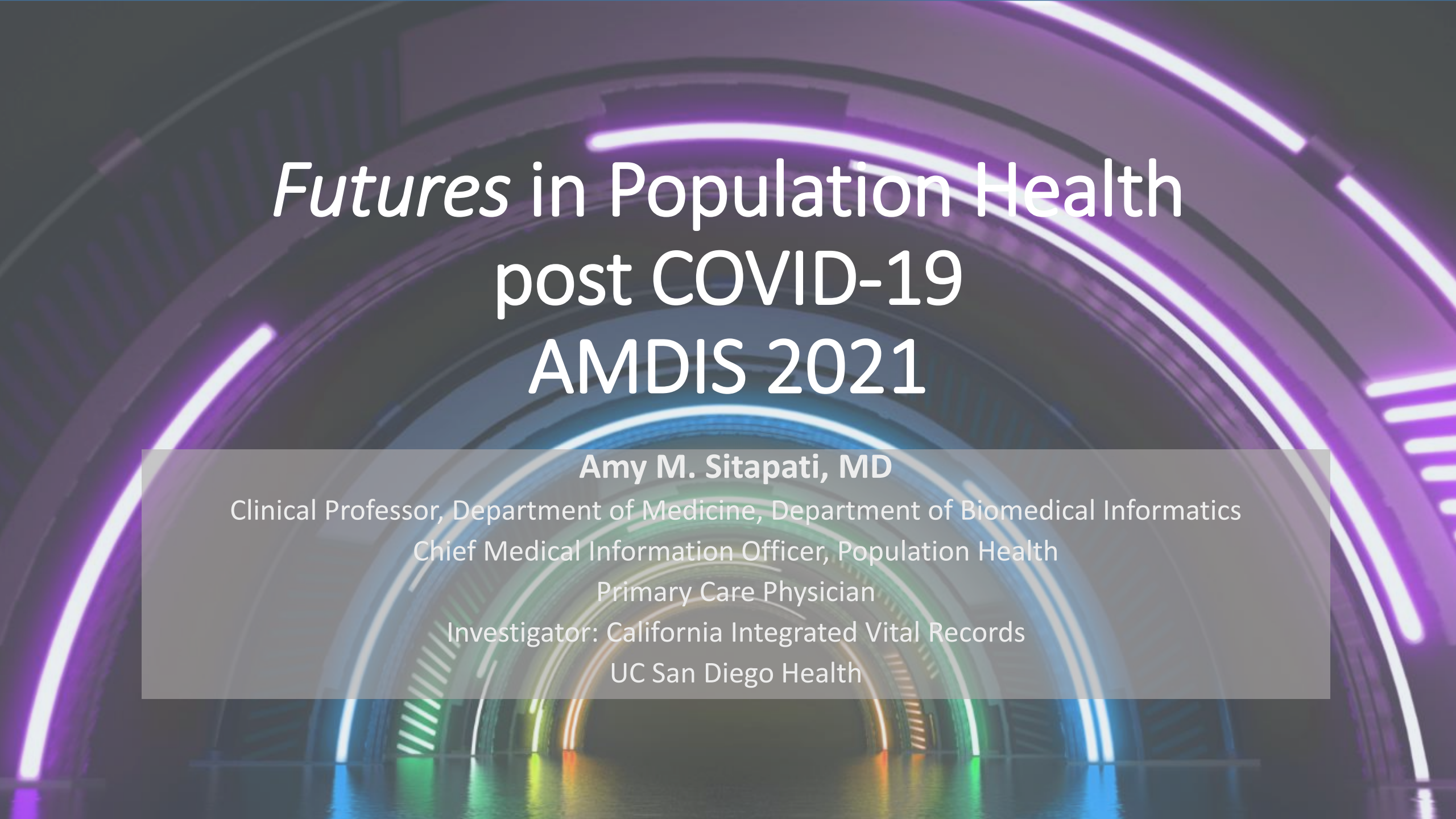


Futures in Population Health post COVID-19 AMDIS 2021

Amy M. Sitapati, MD

Clinical Professor, Department of Medicine, Department of Biomedical Informatics

Chief Medical Information Officer, Population Health

Primary Care Physician

Investigator: California Integrated Vital Records

UC San Diego Health

Pre-COVID Population Health for most of us:

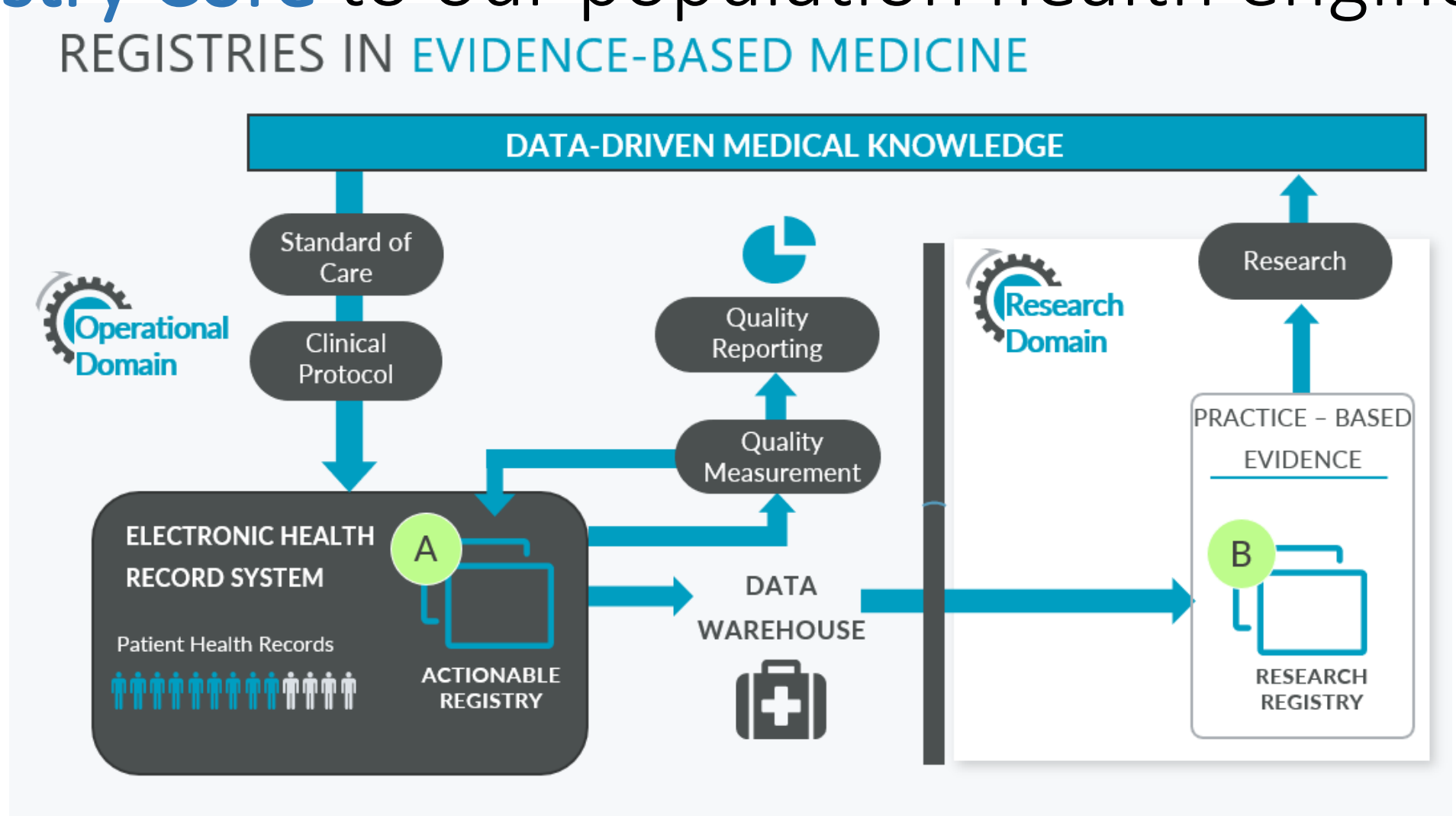
Digital health pilots & isolated navigation/ education

