VC CORE
Early Career Investigator Series

February 2, 2022

CONNECTED CARE

Announcements

1. Remaining VC CORE 2022 Cyberseminars: Wednesdays at 1 PM EST
   - May 4
   - October 5
   - If interested in presenting in May, please contact VHAVirtualCareCORE@va.gov

Presenters

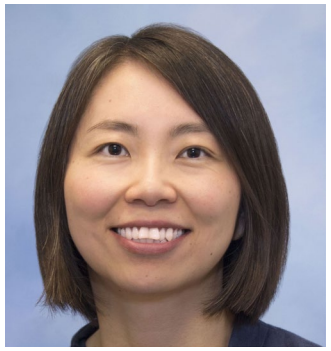
Charlie M. Wray, DO, MS, FHM

Core Investigator | Health Research Scientist

Internist & Health Services Researcher, SFVA

Assistant Professor of Medicine, UCSF

Lewei (Allison) Lin MD, MS



Research Investigator, VA Ann Arbor Healthcare System

Assistant Professor, University of Michigan Medical School

Digital Health Skillsets and Digital Preparedness: Comparison of Veterans Health Affairs Users and Other Veterans Nationally

Charlie M. Wray, DO, MS, FHM
Assistant Professor of Medicine, UCSF
Internist & Health Services Researcher, SFVA
Charlie.Wray@ucsf.edu
Twitter: @WrayCharles

Collaborators & Support

- Janet Tang, PhD
- Amy Byers, PhD
- Salomeh Keyhani, MD, MPH

This work was supported by a Veteran Health Affairs Health Services Research & Development Career Development Award (CDA 19-349-3)

Why are digital skills & preparedness important?

- **Digital Health Skillset**: set of skills and knowledge that are essential for *productive* interactions with a health care system*
- **Digital Health Preparedness**: having a sufficient quantity of digital skills to properly support digital based health care
- One's digital skillset may affect health and quality of health care, and a lack of such skills may lead to adverse clinical outcomes

*Norman CD et al. JMIR. 2006

What impacts digital skills & preparedness?

- Prior work shows that multiple individual-level factors influence one's digital health skill set:
  - age, race/ethnicity, and social risk factors (income, education, and marital status)

- No study has compared the digital health skillset and preparedness of consumers of different health systems

How might the VA perform?

- **Hypothesis**:

  Due to the VA's history and focus on the use of digital care, we hypothesize that Veterans who obtain their health care from the VA may have a greater digital health skillset and higher rates of digital preparedness than Veterans who receive care outside the VA health care system

Methods

- We used cross-sectional data from the 2016-18 National Health Interview Surveys (NHIS)
  - a nationally representative sample of noninstitutionalized individuals residing within the US, conducted annually by the CDC

- Limited to respondents ≥18 years. Samples included:
  - 3,188 Veterans who obtain care in the VA*
  - 3,393 Veterans who received care outside the VA

*which included VA, Tricare [health insurance for active-duty military], and CHAMP-VA [Civilian Health and Medical Program of the Department of Veterans Affairs

Methods

- In our analysis we included covariates known to impact an individual's digital health skills:
  - Age
  - Sex
  - Race
  - Ethnicity
  - Four social risk factors (economic instability, disadvantaged neighborhood, low educational attainment, and social isolation)

Defining Digital Health Skills & Digital Preparedness

What did we do?

Calculated descriptive statistics for Veterans who obtained care within the VA and Veterans who obtained care outside the VA

Estimated the prevalence of digital preparedness based on age, sex, race, ethnicity, and social risk among the two cohorts

Used logistic regression to estimate unadjusted and multivariable odds ratios (95% CI) of being digitally prepared for each characteristic

Patient Characteristics:

Those who received health care within the VA health care system were:

- Younger
- More often Female
- More often identified as Black
- Reported greater economic instability and social isolation

…compared to Veterans who received care outside the VA

	Veterans who receive care within the VA	Veterans who receive care outside the VA	P-value
Age			<.01
18-49	33.3 (30.7 36.0)	24.2 (21.9 - 26.5)	
50-64	24.3 (22.3 26.2)	22.8 (20.7 - 25.0)	
65-74	25.1 (23.2 - 26.9)	26.7 (24.7 - 28.6)	
75+	17.2 (15.5 - 18.8)	26.1 (24.3 - 27.9)	
Sex			
Male			
Female			
Race & Ethnicity			<.01
White	78.9 (76.7 - 81.2)	85.0 (83.0 - 86.9)	
Black	13.1 (11.2 15.0)	10.2 (8.7 - 11.8)	
Other	7.8 (6.3 - 9.3)	4.7 (3.5 - 5.8)	
Hispanic	9.1 (7.4 - 10.8)	7.1 (5.4 - 8.7)	.08
Social Risk Factors			
Economic instability	8.3 (6.9 9.8)		<.01
Disadv. neighborhood	17.7 (15.8 - 19.5)		.38
Low educ. attainment	71.3 (69.1 - 73.4)		.12
Social isolation	42.6 (40.3 44.9)		<.01

