

TELEMEDICINE AND THE FUTURE OF DISRUPTION

June 11, 2018

B A L L I N G E R

SPEAKERS



LOUIS A. MEILINK, JR.
AIA, ACHA, ACHE
PRINCIPAL



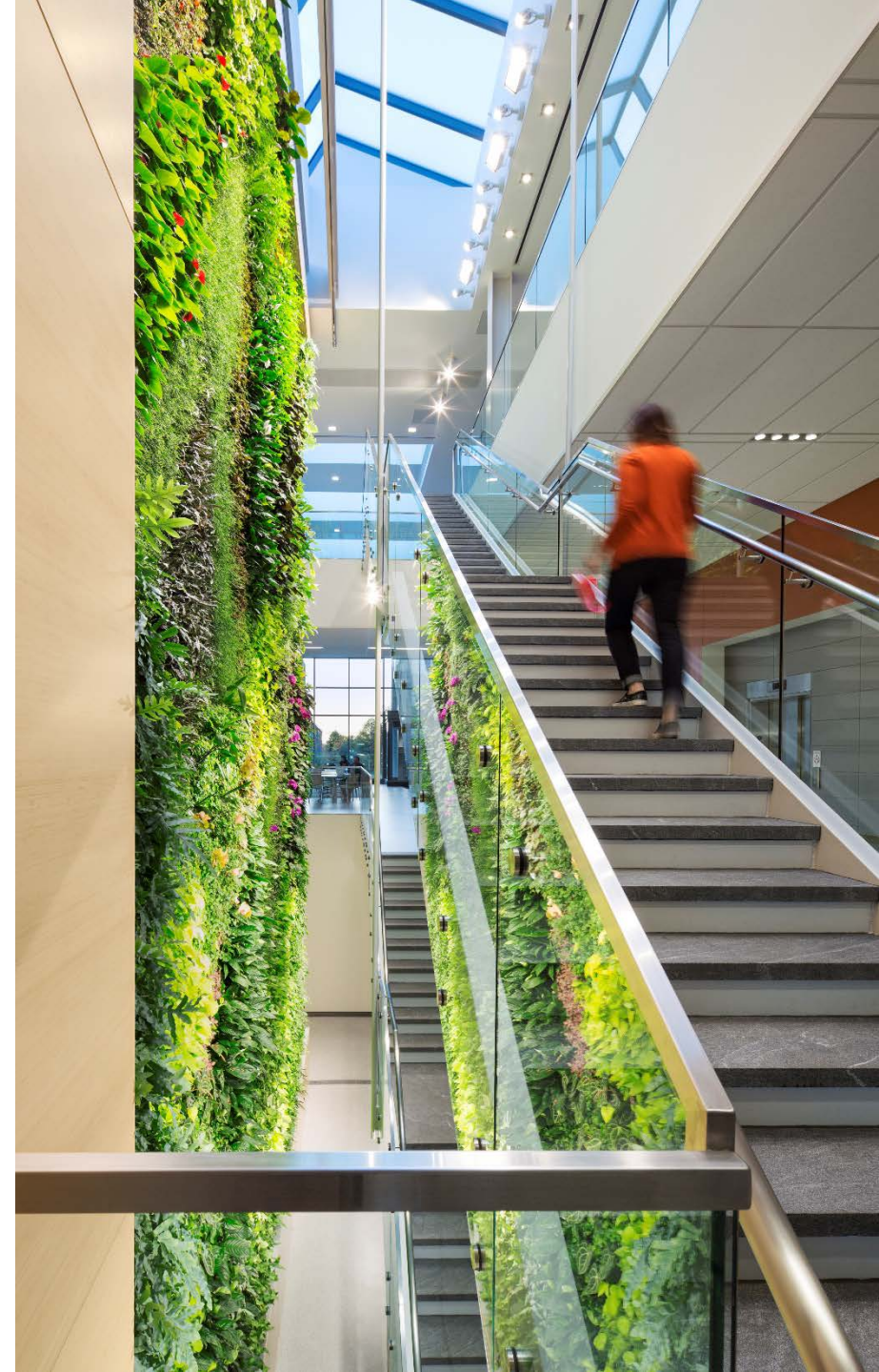
@LmeilinkA



CHRISTINA GRIMES
AIA, LEED AP BD+C, EDAC
SENIOR PROJECT HEALTHCARE PLANNER



@grimesarchitect



AGENDA

WHY IS TELEMEDICINE NEEDED?

- Access
- Cost
- Staff retention
- Chronic patient needs

WHAT IS TELEMEDICINE?

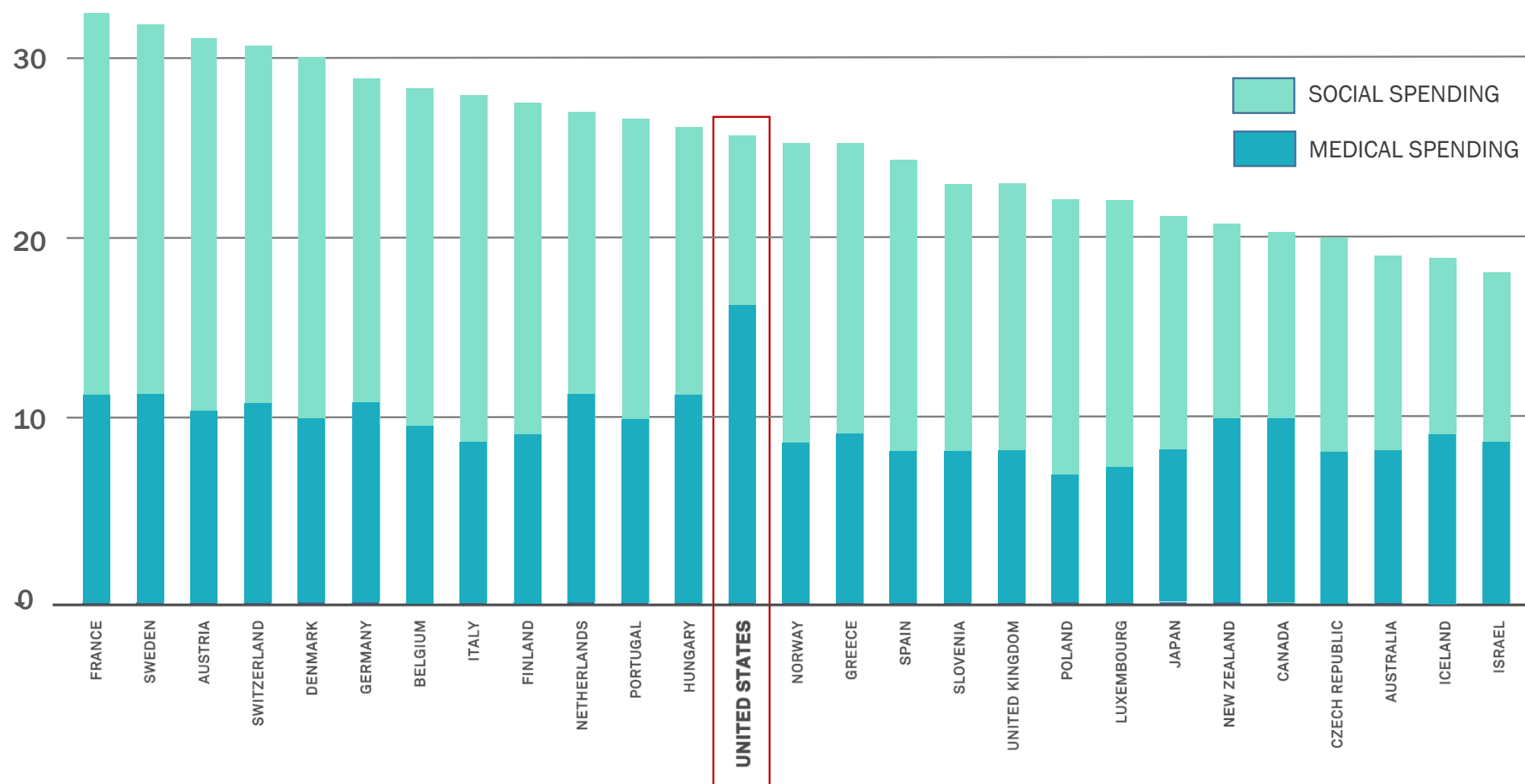
- Virtual visit
- Chronic care management
- Inpatient access to specialists
- Opportunities for clinician engagement

WHERE IS TELEMEDICINE?



WHY IS TELEMEDICINE NEEDED?