Complex care management – contracted lives

Protocol driven Primary Prevention [vaccine/screen]

Limited screening **Social Determinants**: Tobacco, Depression

Prior to COVID many of us were using a Registry Core to our population health engine:



- Applied Population Health, Chapters 4, 5, 10, 11 Berkovich B, Sitapati AM Applied Population Health: Delivering Value-Based Care with Actionable Registries Taylor & Francis Group, CRC Press 2019. ISBN 9780267196677.

COVID Provoked us to re-think Population Health and

So, what are the *tactical* approaches that we will be using in Population Health post COVID?

Jasmine can show us the path to the future….

Jasmine from the lens of an individual in population health…

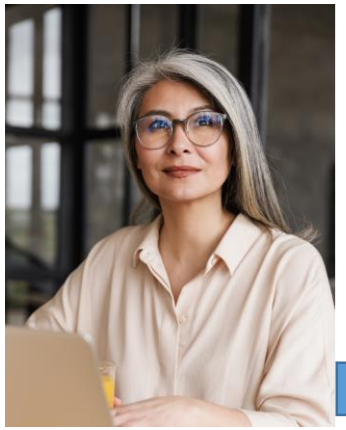
Jasmine works 60 hours a week, in a high stress tech job, with 1 child, and diabetes, hyperlipidemia, who carries BRCA1 and was just admitted with acute appendicitis. Jasmine has difficulty with walking due to osteoarthritis in her right hip and her preferred language is Mandarin.

- **Clinical informatics view:**
  - PHQ, Beck depression, Beck anxiety, etc.
    [SDoH survey]
  - Hemoglobin A1C, fasting glucose, Total cholesterol, triglyceride, LDL
    [Laboratory]
  - BRCA1
    [Scanned lab in media, ICD-10 diagnoses]
  - Osteoarthritis
    [ICD-10 diagnoses]
  - Acute general surgery
    [Order & ICD-10 diagnoses]
  - Mandarin
    [Preferred language]

Build a Population Health Program that *aligns* systems and people:

Not …… Unreliable
Not ….. Inaccessible
Not ….. Unseen outcomes
Not ….. Fragmented
Not ….. Forgotten
Not …… Racism

Prioritized engagement
Less human labor waste
More coordinated & integrated care
Tailored disease & condition specific
Identified structural barriers
Transparent outcomes
Equity centric