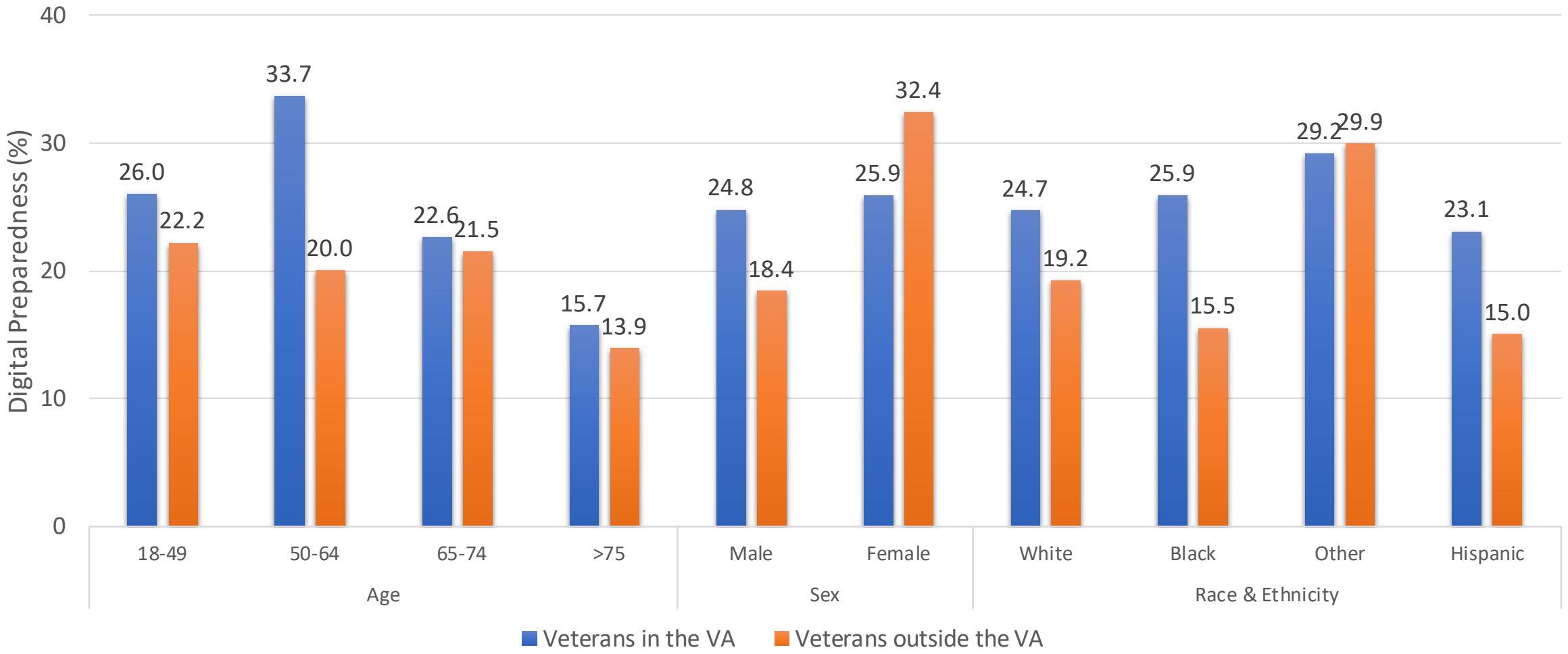
Digital Characteristics

Veterans who obtained care within the VA endorsed greater rates of:

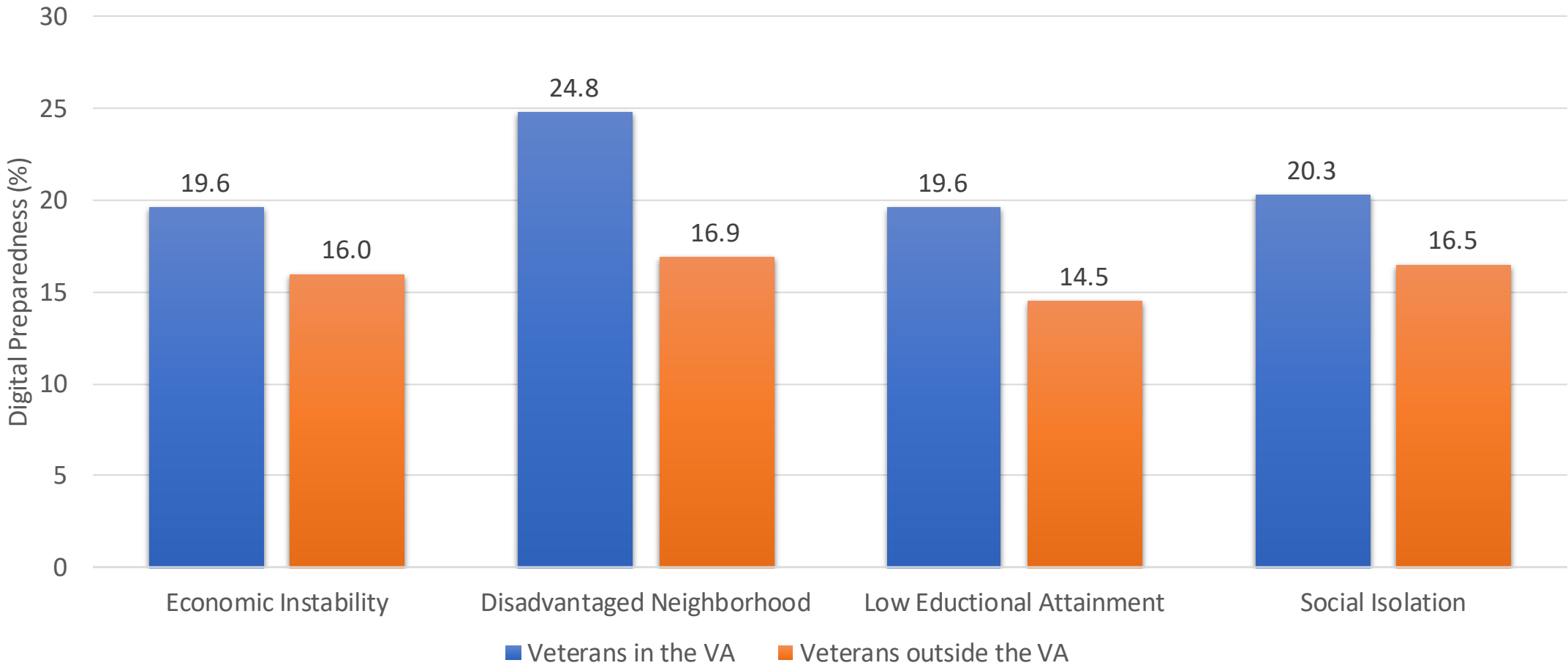
- Looking up health information on the internet
- Filling a prescription using the internet
- Scheduling a health care appointment on the internet
- Communicating with a health care provider by email

	Veterans who receive care within the VA	Veterans who receive care outside the VA	P-value
Digital Health Skills			
Look up health information on the internet	51.8 (49.2 - 54.4)	45.0 (42.6 - 47.3)	<.01
Fill a prescription using the internet	16.2 (14.5 - 18.0)	11.3 (9.6 - 13.0)	<.01
Schedule a healthcare appointment on the internet	14.1 (12.4 - 15.8)	11.6 (10.1 - 13.1)	.02
Communicate with a health care provider by email	18.0 (16.1 - 19.8)	13.3 (11.6 - 14.9)	<.01
Digital Skills Count			<.01
0	43.1 (40.6 - 45.7)	49.9 (47.5 - 52.3)	
1	31.5 (29.2 - 33.9)	30.6 (28.6 - 32.6)	
2	11.7 (10.11 - 13.2)	10.5 (9.06 - 11.9)	
3	9.0 (7.63 - 10.4)	5.8 (4.8 - 6.9)	
4	4.5 (3.55 - 5.5)	3.0 (2.1 - 3.8)	

Prevalence of digital preparedness based on sociodemographics among Veterans cared for within and outside the VA.



Prevalence of digital preparedness based on social risk factors among Veterans cared for within and outside the VA



Digital Preparedness

In multivariable models, significant negative predictors of Digital Preparedness were:

- age ≥75
- low educational attainment
- social isolation

But…receiving health care services from the VA was the only characteristic associated with higher odds of being digitally prepared