U.S. ANOMALY IN HEALTH AND SOCIAL SPENDING



HEALTHIEST COUNTRIES INDEX

1. Italy
2. Iceland
3. Switzerland
4. Singapore
5. Australia
6. Spain
7. Japan
8. Sweden
9. Israel
10. Luxembourg

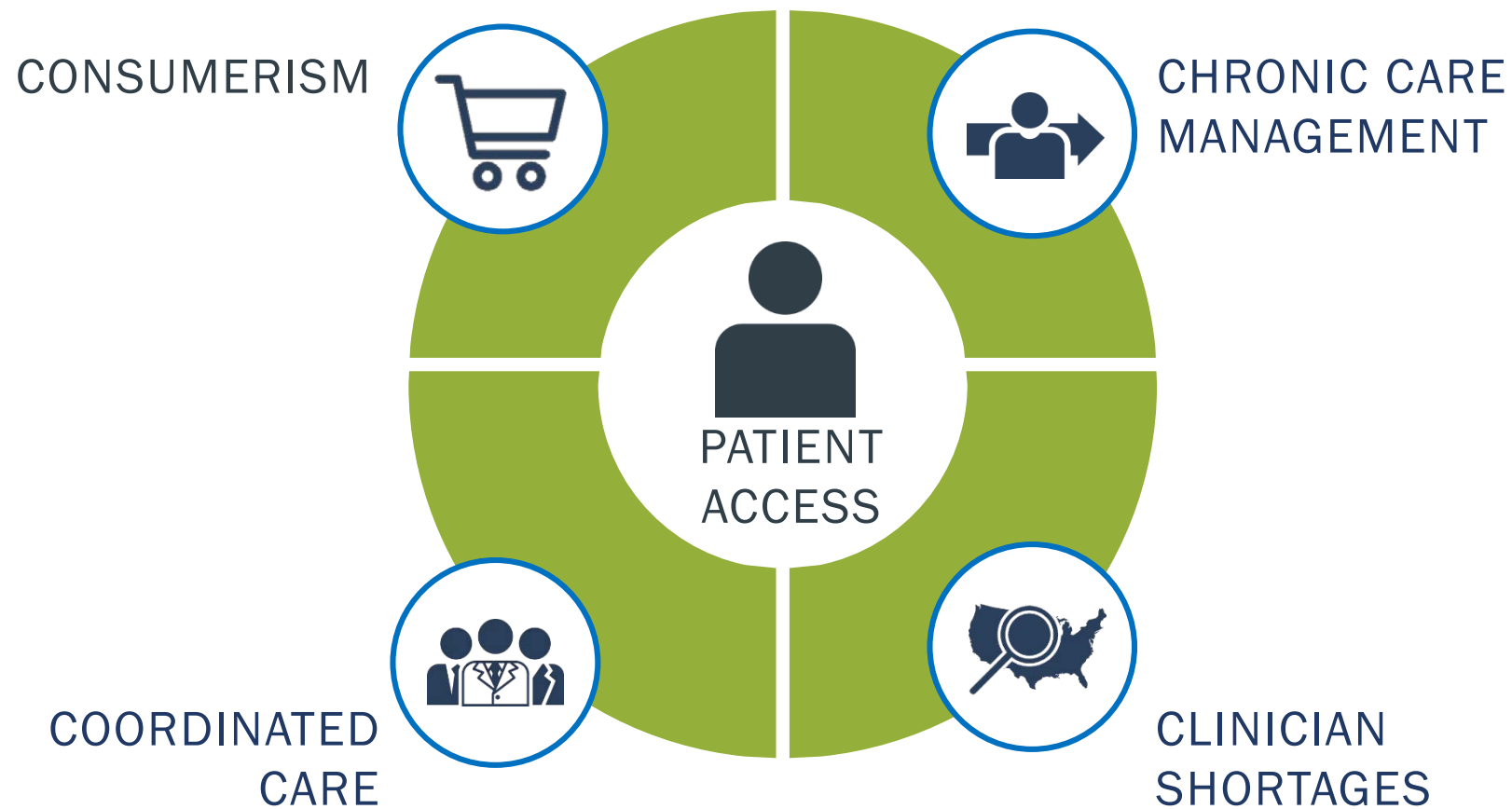


THE EVOLVING QUADRUPLE AIM



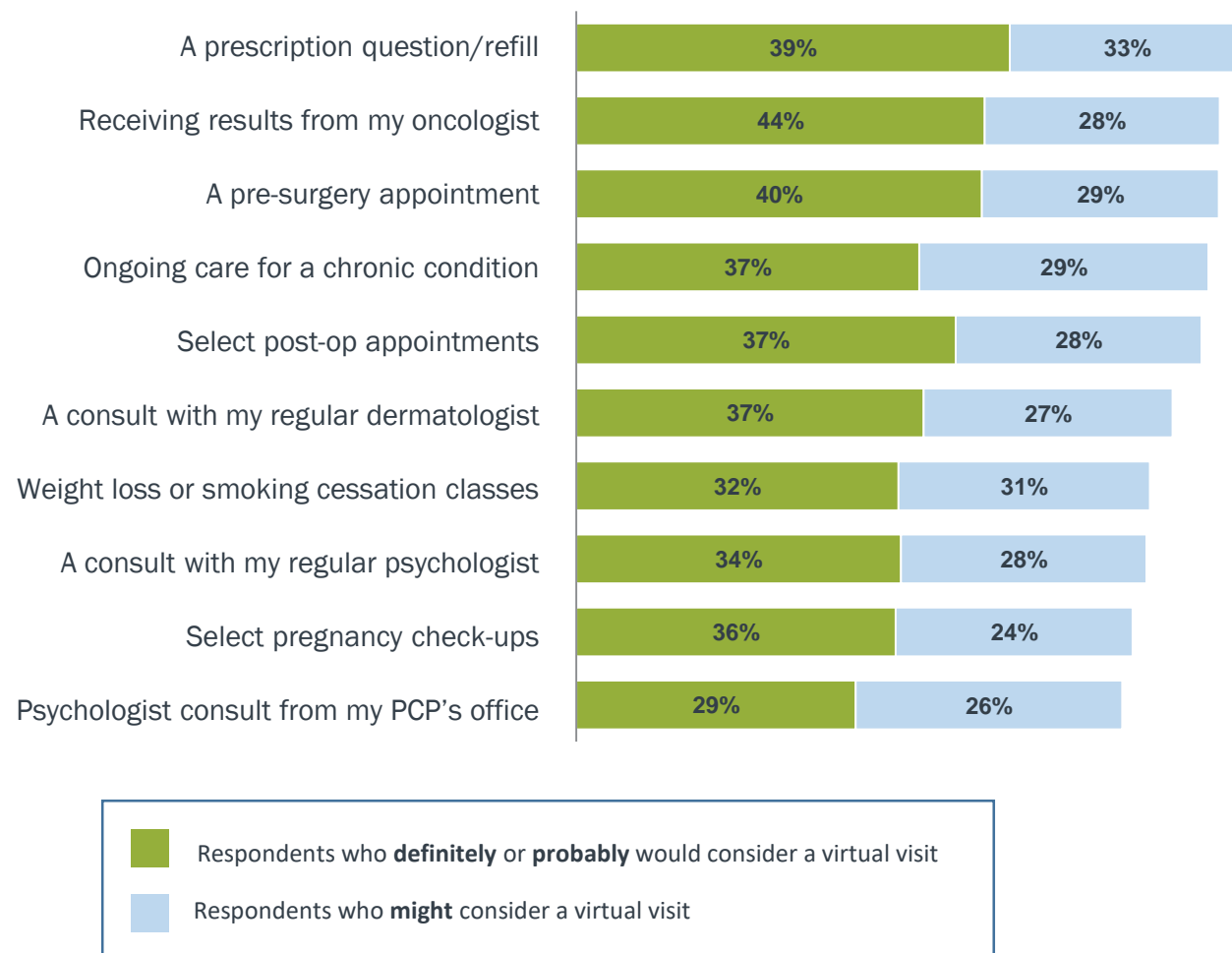
Delivering the Right Care, for the Right Price, at the Right Time – in the Right Place

TELEMEDICINE DRIVERS



CONSUMERISM

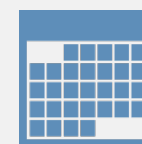
CONSUMERS' TOP 10 VIRTUAL VISIT USE CASES



80% of internet users in the US have searched for health related information online

Pew Research Center

PATIENT VALUE PROPOSITION



Shorter wait times to next appointment



No need to travel for care



Visit in the privacy of home



More frequent and ongoing care



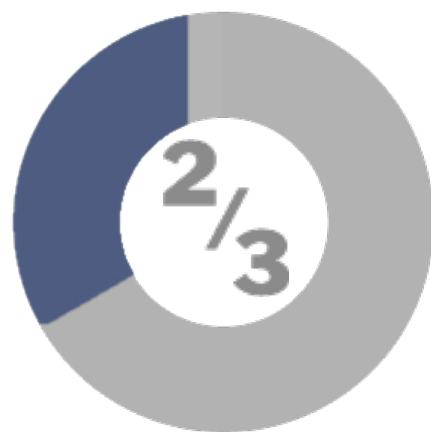
NEARLY ONE HALF
OF ALL AMERICANS SUFFER
FROM AT LEAST ONE
**CHRONIC
DISEASE**

CHRONIC DISEASES

ACCOUNT FOR **\$3** OF EVERY **\$4**



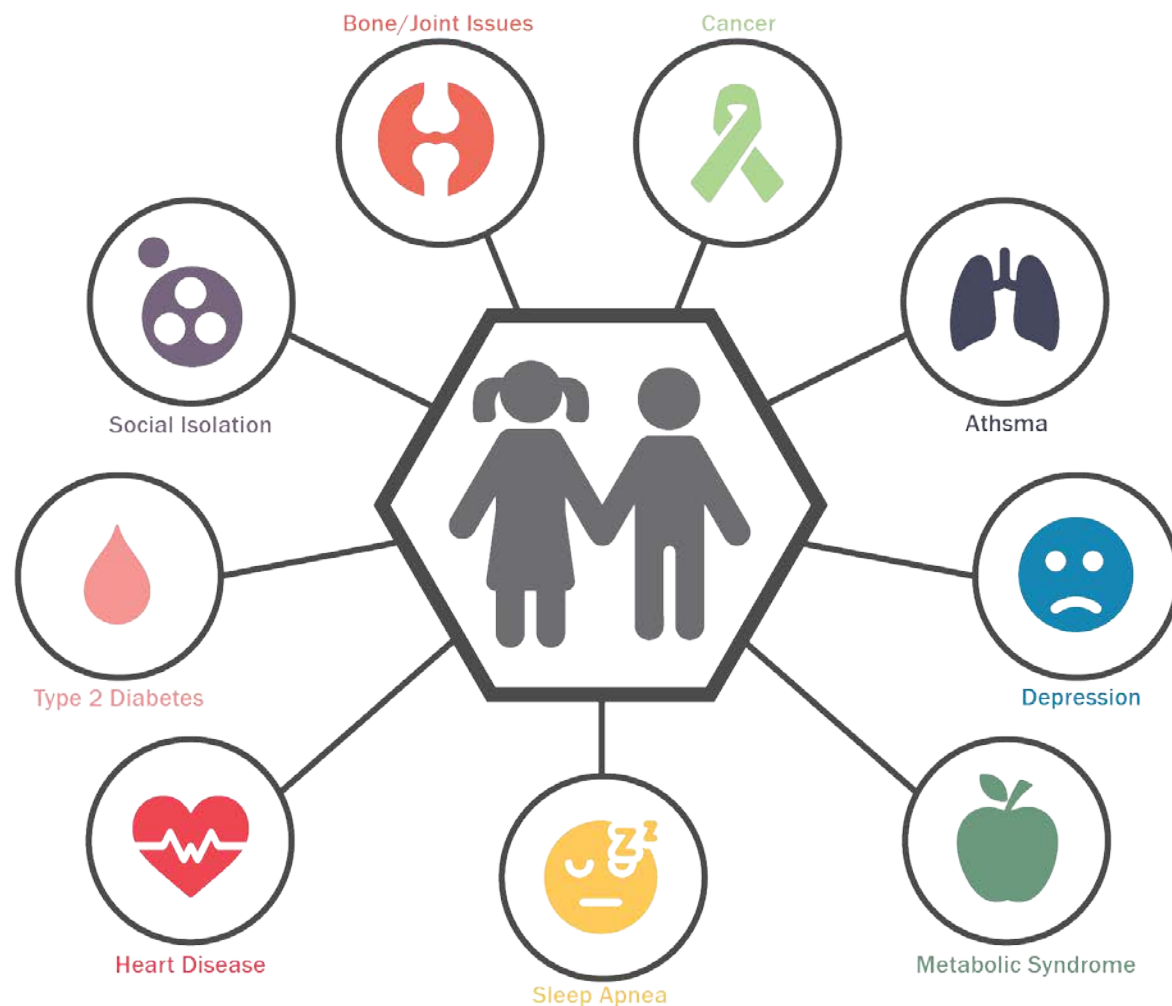
SPENT ON HEALTHCARE



OF **ALL DEATHS** ARE
CAUSED BY ONE OR MORE OF
5 CHRONIC DISEASES

{ HEART DISEASE
CANCER
STROKE
COPD
DIABETES

CHILDHOOD OBESITY



Childhood Obesity Rates have tripled since the 1970's

More likely to be Teased and have Self-Esteem Issues...

More Likely to have Risk of Other Chronic Health Issues for Longer Period of Time...

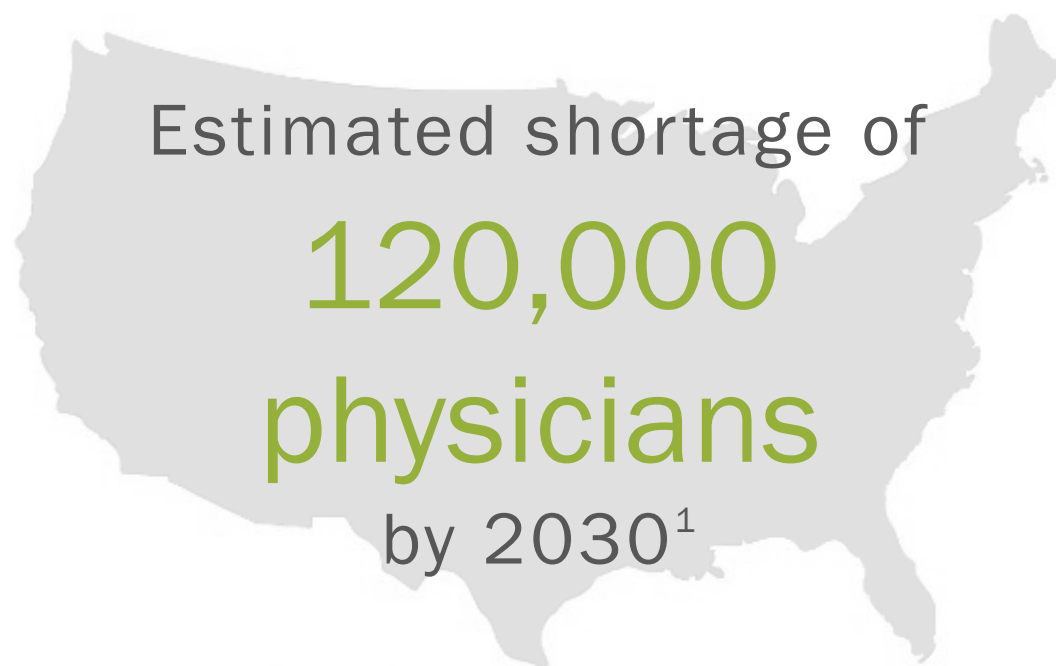
More Likely to be Obese as an Adult with All of the Associated Health Issues...