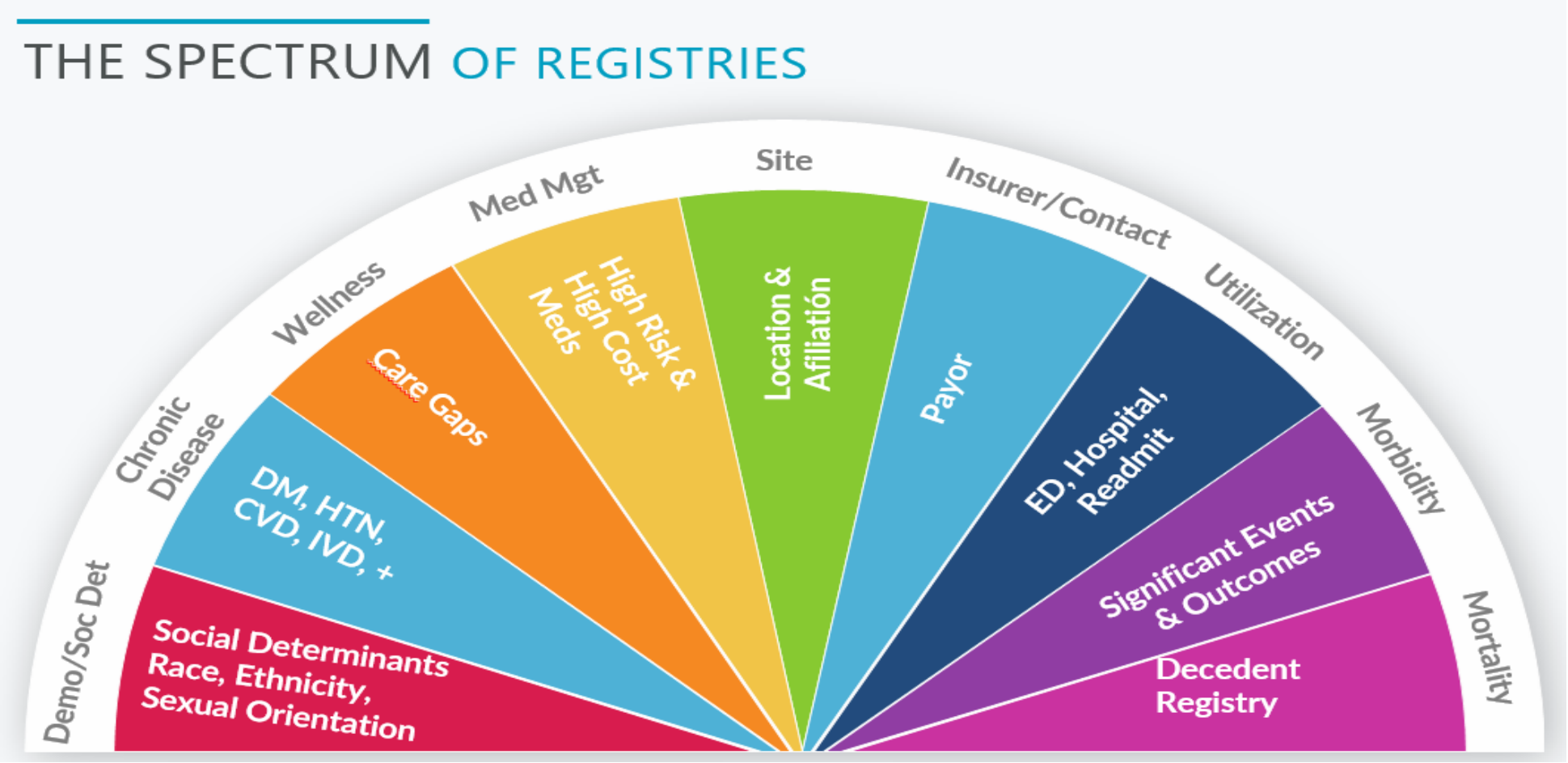


How do we build the Population Health of the future for Jasmine?

- **Registries:** wellness, depression, DM, BRCA1, acute surgical care
- **Population Health teams**: care management, social work, pharmacy, care navigation
- **Population level Clinical Decision support:** engineered ‘right’ care supports
- **Digital engagement & health coaching:** integrated glucose, text program, campaigns
- **Linguistically inclusive care:** communication in Mandarin
- **Prioritized access & Follow up:** based on acuity
- **AI/Predictive analytics:** ASCVD, Risk of Re-Admission, Risk of Re-admission to ICU, Risk of breast cancer, Risk of ER use, Risk of No Show
- **Community based**: Asian community CBO
- **Personnel and contextual SDoH:** self-completed, census track, + data

Big ‘8’ ideas in Population Health Futures

8. Anchor your strategy with Registries



- Applied Population Health, Chapters 4, 5, 10, 11 Berkovich B, Sitapati AM Applied Population Health: Delivering Value-Based Care with Actionable Registries Taylor & Francis Group, CRC Press 2019. ISBN 9780267196677.

Think about 100-200 Registries as cohorting tools New designer registries take the forefront & aim to scale nationally:

Strong foundations:

- DM, HTN, HF, +

NEW Niche, Acute & Procedural:

- Acute General Surgery
- Stroke --Get with the Guidelines
- Niche: cardiotoxicity from anthracycline, sickle cell, + high intensity small cohorts

National collaborative participation with hooks into your EMR [configure you EMR FHIR APIs for direct access]:

- Hypertension such as American Heart Association

7. Supersize your Patient Engagement for dynamic abilities to drive campaigns

CAMPAIGNS

Primary and secondary prevention catch ups! Cancer, diabetes, hypertension.

Ready a **portfolio of patient engagement tools** that utilize activation for patients

- Patient portal
- Telephonic decision trees
- Text messaging
- Mass email

Requisites: governance, close access to patient education, translation services, follow FTC communications guidance, great technology

6. Make Digital, Text, Coaching available for masses

Glucometer

Blood Pressure Cuffs

Build a robust Population Health team that offers tiered and flexible **digital health** for all your 'Hypertensive' and 'Diabetic' patients as a standard

Text Coaching program

Integrate into a team for monitoring and intense management & outreach

- Pharmacist, RN, health coach
- Integrated, patient reported

Enable efficient virtual medication management

PHARMD

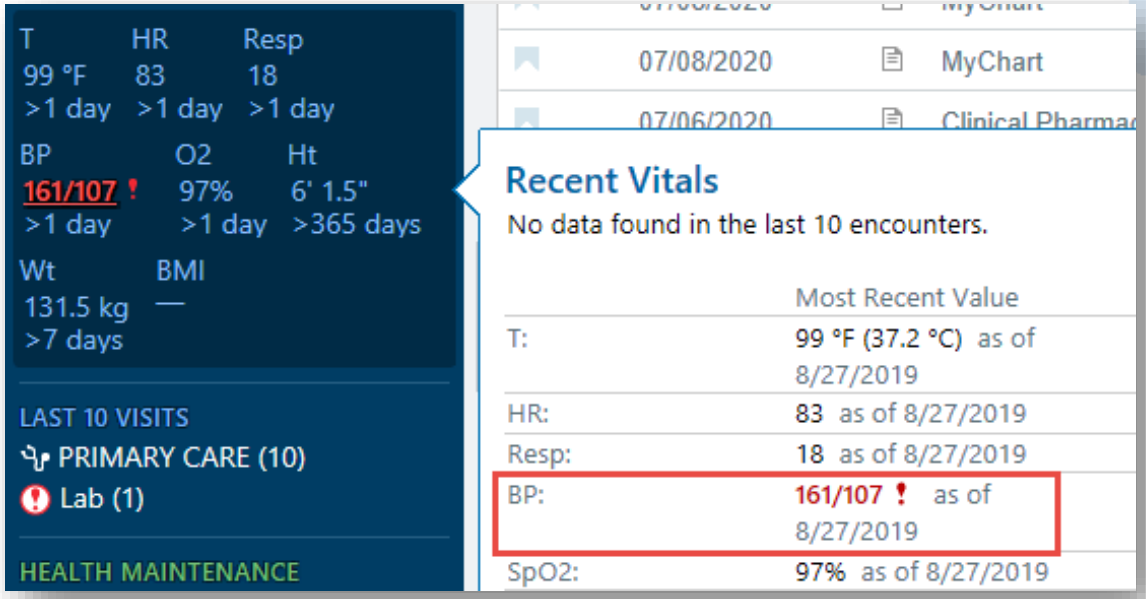
Note 9:47 AM

BP now consistently controlled at home. Will discharge patient from PHSO pharmacist outreach.

