

Peterson-KFF Health System Tracker

Automation



HealthLoop App

NEIL

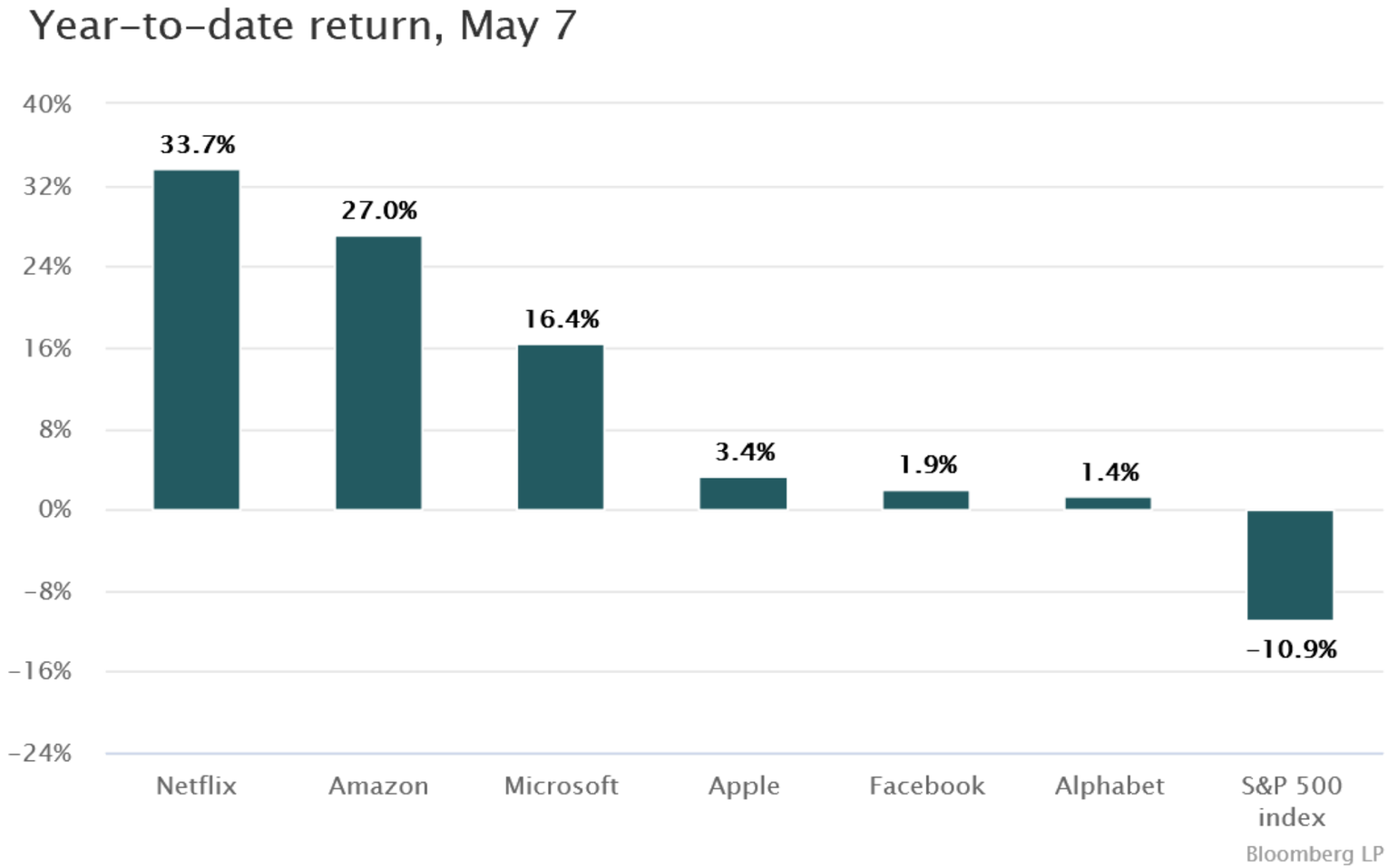
“The payment of five dollars a day for an eight-hour day was one of the finest cost-cutting moves we ever made, and the six-dollar-a-day wage is cheaper than the five. “

- HENRY FORD

The World (What's Left of It) Belongs to Tech….