Just Over 70% Of All Americans Are Either Overweight Or Obese

COORDINATED CARE



PHYSICIAN SHORTAGE



1. Source: Association of American Medical Colleges, "New Research Shows Increasing Physician Shortages in Both Primary and Specialty Care, https://news.aamc.org/press-releases/article/workforce_report_shortage_04112018/, 2018

2. Source: The Telegraph, "Most hospitals and GP practices have shortage of doctors, survey suggests", <https://www.telegraph.co.uk/news/2018/01/23/hospitals-gp-practices-have-shortage-doctors-survey-suggests/>, 2018

RISING NUMBERS OF NOMADIC WORKERS

Remote Workers Represent **43%** of Employed Americans; 66M People

Gallop 2016 Survey 15,000 Adults²

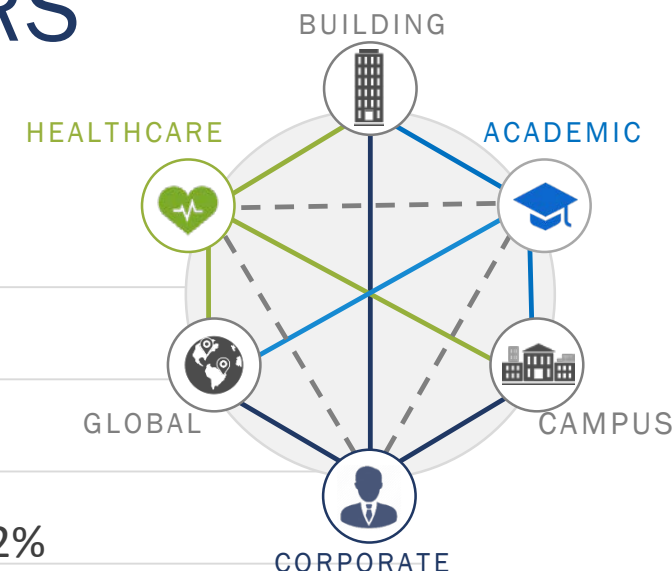
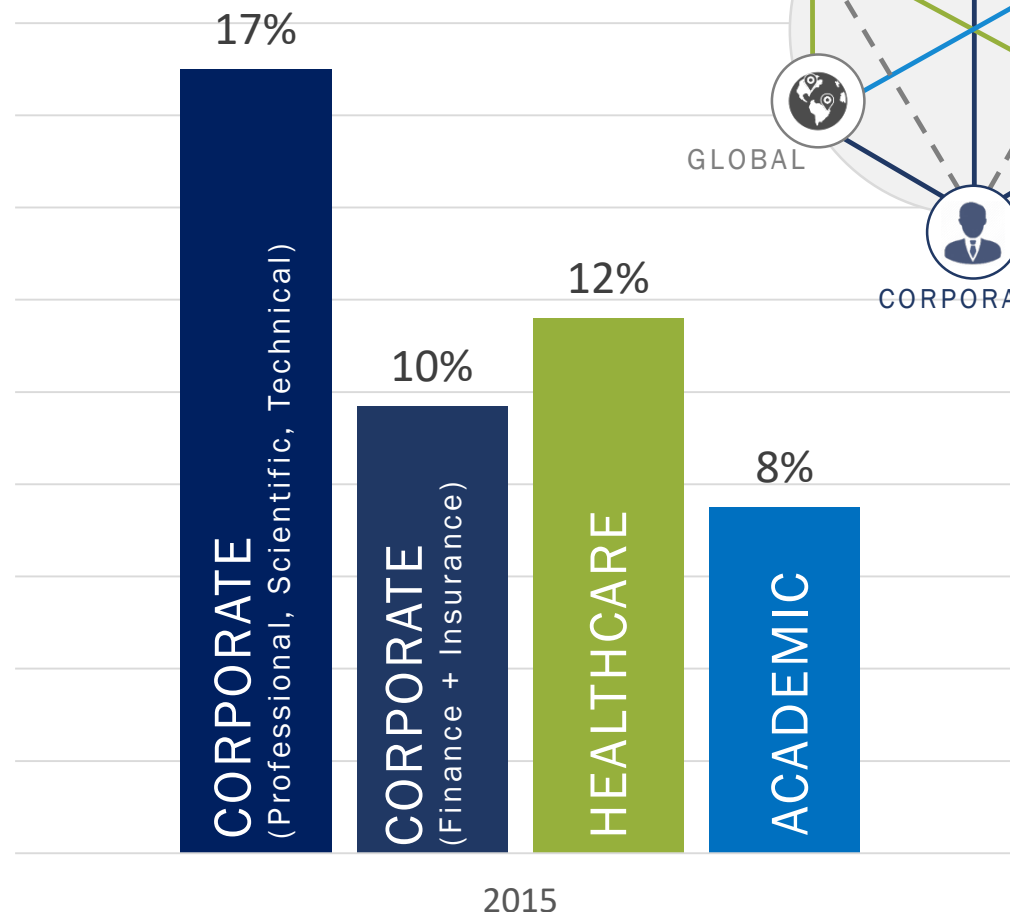
“There Will Be 1 Billion Nomads By 2035”

Peter Levels, “The future of digital nomads”¹



Workplace is an occasional anchor point rather than a daily travel destination

REMOTE WORK ACROSS INDUSTRIES



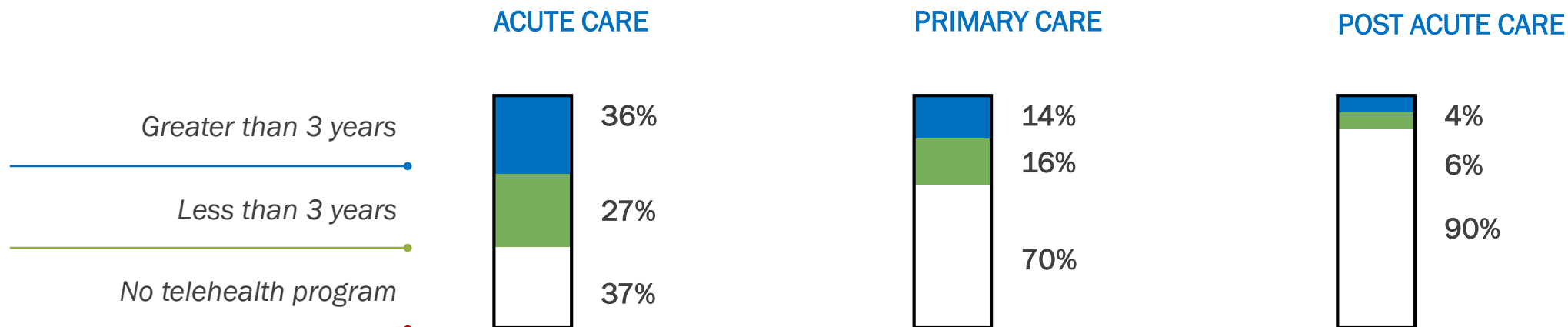
1. Source: Peter Levels, “The future of digital nomads: How remote work will transform the world in the next 20 years”, 2015, <https://levels.io/future-of-digital-nomads/>

2. Source: “State of the American Workplace”, 2017, Gallup, Inc

3. Source: Special analysis of U.S. Census data conducted for FlexJobs by Global Workplace Analytics

TELEMEDICINE ADOPTION

TELEHEALTH PROGRAM MATURITY, BY CARE SETTING



TOP SPECIALTY APPLICATIONS



Stroke



Psychiatry



Neurology



Radiology



Pediatrics

WHAT IS TELEMEDICINE?

WORLD HEALTH ORGANIZATION FINDINGS

Telemedicine **overcomes geographical barriers** and increases access to health care services

Telemedicine has the potential to provide **accessible, cost-effective, high-quality health care** services in both developed and developing countries

Approximately **30%** of responding countries have a national **agency for the promotion and development of telemedicine**