	7/21/2020	7/21/2020	7/21/2020	7/20/2020	7/20/2020	7/20/2020	7/17/2020	7/17/2020	7/17/2020
Time	8:29 AM	8:28 AM	8:27 AM	8:22 AM	8:21 AM	8:20 AM	8:15 AM	8:14 AM	8:13 AM
Systolic Blood Pressure	127	131	124	137	134	139	138	135	132
Diastolic Blood Pressure	85	85	82	84	88	86	88	90	86
Pulse	64	66	65	62	66	62	63	67	66

(average BP this morning of 127/84)

Routing to PHSO RN CM.



, PHARMD to

Hi ,
Hope all is well! I noticed your blood pressure has crept up a little bit the past couple days. I wante see how you feel about increasing your lisinopril to 10 mg daily, which is still a low dose (average d is 20 mg, and can go up to 40 mg). Ideally, it'd be great to keep your BP consistently below 140/90 that even when it fluctuates up, it's not crossing 140/90.
Please let me know if you'd be open to this change,
Thanks!

Last read by at 9:20 AM on 7/30/2020.

PHARMD

Hi 9:28 AM
That one day where it jumped up real high is because I took the measurements after a little bit of physical activity. If we need to readdress how/when I'm taking my measurements, we can, but I don't want to adjust meds based on that one day. The day after that, there was 1 of the 3 measurements over 140, but the one immediately following was at 129. That seems like to much of a spread to make decisions as well. If I should change up when/how I take my measurements, let me know. I generally do them about 15 or 20 minutes after I wake up, but long before I've gotten relay active. If you would prefer I walk around the block a few times before I take the measurement, I can. I have a feeling if we switched to that model, then my BP would raise up to the 145 range, and adjusting meds might be the right call. What do you think?

, PHARMD to

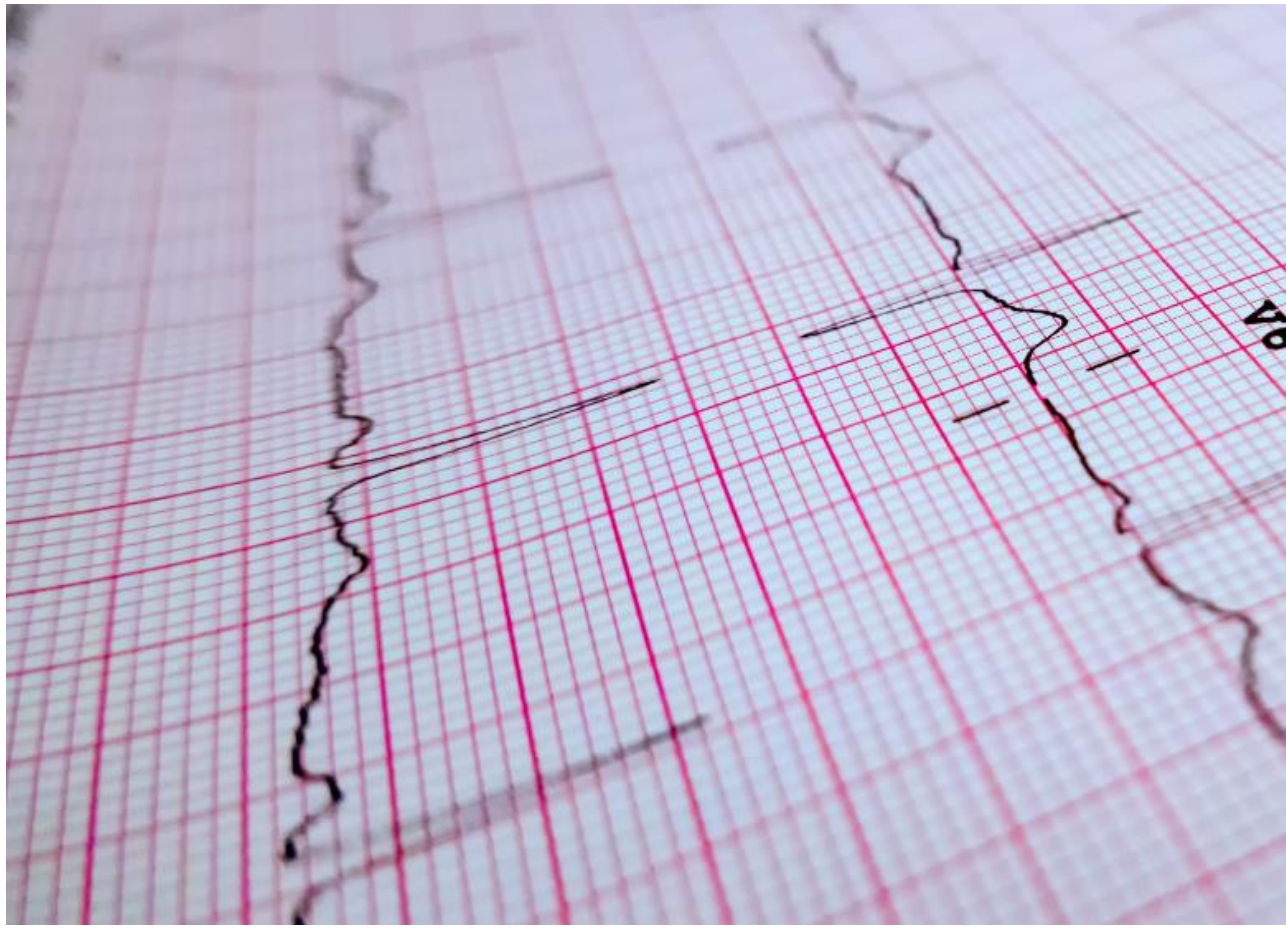
Hi , 10:5
We can definitely hold on adjusting medications if that is your preference! My mindset was that a dos increase to 10 mg wouldn't drop your BP too low (< 120/80) but would keep you more consistently below goal throughout any time of day. However, BP is expected to jump up a little after physical activity. I'd say keep checking for now, ~20 minutes after waking like you are doing (and before any caffeine) and again in the evening, but before or well after any physical activity when you feel rested a calm.
Feel free to communicate with our nurse if you notice BP starts coming up in the future an you'd like to discuss a titration in medication. Otherwise I'll leave it to you to work on diet, exercise, ar continued monitoring :)

Take care!

Last read by at 6:43 PM on 7/30/2020.

5. Use Artificial Intelligence like a vital sign

- **Risk Tools:** CHADSVASC2, ASCVD, MELD, PELD +
- **Predictive models with cloud computing:** Re-Admission, No Show, Risk of Sepsis +
- **Machine learning:** HCC-RAF
- **Novel AI application:** Radiology, Pathology, ++



Modern EMR AI Tools are sort of like assembling furniture!