NEIL

The FAANGs and Microsoft made up more than a fifth of the market cap of the S&P 500 index as of Tuesday May 7th

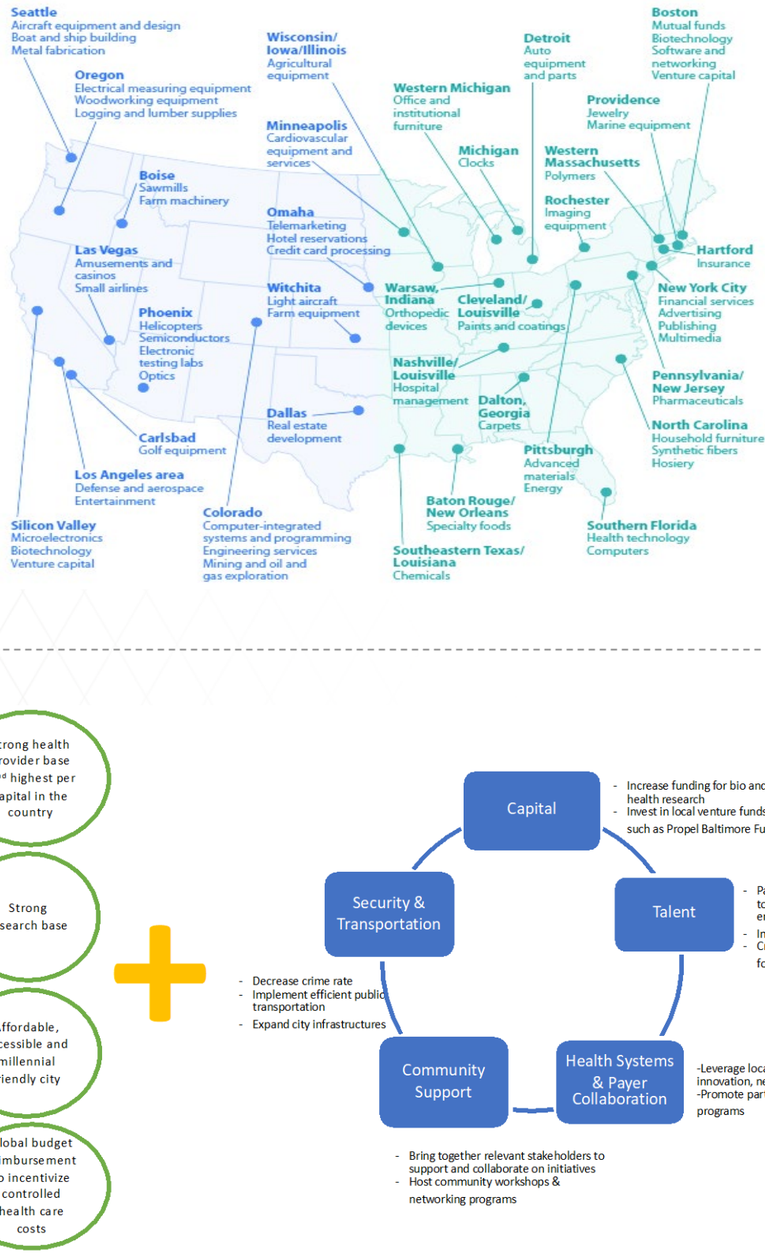


This is great news for a few health systems where these tech companies are based. But what about all the health providers **today** who work with everyone else?

Where does this leave your health system – which is really a local service provider?

Can Your Health System Inspire or Advocate a Vision for Your Region?