Developing countries are as likely as developed countries to have such an agency



World Health
Organization

NEW ADVANCES IN TELEMEDICINE

Patient-to-Provider



E-visits



Wearables



Secure messaging



Provider-to-Provider



E-consults

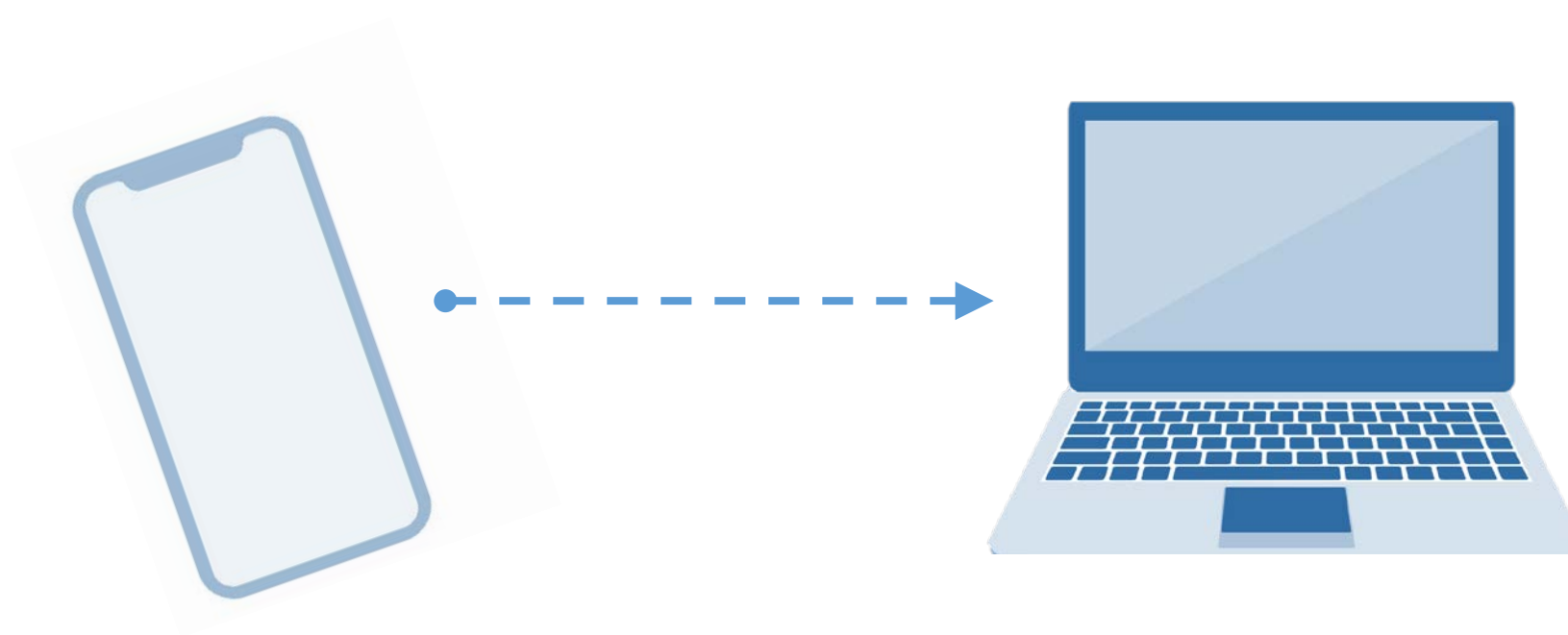


Implantables

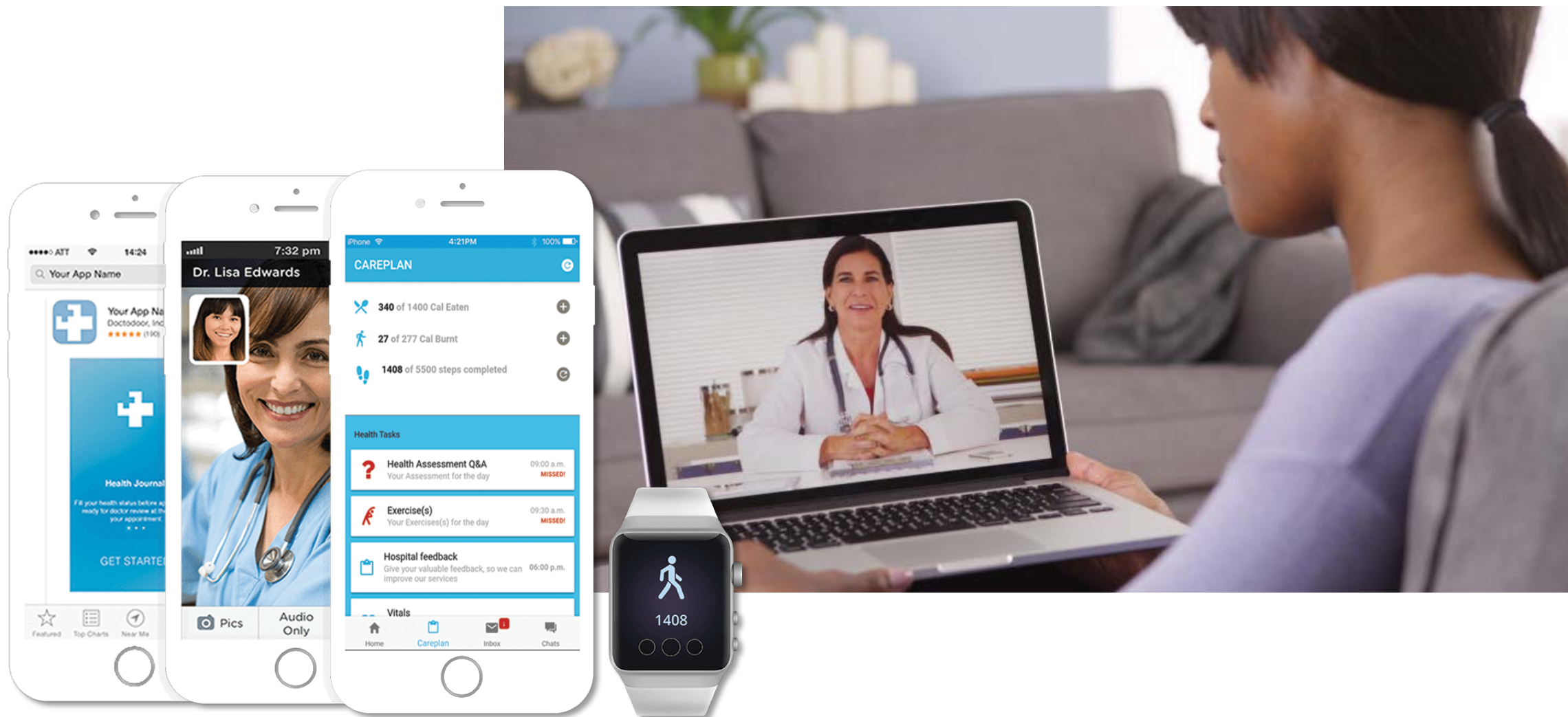


Second opinion consults

PATIENT-TO-PROVIDER



VIRTUAL VISIT



Who Has Used Virtual Visits Before?

EARLY ADOPTERS ARE YOUNG, URBAN, WEALTHIER, AND PRIVATELY INSURED

WHO HAS USED A VIRTUAL VISIT BEFORE?

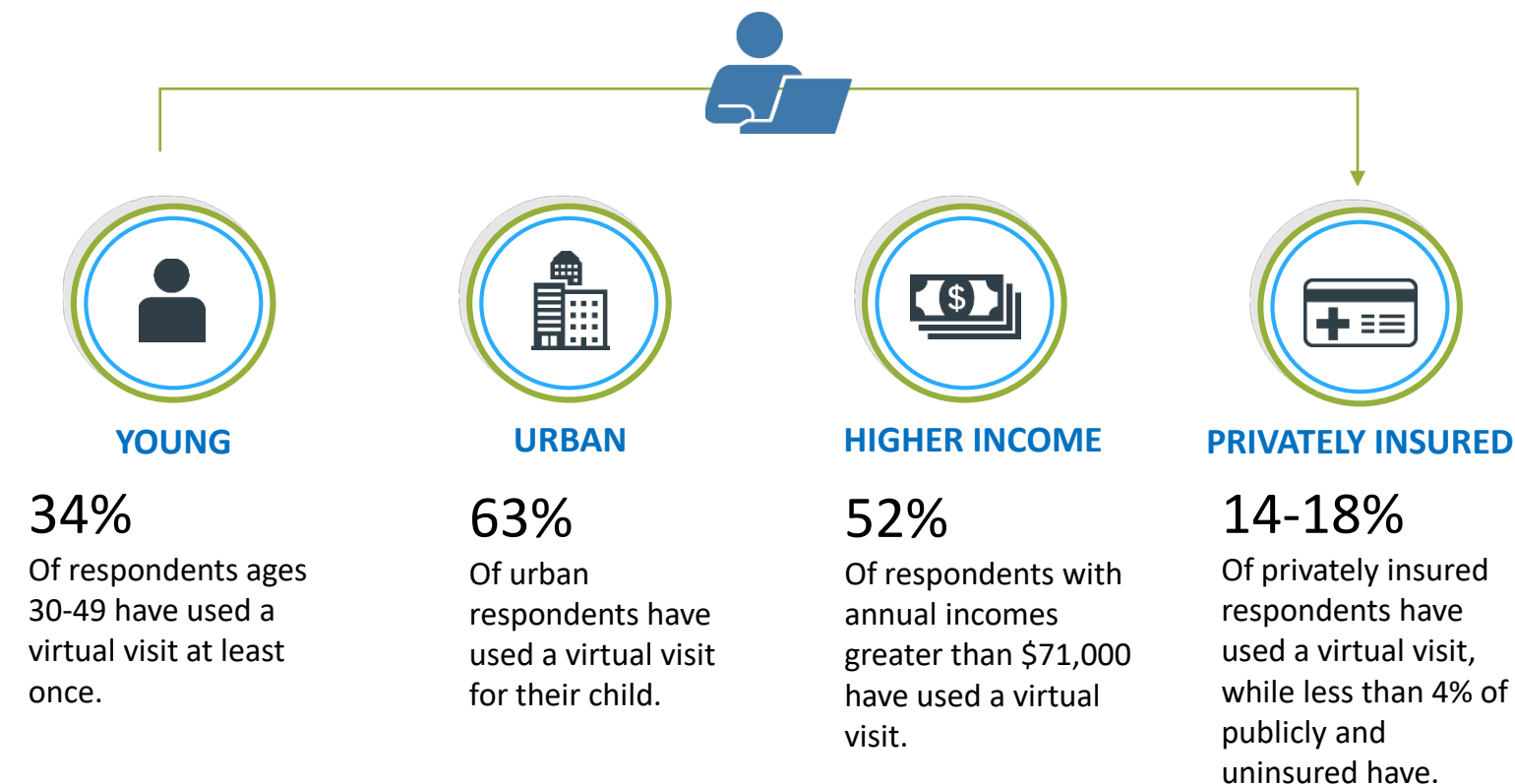
19%

Of respondents reported having used at least one virtual visit before

39%

Of parents reported having used a virtual visit for their child

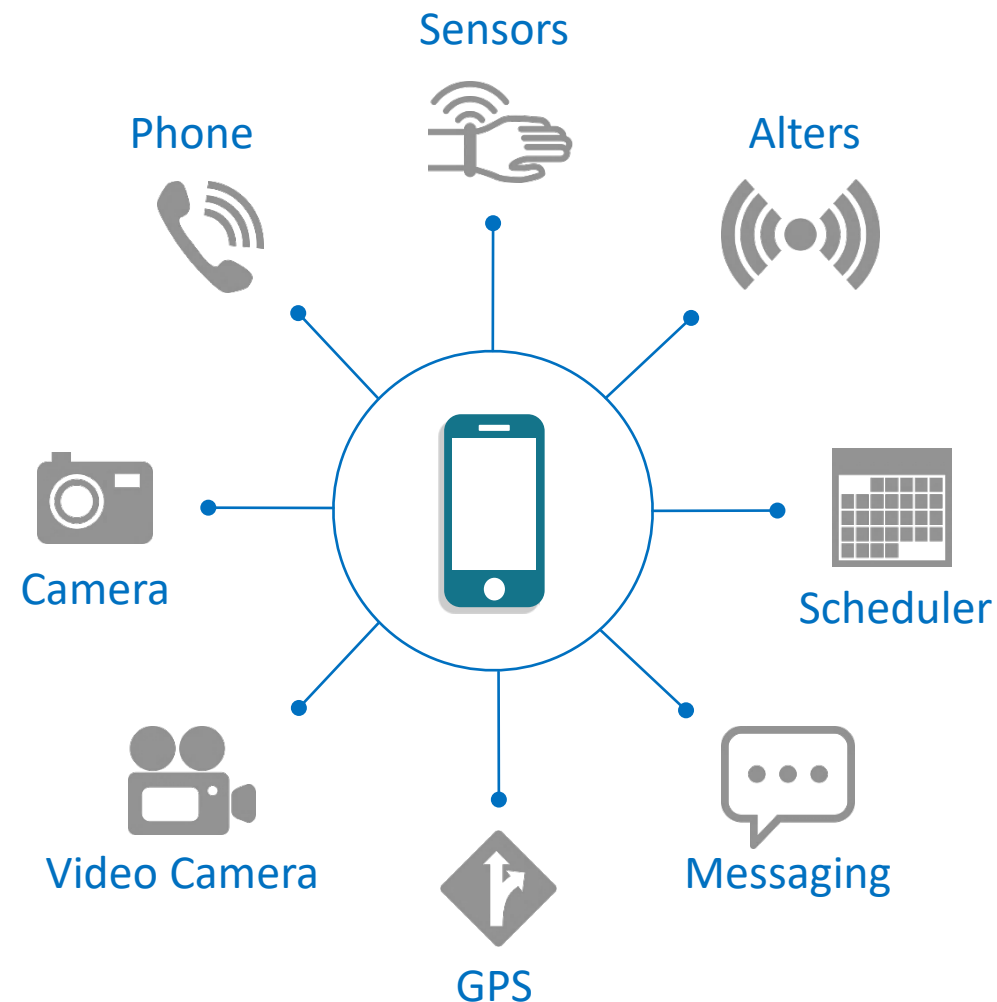
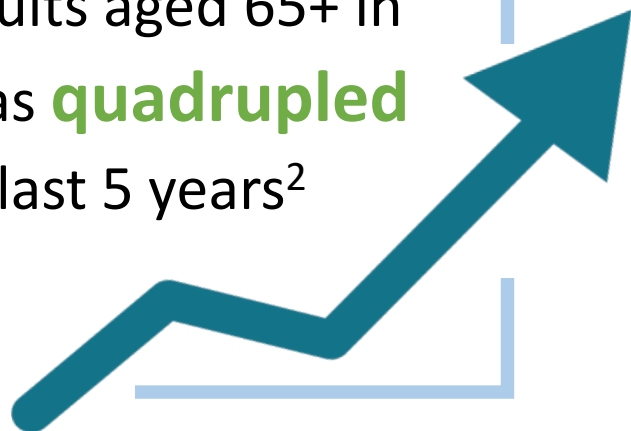
VIRTUAL VISIT USER CHARACTERISTICS



Bring Your Own Device

Powerful Health Tools that Most Patients Already Own

Smartphone adoption
among adults aged 65+ in
the U.S. has **quadrupled**
in the last 5 years²



CHRONIC CARE MANAGEMENT

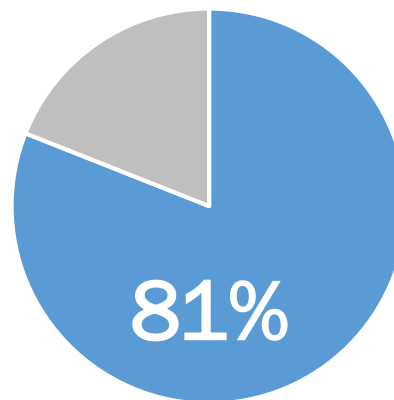
Better managing chronic care results in improved quality of life for patients

“Pillbox sensors” that track compliance and communicate providers may improve chronic care management

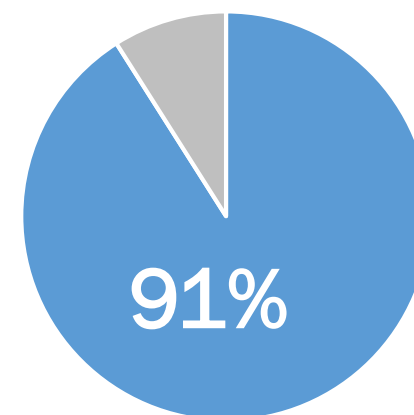


Poor medication adherence is estimated to cause as much as
\$290 billion
a year in higher US medical costs