Easy assembly
Just follow the directions!

With a black box for computation

An example of a flight data recorder; the underwater locator beacon is the small cylinder on the far right. (Translation of warning message in French: "FLIGHT RECORDER DO NOT OPEN".) The warning appears in English on the other side.

https://en.wikipedia.org/wiki/Flight_recorder

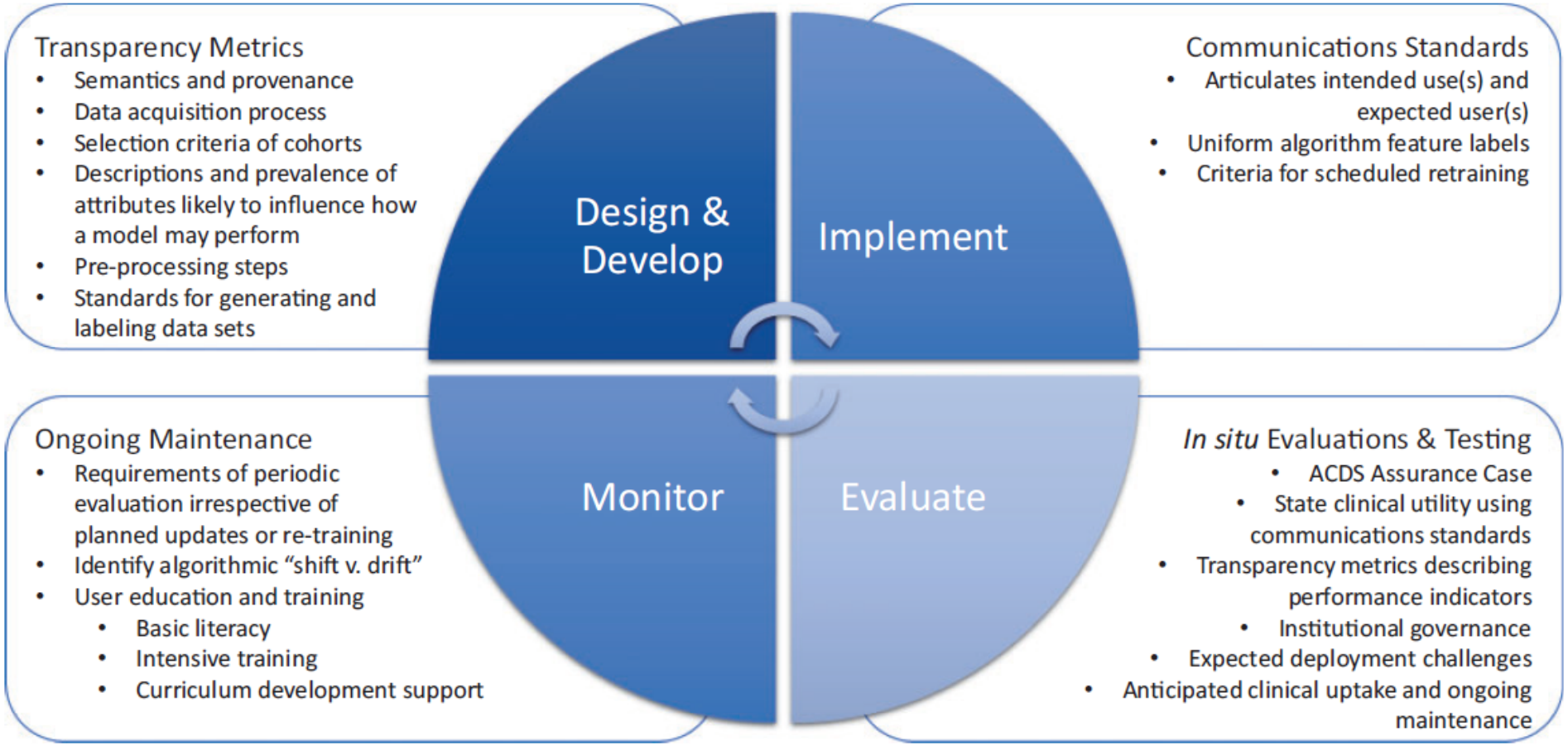


Figure 1. Policy recommendations for all stages of Adaptive CDS (ACDS)—design and development, implementation, evaluation, and ongoing monitoring—require further development to ensure safe and effective ACDS. A concerted multistakeholder effort to identify key transparency metrics for training datasets and communications standards for AI-driven applications in healthcare is needed to understand how bias can corrupt AI-driven decision support and identify ways to mitigate such bias. Additionally, policies that standardize *in situ* testing and evaluation, as well as ongoing maintenance, of ACDS should be established.