NEIL



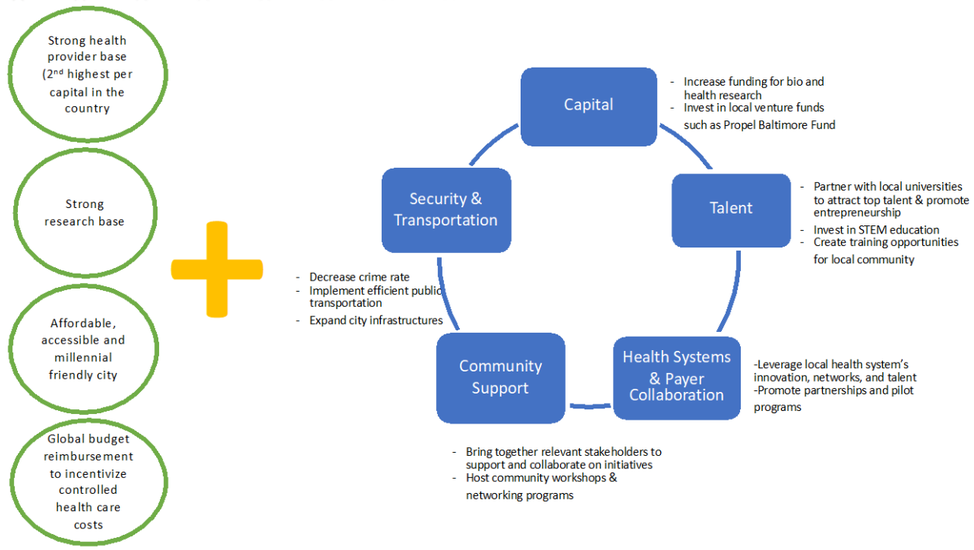
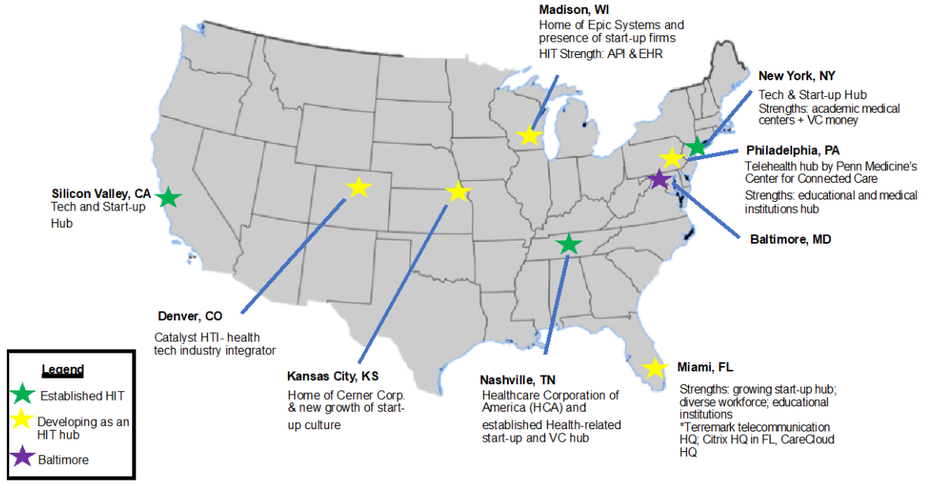


Figure 5: Decentralized Health IT (HIT) Landscape



		% of Baltimore's Employment	Annual Mean Wage for Baltimore	Existing Companies & Resources	Competition with other Regions	Evaluation	
Financial Services		5.56%	$76,520	Legg Mason & T-Rowe Price - headquarters	NY Based Cluster	High automation future	↓
Government		16.74%	~$58,944	Baltimore Local & Maryland State Gov't Social Security Admin (Woodlawn) Centers for Medicare and Medicaid Services (Baltimore) Defense Information Systems (Fort Meade) US Federal Government Contracts are primarily awarded to educational and research institutions (JHU & UMD BioParks) in the fields of: Computer Systems, Scientific Research, & Engineering	Washington, D.C. Based Cluster	Dependent on Taxes & Federal Government expansion	↓
Education		3.29%	$65,770	10+ Universities and Research Institutions	Strong Education System Clusters in Boston, Philadelphia, Los Angeles, & New York		
Healthcare & Social Assistance		15.37%	Healthcare Practitioners & Technical Occupations: $80,770	6 Healthcare Systems with over 15 hospitals and support platforms NIH & Federal Regulatory Bodies University and Research Institutions with educated student body in the fields of STEM	Pharmaceuticals - outside of Philadelphia Biotechnology - Boston & Silicon Valley Hospital Management - Nashville	Strong industry outlook & highly developed local resources	↑
Health Information Technology		—	$89,879* *Average National Health IT salary	Strong Healthcare Systems & Academic Research Institutions	cluster not yet formed, decentralized industry	Strong industry outlook & highly developed local resources	↑

Health Driven Regional Planning

Baylor, Texas A&M, UT, M.D. Anderson: Texas Medical Center

MIT, Harvard and MGH: Kendall Square

Children's National Pediatric Innovation District

FADY

- Align AMCs with firms, startups, spin-offs
- Attract national/global top talent
- Collaboration between major corporations and academic medical centers
- Engine for economic opportunity

- Multi-year evolution across multiple neighborhoods
- Mixed-use development, "Anchor plus"
- Labs, restaurants, retail, commercial
- Reversed land covenants to for-profit

"Our focus…includes a deep and historic understanding of what we call the 'power of proximity' to address pressing global challenges"

Israel Ruiz, MIT Executive Vice President and Treasurer

Q&A

CONTACT US:

Craig Meaney
Communications Manager
610-755-6488
@ArrayArch
cmeaney@array-architects.com