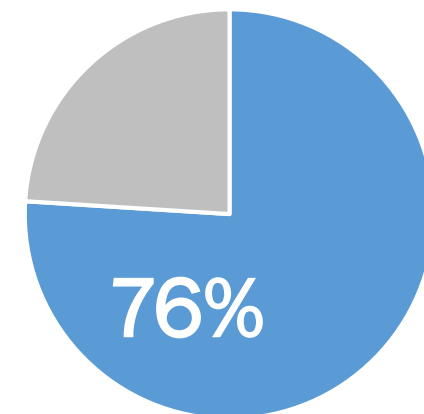
PEOPLE WITH CHRONIC CONDITIONS ACCOUNT FOR:



of hospital admissions

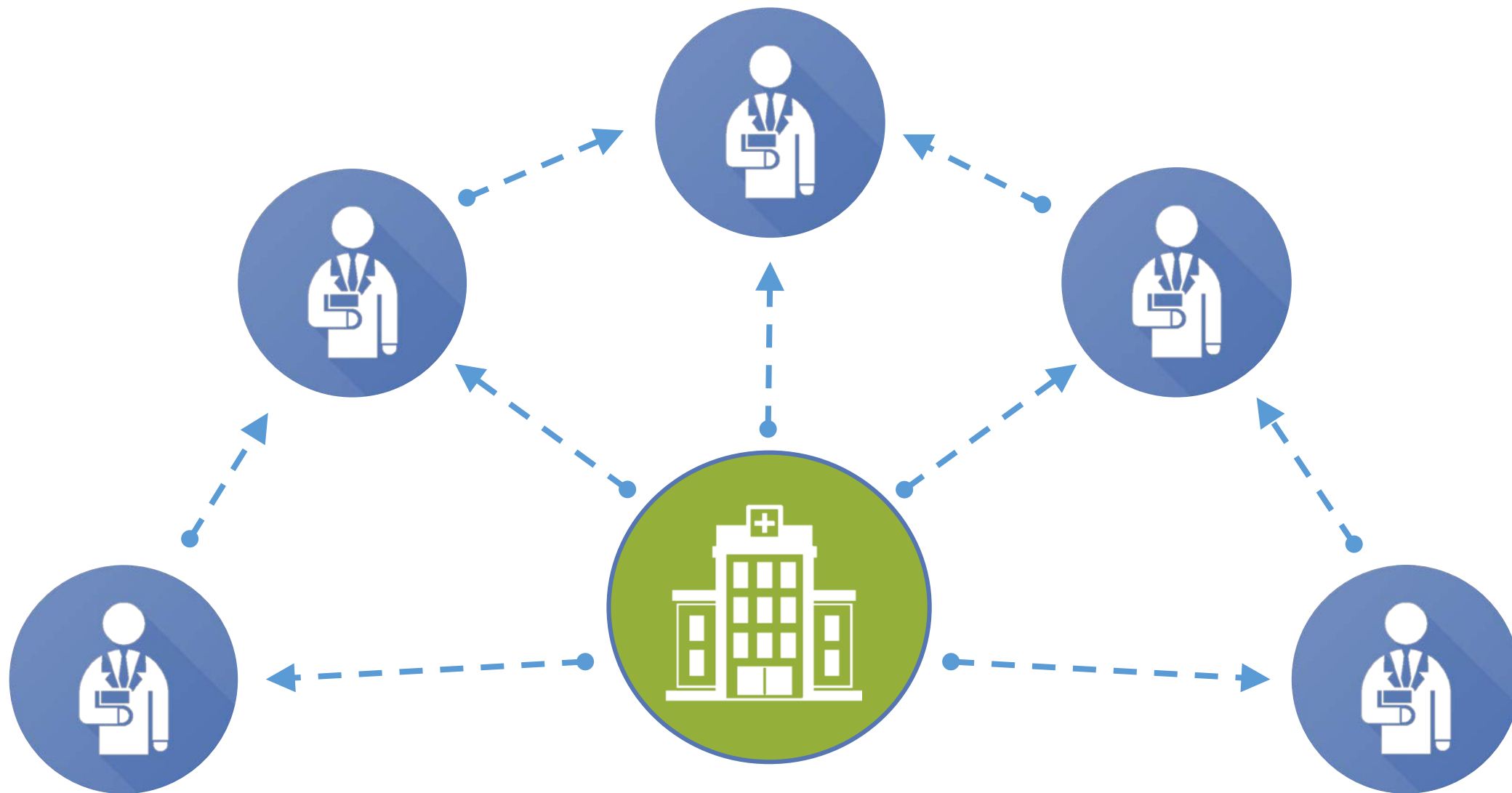


of all prescriptions filled



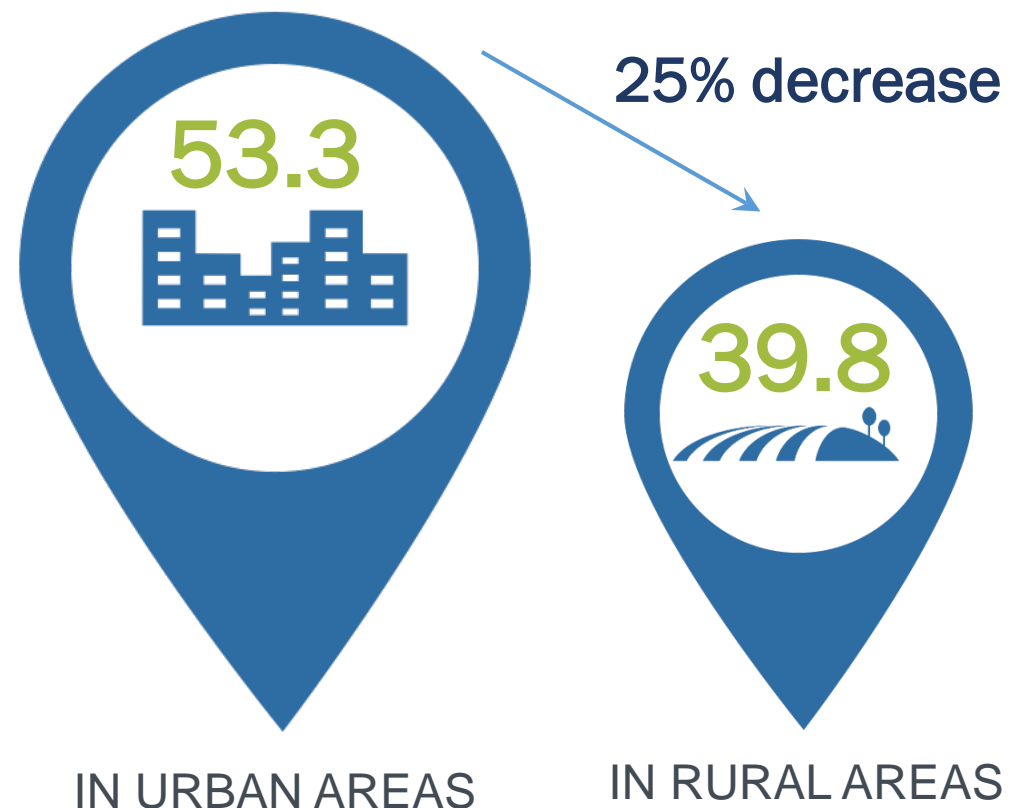
of all physician visits

PROVIDER-TO-PROVIDER



ACCESS TO SPECIALISTS

THE PATIENT-TO-PRIMARY CARE PHYSICIAN RATIO, PER 100,000 PHYSICIANS IS:



Between 2005 and 2016,
118 rural US hospitals
closed permanently

“Access to providers, even family physicians, is a problem. If you want to go to an OB/GYN, depending on where you live in the country, you may have to go 200 miles.”

Gary Hart, PhD
University of North Dakota School of Medicine and Health Sciences

OPPORTUNITIES FOR CLINICIAN ENGAGEMENT



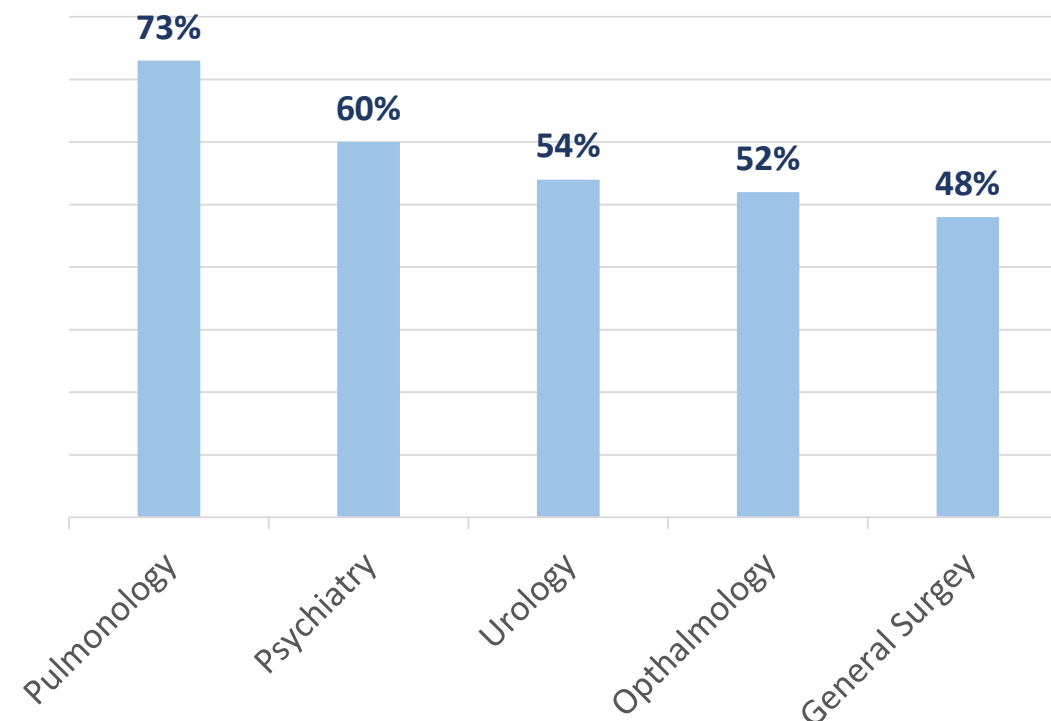
The reduced physical demands of telehealth work might prolong the careers of knowledgeable physicians who might otherwise retire.

43%

OF US PHYSICIANS ARE
55 YEARS OLD OR OLDER








Percent of US Physicians 55 or Older



WHERE IS TELEMEDICINE?

TELEMEDICINE EXAMPLES

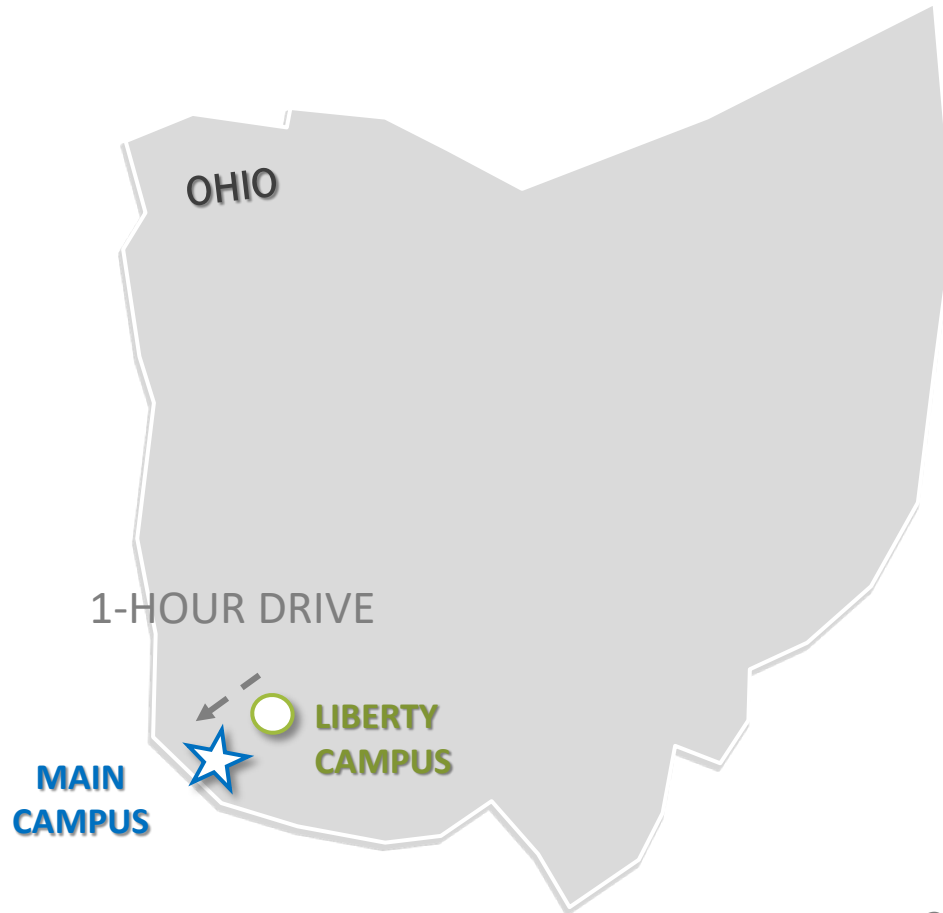
	INPATIENT 	OUTPATIENT/ SPECIALTY 	PRIMARY CARE 	EMERGENCY 	POST-ACUTE/ CHRONIC CARE 
PATIENT:	Fixed	Fixed or Mobile	Fixed or Mobile	Fixed or Mobile	Fixed or Mobile
CLINICIAN:	Fixed or Mobile	Mobile	Mobile	Fixed or Mobile	Mobile