Peterson, et. al. JAMIA. 28(4), 2021, 677–684doi: 10.1093/jamia/ocaa319

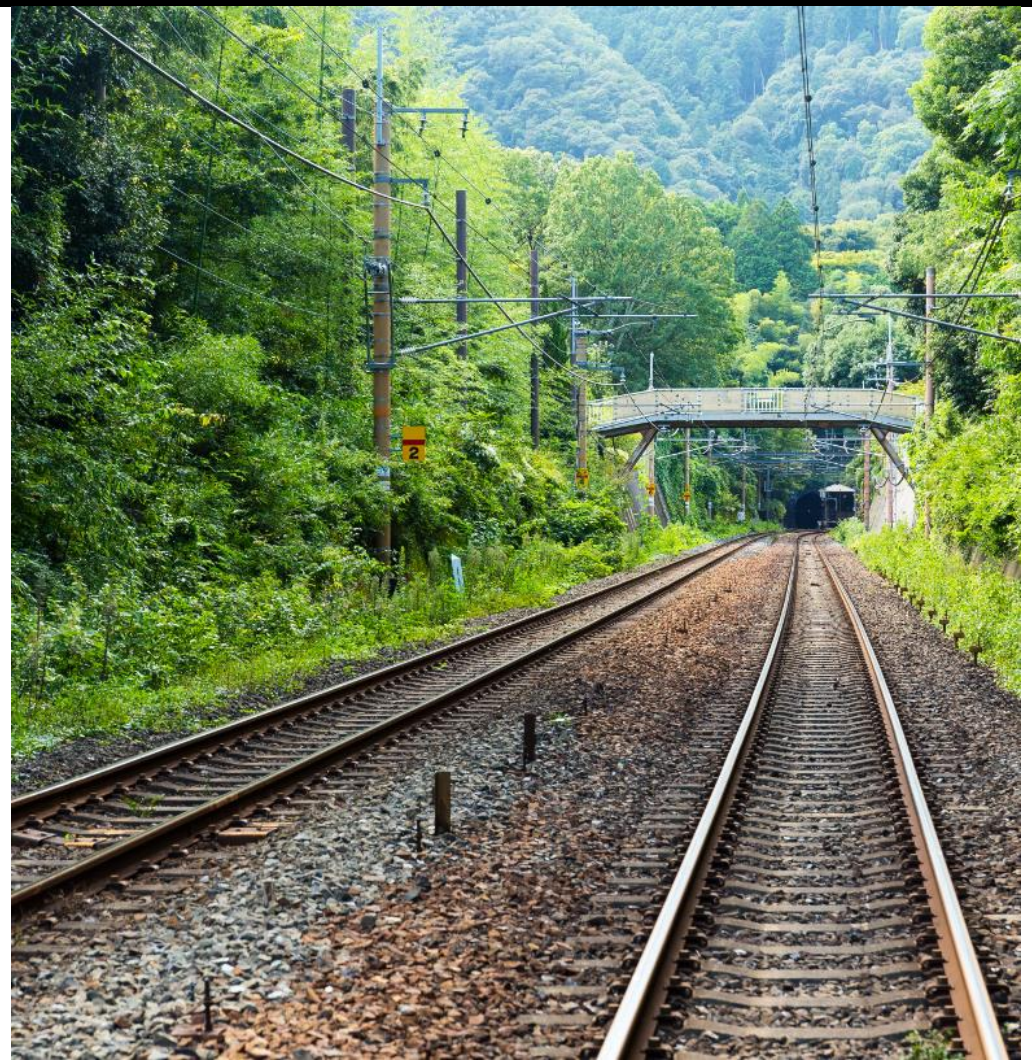
4. Design new Governance to support new systems

- Artificial Intelligence Oversight Committee [grow together]
  - Ethicist
  - Data Scientist
  - Operations
- Population Health Quality/Steering/PMO+ Committees
  - Care Management
  - Quality
  - Pharmacy
  - Operations
  - Education
  - Nursing

AI: Provide standards for validation, data governance, workflows, training, communication, communication, education, document knowledge, serve academic aims, prioritize, monitor, equity

Pop Health: Provides alignment, de-silo, synchronized workflows, inclusive, address Swiss-cheese for missed opportunities for care, SDoH, and more

3. Set bold targets for High Quality & Reliable Care



- Zero hospitalization for influenza!
- 50% reduction in loss of limb, sight, and kidneys from DM
- 75% reduction in admissions for MI and Stroke
- 80% control for BP

And, more!!

2. Weave Equity into your population health fabric

A new word to add to your vocabulary:

TECHQUITY

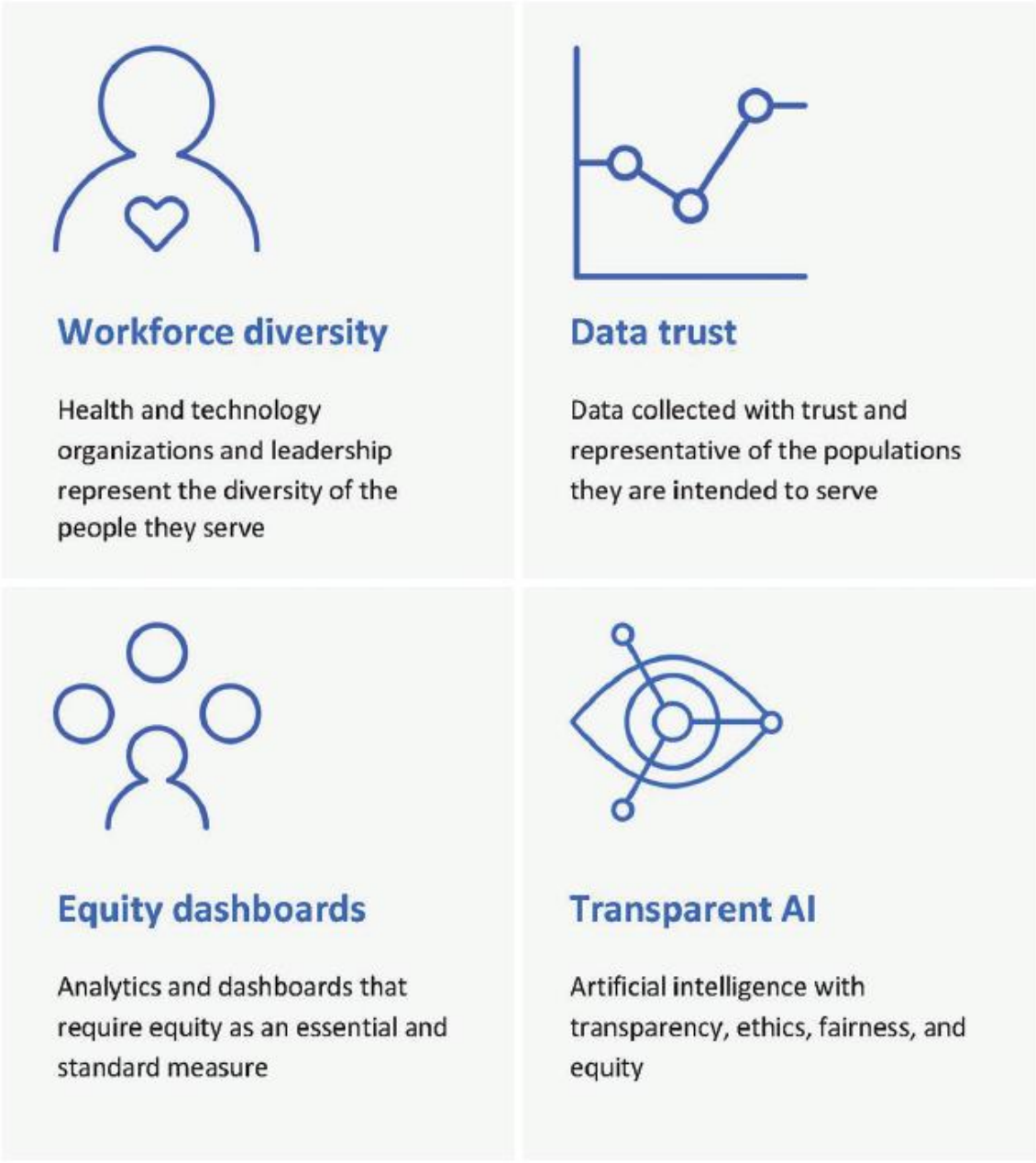
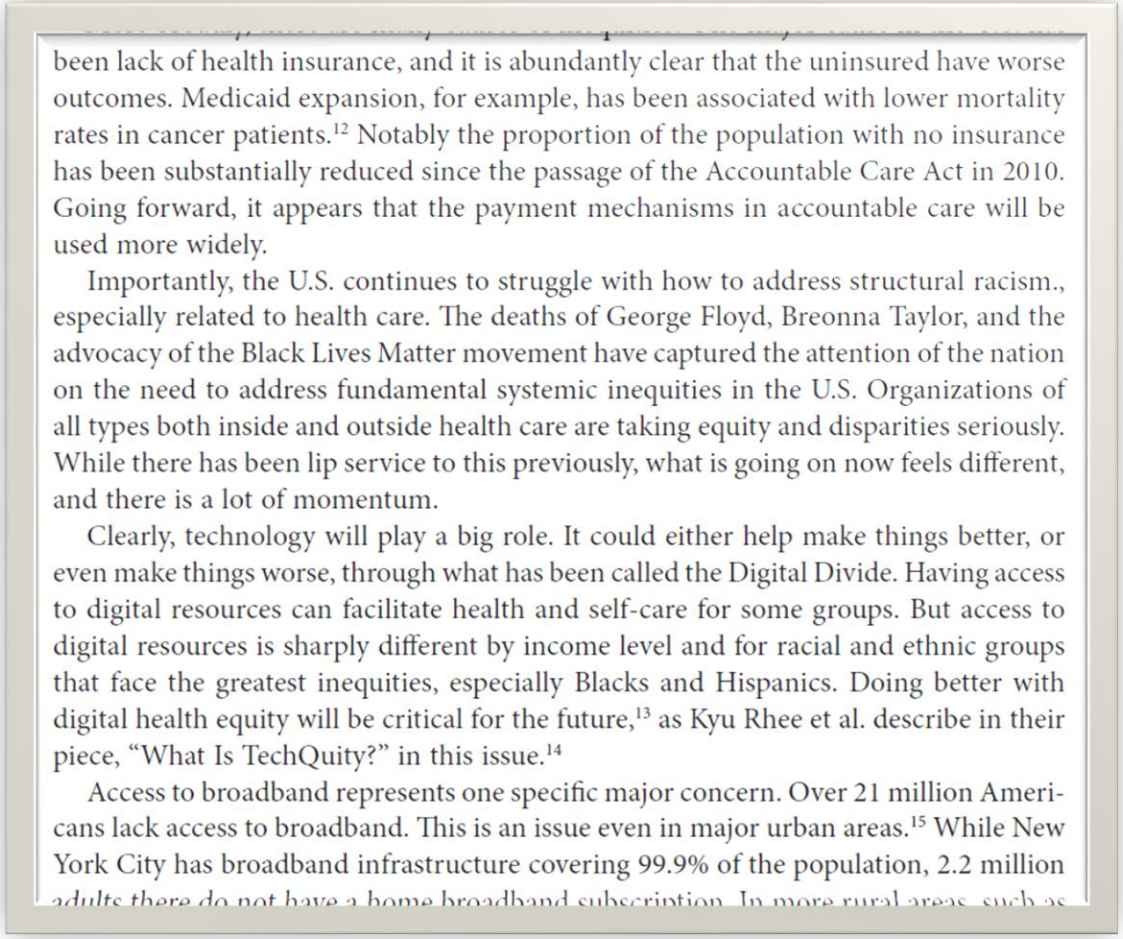


Figure 2. Four key priorities for "TechQuity."

Rhee, et.al. Journal of Health Care for the Poor and Underserved 32 (2021): xiii–xviii.

Equity: Consider where technology failures occur



been lack of health insurance, and it is abundantly clear that the uninsured have worse outcomes. Medicaid expansion, for example, has been associated with lower mortality rates in cancer patients.[12] Notably the proportion of the population with no insurance has been substantially reduced since the passage of the Accountable Care Act in 2010. Going forward, it appears that the payment mechanisms in accountable care will be used more widely.

Importantly, the U.S. continues to struggle with how to address structural racism., especially related to health care. The deaths of George Floyd, Breonna Taylor, and the advocacy of the Black Lives Matter movement have captured the attention of the nation on the need to address fundamental systemic inequities in the U.S. Organizations of all types both inside and outside health care are taking equity and disparities seriously. While there has been lip service to this previously, what is going on now feels different, and there is a lot of momentum.

Clearly, technology will play a big role. It could either help make things better, or even make things worse, through what has been called the Digital Divide. Having access to digital resources can facilitate health and self-care for some groups. But access to digital resources is sharply different by income level and for racial and ethnic groups that face the greatest inequities, especially Blacks and Hispanics. Doing better with digital health equity will be critical for the future,[13] as Kyu Rhee et al. describe in their piece, "What Is TechQuity?" in this issue.[14]

Access to broadband represents one specific major concern. Over 21 million Americans lack access to broadband. This is an issue even in major urban areas.[15] While New York City has broadband infrastructure covering 99.9% of the population, 2.2 million adults there do not have a home broadband subscription. In more rural areas, such as

Lack of Insurance

System Inequities

Digital divide

Access to Broadband

And more! --- Design alternative solutions to be more inclusive!

Bates, Journal of Health Care for the Poor and Underserved 32 (2021): Introduction

We added a few ‘wedge’ to our Quadruple Aim Quintuple Aim using Population Health

Adapted from Christopher Longhurst, UCSDH CIO
The Triple Aim: Care, Health, and Costs, Health Affairs, 2008
Triple to Quadruple Aim, Family Medicine, 2014
TechQuity, Rhee, et.al. Journal of Health Care for the Poor and Underserved 32 (2021): xiii–xviii.

Apply Equity lens to your business intelligence: quality, utilization, etc.

		Total	Jul	Aug			FY 2020	
UCSD HEALTH SYSTEM SERVICE AREA	Arrived	1,689,800	87,488	89,224			79,742	93,224
	New Appts	307,862	18,230	18,592			14,420	18,022
	Return Appts	1,379,993	69,250	70,622	67,838	79,181	64,567	65,321
	Perc New Appointments	18.24%	20.84%	20.84%				
		61.78%	53.49%	54.06%				56.15%
	Canceled Encounters	851,372					37,670	43,242
	Effective Cancelled less than 24hrs	166,862	7,392	7,639			8,049	9,585
	Bumps	56,242	2,560	2,457			2,176	3,225
	Bumped Effective Cancelled less than 24hrs	13,365	441	486	655	591	592	659
	Perc Bumps	3.22%	2.84%	2.68%	2.94%	2.82%	2.90%	2.66%
	Bumped within 24hrs Rate	0.78%	0.50%	0.54%	0.77%	0.60%	0.74%	0.82%
	Bumped within 24hrs vs Bumped Rate	23.76%	17.23%	19.78%	25.53%	20.66%	25.07%	30.28%
	Perc Canc in 24 hrs	19.30%	18.01%	18.55%	19.47%	19.54%	20.11%	20.82%
	Perc No-Show	7.42%	8.01%	7.99%	7.87%	7.90%	8.16%	8.55%

Thank you: Roberto Romita & Jennifer Holland in Information Services

Set Health Disparity Targets!

Diabetes Bundle
Latinx

Hypertension Blood Pressure Control
Black/AA

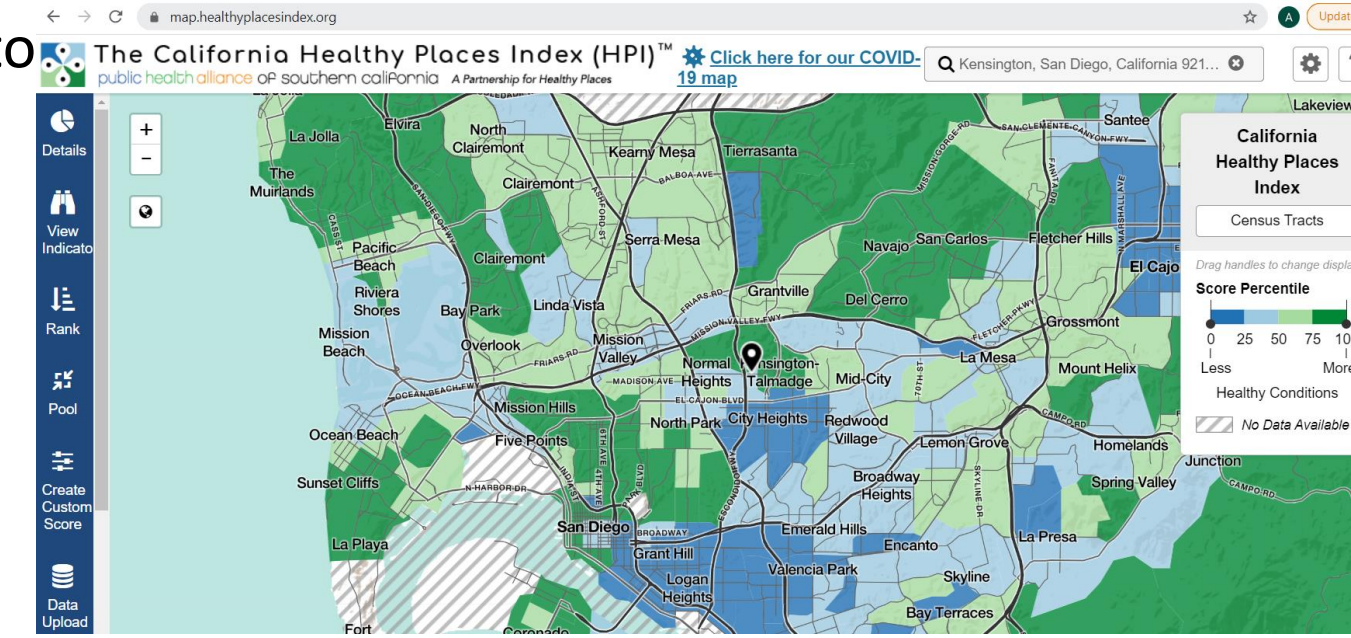
Maternal-Child Health
Black, Native & Immigrant

COVID-19 Prevention & Long-COVID care

Equitable Patient Experience

1. Bring solutions for Social Determinants of Health to your front door

- Incorporate **census tract data** sets into your patient level view
  - Healthy Places Index [CA]
  - Census track data
- Consider **universal screening** for all patients
- Screen **essential SDoH** for related domains
  - Surgery – transportation
  - Diabetic – food +
- Integrate **SDoH CBO via vendor** to your EMR
- Make **new partners** directly with CBOs with relationships that are deep and longitudinal



https://map.healthyplacesindex.org/

Rising Key Top 10 Domains in Population Health

- Geriatric aging:
- Behavioral health:
- Cancer:
- Maternal-child health:
- Cardiovascular health
- Diabetes:
- Primary prevention:
- Surgery:
- Equity and anti-racism:
- Genomics & bioinformatics:

Enabling a *healthier* world through

- **Leadership:** set and attain bold goals of what's possible in scale
- **People:** new alignment in shared goals between health delivery system inclusive of between visit care-behavioral health as well as SDoH and interdisciplinary teams, community-based organizations, research, training at a state and federal level
- **Data:** integrating novel and innovative high-quality precision-oriented care inclusive of patient reported outcomes & digital health
- **Equity:** enable and deliver one standard of care through increased inclusivity, targeted antiracism, removal of structural barriers, and new community partnerships

THANKS TO:

UCSDH Executive Leadership Team: Chris Longhurst, Tom Moore, Patty Maysent, Brian Clay, Marlene Millen

UCSDH Analytics & Population Health: Jennifer Holland, Tracy Magee, Carlos Ramirez, Jeff Pan, Josh Glandorf, Alanna Andrews

UCSDH Population Health: Parag Agnihotri, Eileen Haley, Victoria Harris

UCSDH Quality and Patient Safety: Chad VanDenBerg, Heather Erwin

UC San Diego Health Health Disparities Workstream & COVID Recovery, Diversity, Equity, and Inclusion Task Force Joyce Thompson, and Ramesh Sivagnanam; Lillian Tureaud, Mai Hoang; Shivon Carreno, Neilash Raj, Strong Zhang, Joyce Cheng; Betial Asmerom, Blanca Melendrez, Shira Abeles, Marlene Millen, Kussy MacKinzie; Eric Williamson

Photos: Under license by Envato