INPATIENT

CINCINNATI CHILDREN'S HOSPITAL

BALLINGER



22 Miles (35.4 km)

SAME DISTANCE AS NICE TO CANNES, FRANCE



INPATIENT

CINCINNATI CHILDREN'S HOSPITAL

BALLINGER

100% of patient rooms at the Liberty Campus are telemedicine capable

Cincinnati Children's Telehealth Network
lends expertise to providers around the world

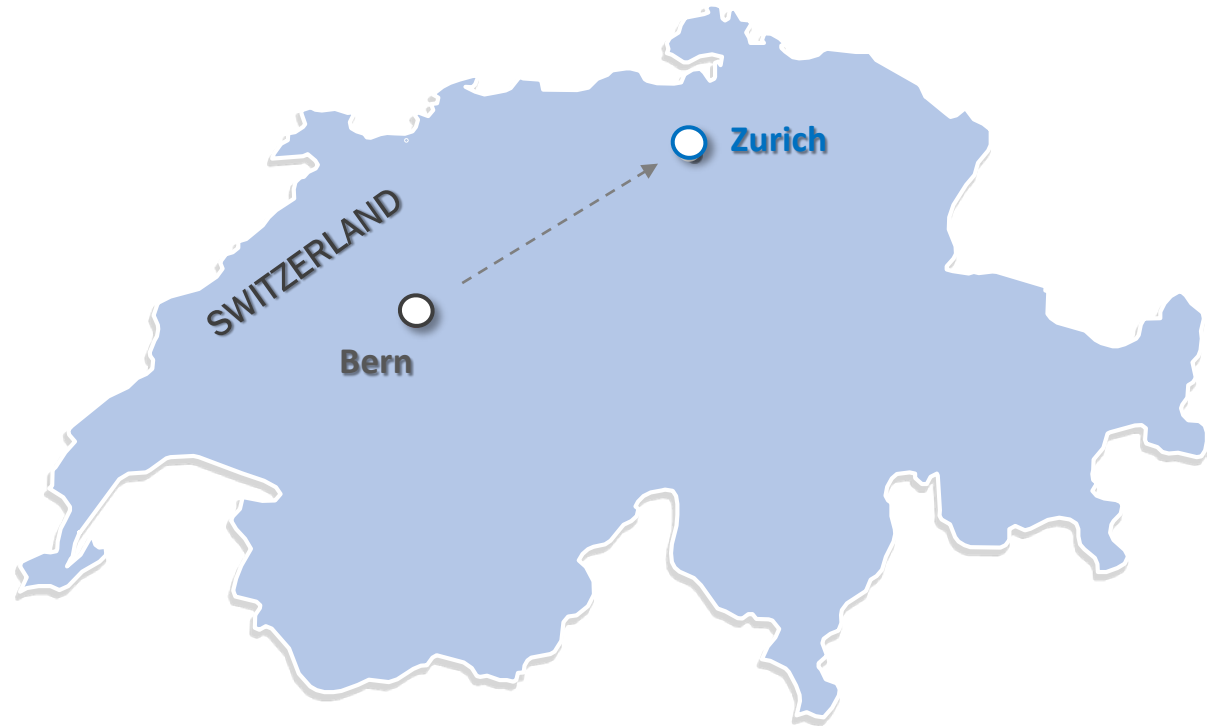




OUTPATIENT / SPECIALTY

ANN B. BARSHINGER CANCER INSTITUTE

BALLINGER



80 Miles (128.7 km)

SAME DISTANCE AS ZÜRICH TO BERN SWITZERLAND



OUTPATIENT / SPECIALTY

ANN B. BARSHINGER CANCER INSTITUTE

Multidisciplinary clinic

5 neighborhoods

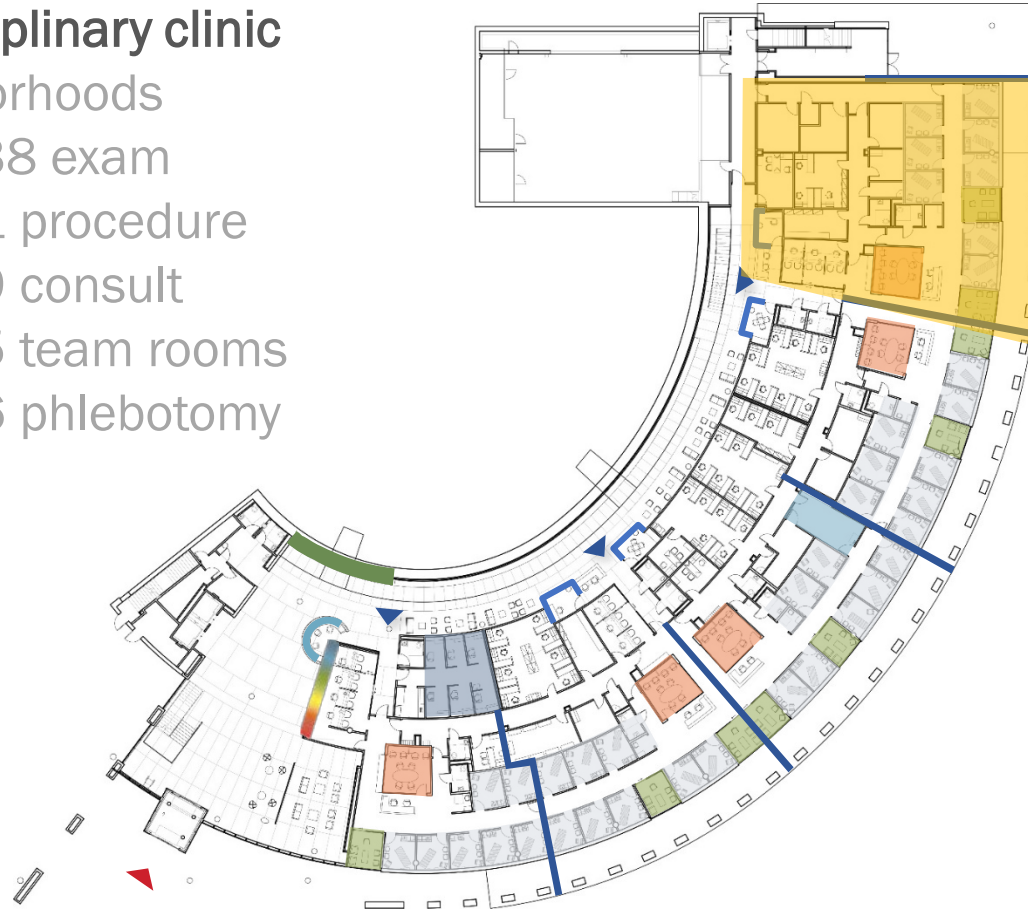
38 exam

1 procedure

9 consult

5 team rooms

6 phlebotomy

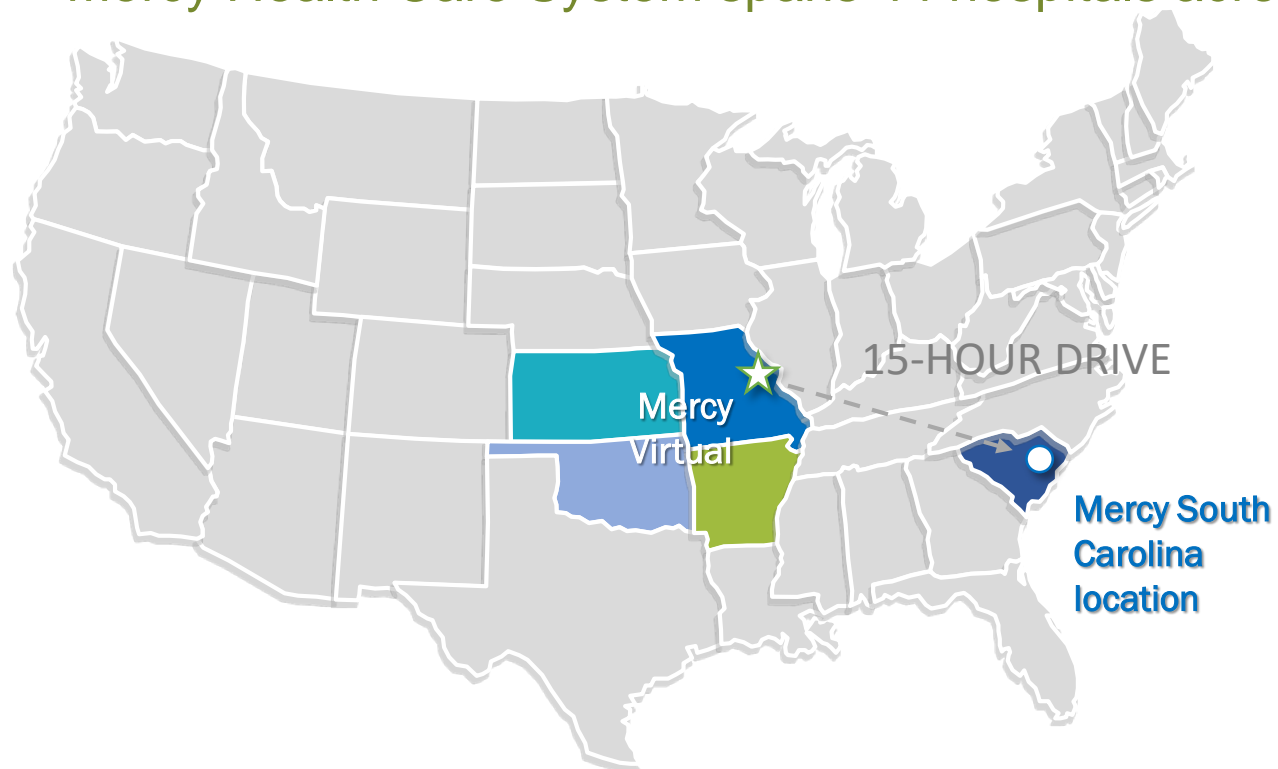




PRIMARY CARE +

MERCY VIRTUAL

Mercy Health Care System spans 44 hospitals across 5 states



843 Miles (1,356.7 km)

SAME DISTANCE AS AMSTERDAM, THE NETHERLANDS TO FLORENCE, ITALY



PRIMARY CARE +

MERCY VIRTUAL

In the United States, only **1** out of **10** U.S. doctors practice in rural areas, while nearly **1** in **4** Americans live in these areas

SERVICES:

- Mercy SafeWatch (ICU)
- Home Monitoring
- Nurse-On-Call
- Telestroke



330 specialized medical professionals available 24/7/365

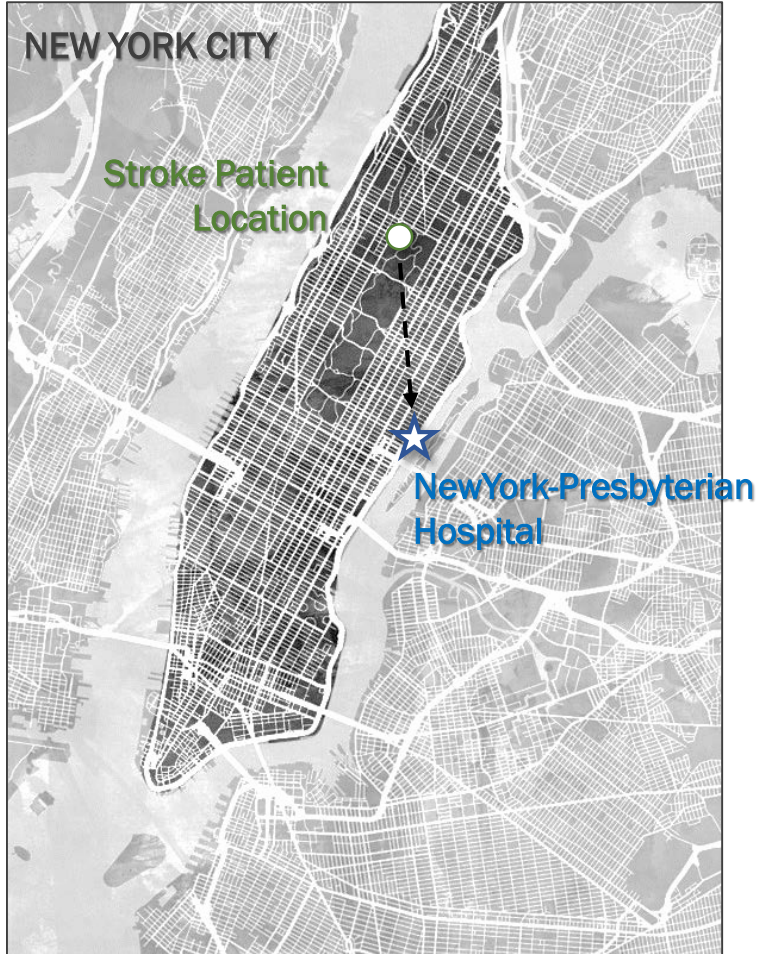




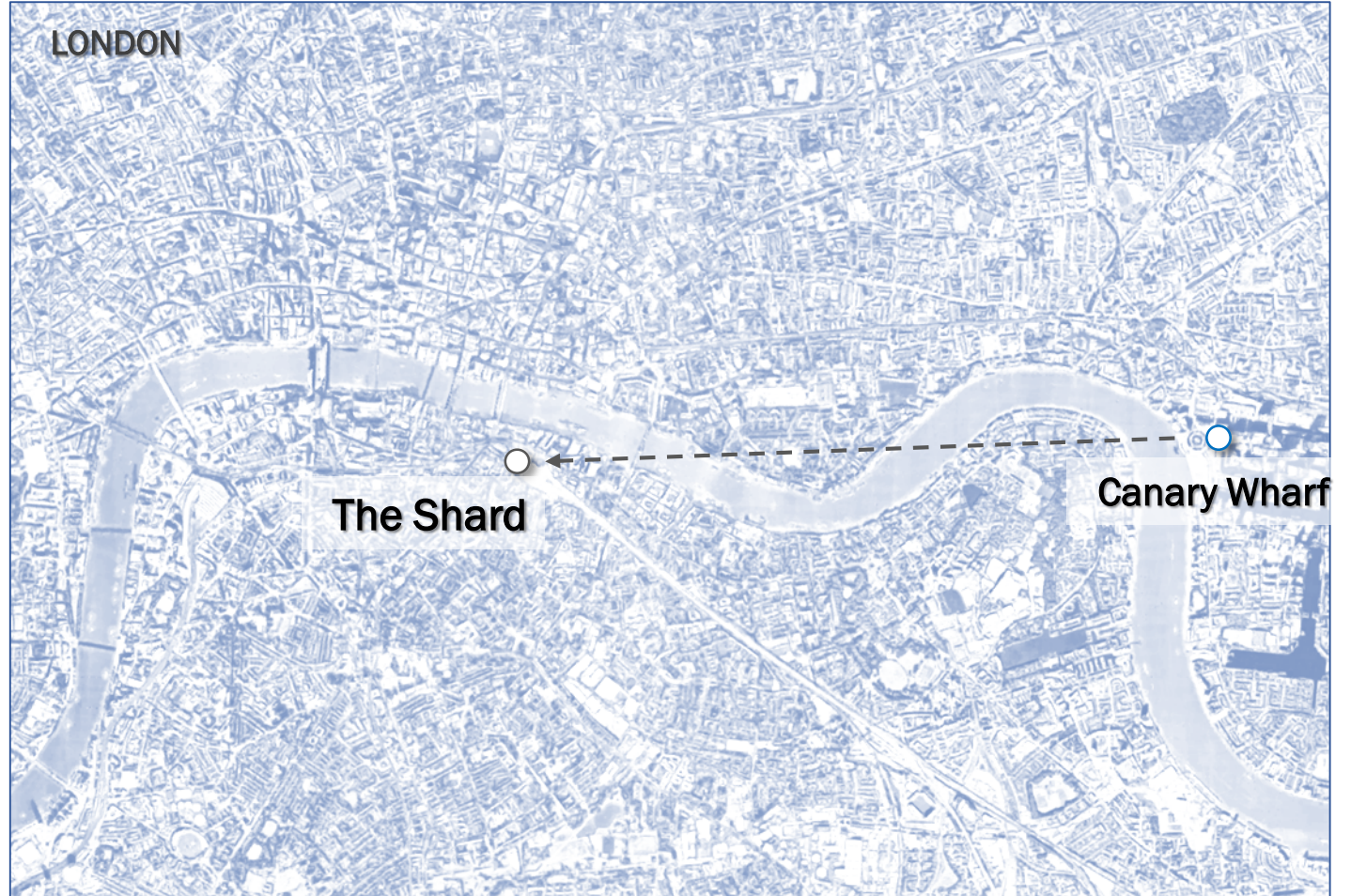
EMERGENCY

NEWYORK-PRESBYTERIAN HOSPITAL

BALLINGER



30-MINUTE DRIVE



3.5 Miles (5.6 km)

SAME DISTANCE AS CANARY WHARF TO THE SHARD



EMERGENCY

NEWYORK-PRESBYTERIAN HOSPITAL

The Mobile Stroke Treatment Unit allows **1 neurologist** to oversee care on **multiple ambulances**

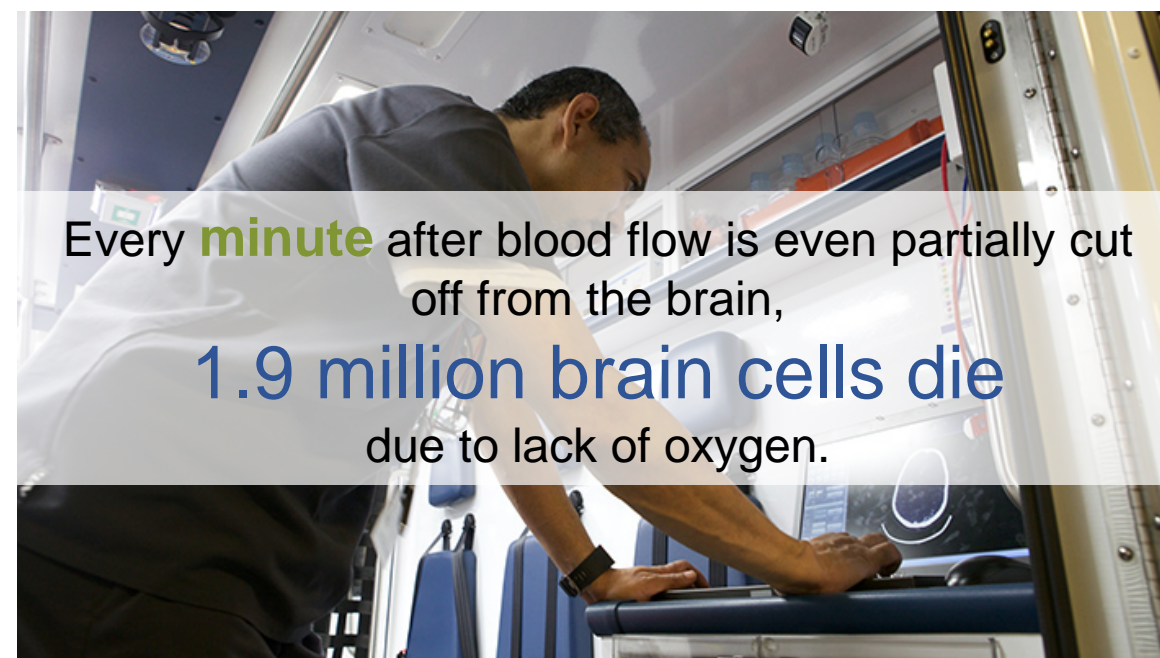


Microphone and speakers for audio transmission between ambulance and neurologist

Adjustable camera with high-def imaging for neurologist to view patient



	Traditional Ambulance	Mobile Stroke Treatment Ambulance
Access to Neurologist	X	✓
Confirmed Diagnosis of Stroke	X	✓
Advanced Stroke Care Medications	X	✓



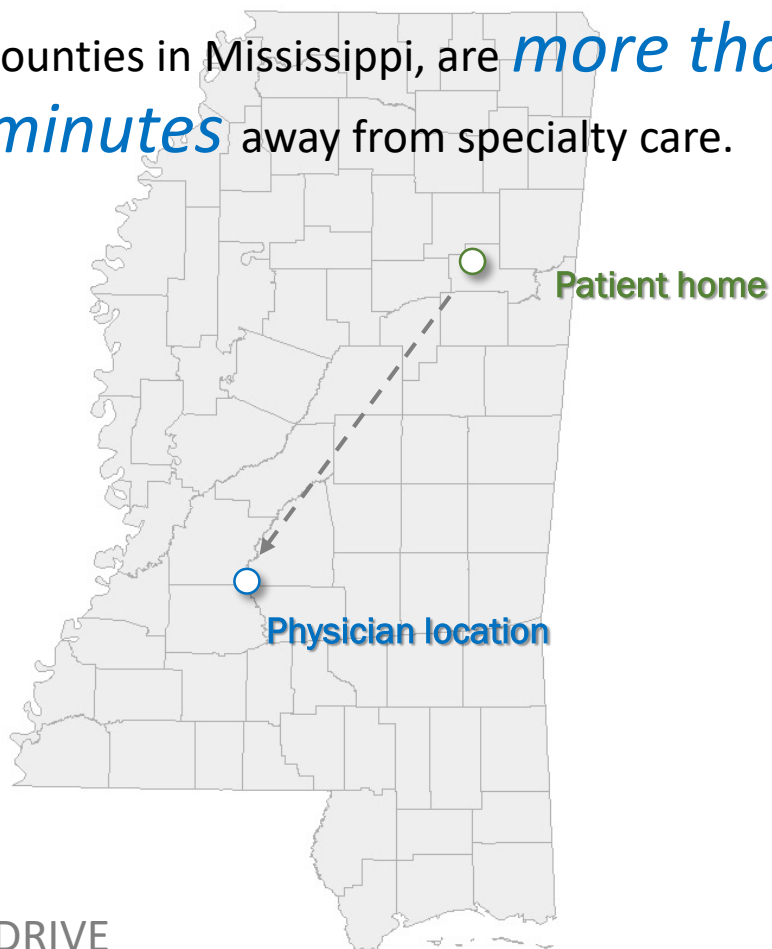
Every **minute** after blood flow is even partially cut off from the brain,
1.9 million brain cells die
 due to lack of oxygen.



POST-ACUTE / CHRONIC CARE

UNIVERSITY OF MISSISSIPPI MEDICAL CENTER, CENTER FOR TELEHEALTH

65% counties in Mississippi, are *more than 40 minutes* away from specialty care.



2.5-HOUR DRIVE

125 Miles (201 km)

SAME DISTANCE AS LONDON TO BIRMINGHAM





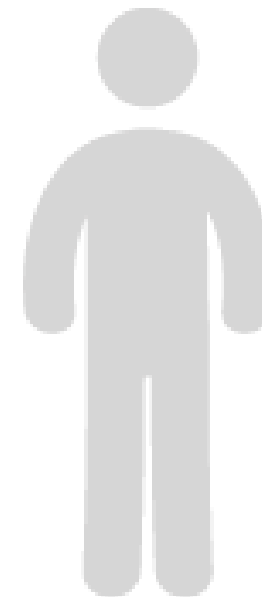
UNIVERSITY OF MISSISSIPPI MEDICAL CENTER

DIABETES CARE CENTER



Mississippi had the *highest %* of adults diagnosed with **diabetes** in 2010

In 2012, Mississippi spent **\$2.74 billion** on diabetes-related medical expenses



100

Study Participants
with Diabetes
Across Mississippi



POST-ACUTE / CHRONIC CARE

UNIVERSITY OF MISSISSIPPI MEDICAL CENTER, CENTER FOR TELEHEALTH

RESULTS:

0 participants *were hospitalized or visited an emergency room*, saving payers **\$339,184**

Participant medication compliance reached **96%**

Participants saved **9,454 miles** of driving to specialists

Health session participation reached **83%**

Participant mean hemoglobin A1c levels decreased by **1.7%**



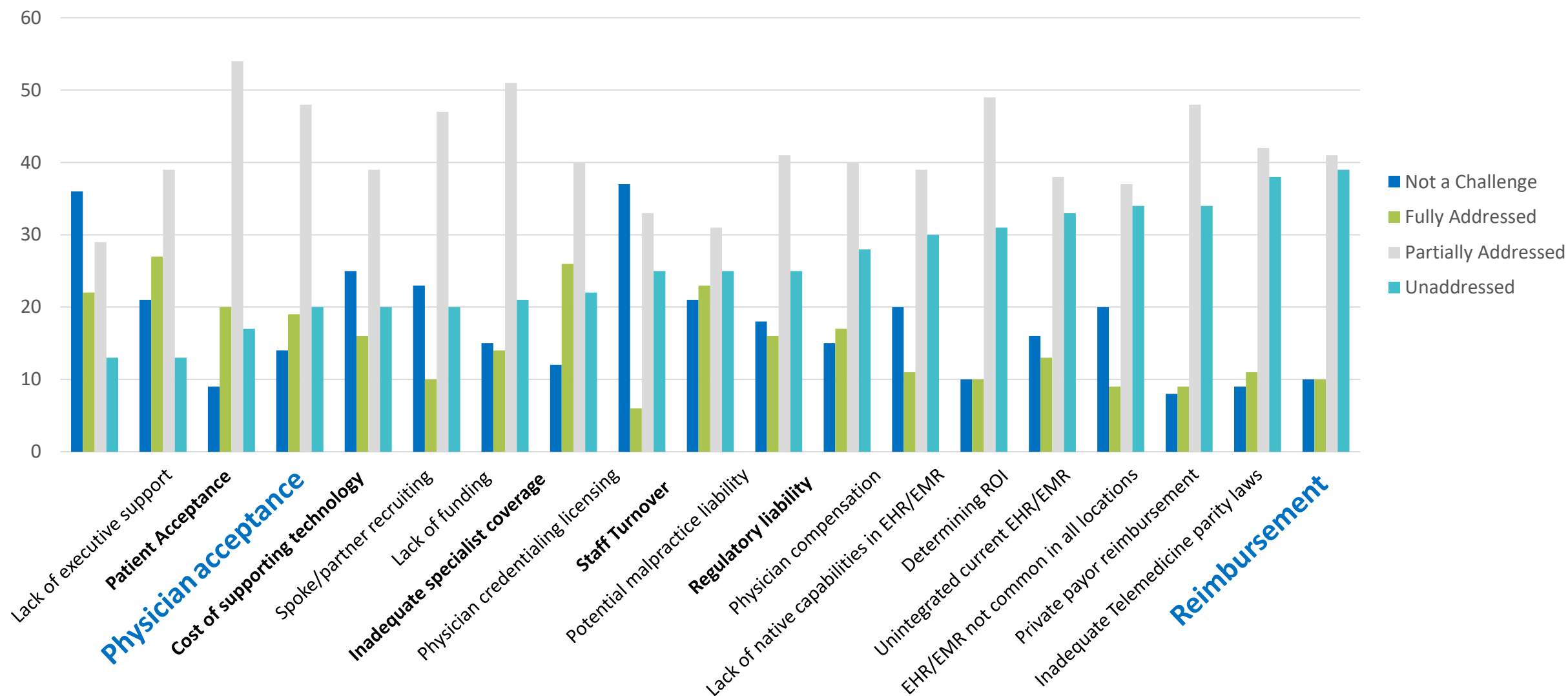
Mississippi is estimated to save approximately **\$189 million/year**

Reimbursement for remote monitoring is set at **\$16/day** or \$480 monthly

CHALLENGES

The image features a large, light blue circle on the left containing the word "CHALLENGES" in a dark blue, sans-serif font. To its right is a smaller, light blue circle. Below the large circle is a medium-sized, light green circle. The background is white and decorated with several curved lines: a thin green line starting from the top left and curving towards the top right; a thick blue line starting from the bottom left and curving towards the bottom right; a thick green line starting from the bottom right and curving towards the top right; and a thin blue line starting from the bottom left and curving towards the bottom right.

TELEMEDICINE PROGRAM CHALLENGES



PRIVACY LAWS



General Data Protection Regulation (GDPR)

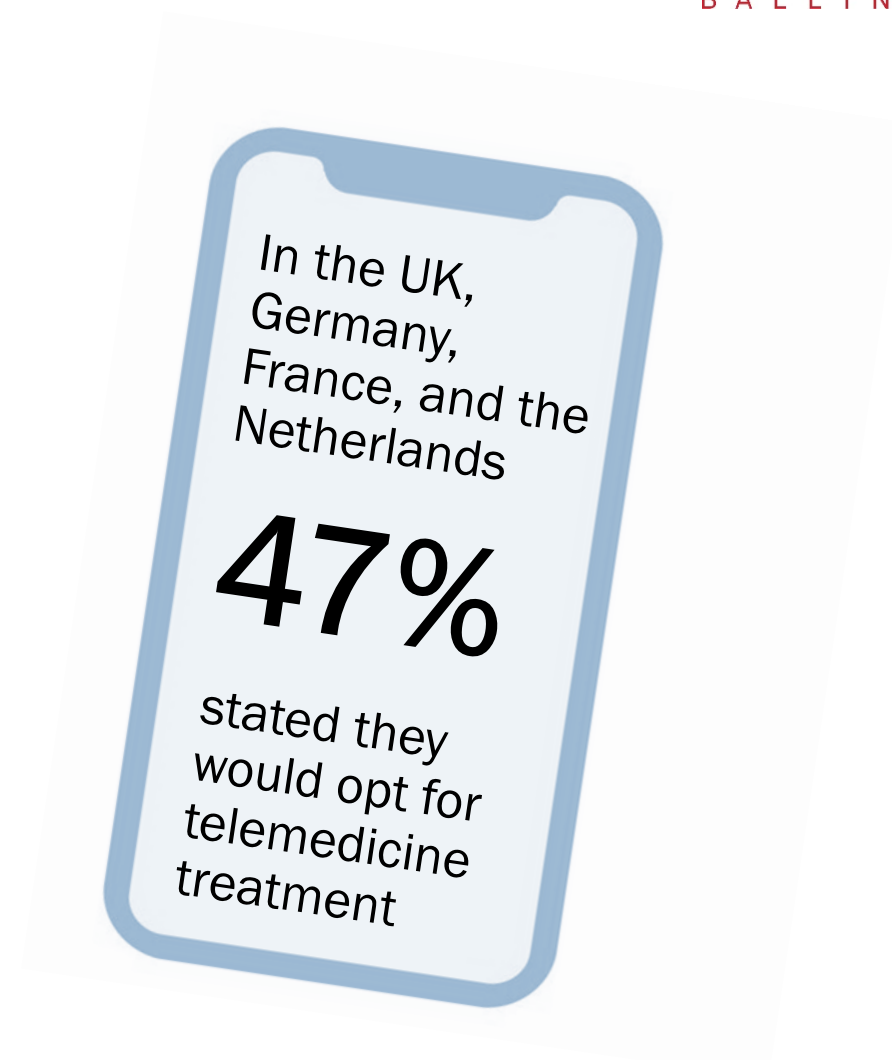
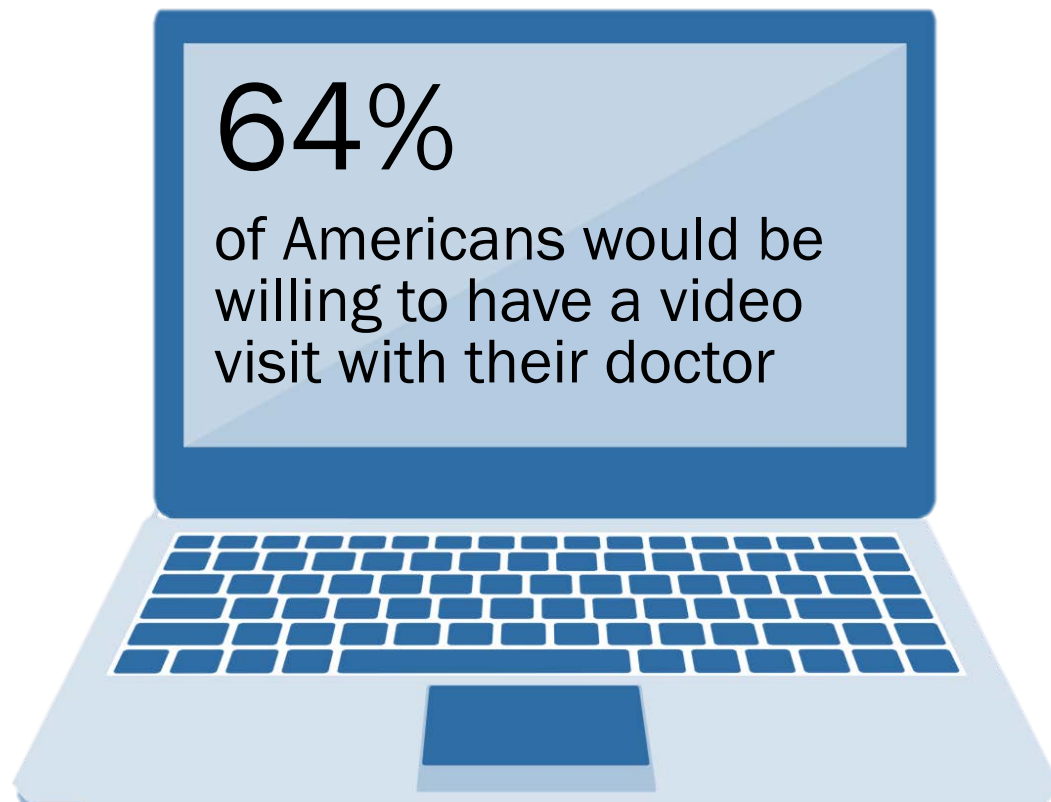
Legal framework for the collection and processing of personal information of individuals within the EU. It sets out the principles for data management and the rights of the individual.



Health Insurance Portability and Accountability Act (HIPPA)

US law designed to provide privacy standards to protect patients' medical records and other health information provided to health plans, doctors, hospitals and other health care providers

PATIENT PREFERENCES



According to healthcare futurist Nicholas Webb, 50% of clinical visits are moving to the digital realm because only 10-15% of exams need physical exams

ACCESS TO TECHNOLOGY



53%

OF RURAL AMERICANS LACK
HIGH-SPEED INTERNET ACCESS

THE US STATE OF MISSISSIPI'S
SOLUTION WAS TO PROVIDE
FREE BROADBAND INTERNET
FROM CSPIRE

HUMANIZING TELEMEDICINE



SMARTPHONE +
WEARABLE SENSORS



AI+ MACHINE
LEARNING



INGESTIBLE
SENSORS

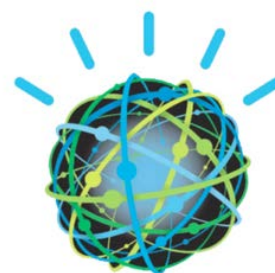


VR + AUGMENTED
REALITY

EMERGING

“Ultimately healthcare comes down to **human-to-human interaction**. So if you are going to go into **artificial intelligence, machine learning**, etc., it’s got to be able to **re-humanize**, as opposed to de-humanize care.”

Dr. Stephan Cowin
CEO, New York Presbyterian



IBM WATSON



HOPE FOR HEALTHCARE

“Yes, we need the *science*. Yes, we need the Spock-type *intelligence*. And yes we need great *management* skills.

But **what will allow us to escape the vortex of America's distributive model** of pharma, insurers, providers all fighting with each other over money, is **not necessarily going to be logic**.

It's going to be ***bold, creative and maybe disruptive*** approaches to figuring out the cost, access, patient experience and quality **issues we now face.”**

Stephen Klasko
President and CEO, Thomas Jefferson University



The image features a large, light green circle on the left side, which serves as a background for the text. To its right is a smaller, dark blue circle. Below the green circle is a medium-sized, light blue circle. The bottom of the image is decorated with a solid blue horizontal band. On the right side, there are several curved lines in green, blue, and dark blue that sweep upwards and outwards. The text "THANK YOU" is centered within the large green circle in a dark blue, sans-serif font.

THANK YOU