	Odds Ratio of being Digitally Prepared (95% CI)	
	Unadjusted	Adjusted[c]
Age		
18-49	Reference	Reference
50-64	1.12 (0.89 - 1.41)	1.16 (0.92 - 1.46)
65-74	0.88 (0.70 - 1.11)	0.91 (0.72 - 1.16)
≥75	0.53 (0.41 - 0.69)	0.59 (0.45 - 0.76)
Sex		
Male	Reference	Reference
Female	1.42 (1.19 - 1.70)	1.15 (0.95 - 1.40)
Race and Ethnicity		
White	Reference	Reference
Black	0.95 (0.74 - 1.24)	0.87 (0.66 - 1.14)
Other[d]	1.52 (1.09 - 2.12)	1.40 (0.97 - 2.01)
Hispanic[e]	0.83 (0.55 - 1.26)[e]	0.72 (0.48 - 1.07)
Social Risk Factors		
Economic instability	0.76 (0.56 - 1.05)	0.87 (0.62 - 1.22)
Disadvantaged neighborhood	0.90 (0.72 - 1.12)	1.01 (0.80 - 1.26)
Low educational attainment	0.39 (0.33 - 0.46)	0.40 (0.34 - 0.48)
Social isolation	0.70 (0.60 - 0.82)	0.78 (0.66 - 0.92)
Health care access		
Non-VA Health Care	Reference	Reference
Veteran's Health Affairs	1.40 (1.19 - 1.67)	1.36 (1.12 - 1.65)

What are some takeaways?

1. While previous work has highlighted individual-level factors that can affect digital skills this is the first study to assess how the health care system in which an individual receives care may influence an individual's digital preparedness
2. Veteran's digital skillsets are LOW, regardless of where they obtained care (within or outside the VA health care system)
   - ~20% of all Americans may not have proper digital literacy skills
   - Digital health skills may be low due to the socio-demographics associated with the Veterans cared for by the VA, as it selectively cares for individuals who are older, less educated, more rural, and with lower socioeconomic status – all factors known to be associated with lower digital health literacy

Is there a silver lining?

- Despite demographic disadvantages to digital uptake, **Veterans who receive care in the VA appear to have more digital health skills and be more digitally prepared than Veterans who do not receive care within the VA** – suggesting a positive, system-level influence on these individuals

Why might VA Veterans be doing better?

- VA leadership & historical use of digital-based tools.
  - **1994**: VA began a progressive uptake and use of telemedicine – with early phases characterized by local innovations and pilot studies centered around telehealth delivery
  - **2004**: A second phase of the VA's dissemination and use of telehealth modalities centered around systems approaches that supported early adoption of telemedicine and created national clinical, technological, and business foundations for the VA's developing telemedicine platforms
  - **2016: 12% of all Veterans had received some of their care through telemedicine modalities, while fewer than 1% of Medicaid and rural Medicare beneficiaries used telehealth services** during the same time period

Darkins A. The growth of telehealth services in the Veterans Health Administration between 1994 and 2014: a study in the diffusion of innovation. Telemed J E Health 2014

Why might VA Veterans be doing better?

- The VA was an early adopter in using on-demand tools, mobile applications, and other forms of digital outreach to connect with the individuals it serves:
  - In 2010, the VA was the first health care system to institute the "Blue Button" program – an online health portal which allows users direct access to their health data
  - In 2016 the VA was one of the first health care systems to perform mass distribution of video-enabled tablets (iPads) to at-risk populations as a means of improving access to care

Jacobs JC, et al. Increasing Mental Health Care Access, Continuity, and Efficiency for Veterans Through Telehealth With Video Tablets. PS American Psychiatric Publishing; 2019

Moving forward…

- To improve utilization of digital tools, health care systems must go beyond access alone and improve individual's digital and health knowledge, numeracy, navigability, communication, and decision-making skills
- Studies suggest if you improve an individual's digital skill set, you can improve health outcomes (e.g., blood pressure and medication adherence)
- Interventions targeted at older, more vulnerable populations may be more impactful

Our study has limitations…of course

1. "Veteran" categorization method may falsely misclassify some individuals
2. Definition of "digitally prepared" may be overly strict and potentially over penalizes our characterization of who is digitally prepared. (Who hasn't struggled with a patient portal!)
3. Our outcomes are based on self-report, which could be biased or incorrect
4. Use of the term "computer" in the survey question could be misleading and may underestimate the use of cellphones or other smart devices
5. The survey was conducted in the years prior to COVID-19, thus our findings may not be representative of current digital health skillsets or preparedness

Take away…

Links to article

1. Veterans who obtain services within the VA report greater digital health skills and preparedness compared to Veterans who receive their care outside the – despite a higher prevalence of risk factors known to negatively impact digital literacy
2. These findings suggests that while individual-level barriers to digital care exist, there may be system-level factors or influences that may moderate such barriers among at-risk populations – such as those served by the VA
3. As digital-based care becomes more prominent, future work should focus on what system-based interventions or programs are improving individuals' digital skillsets and ability to engage through digital mechanisms

-THE END

TELEHEALTH FOR SUBSTANCE USE DISORDERS: EVALUATING CURRENT CARE AND TESTING NEW MODELS

Lewei (Allison) Lin MD, MS

Research Investigator

VA Ann Arbor Healthcare System

Assistant Professor

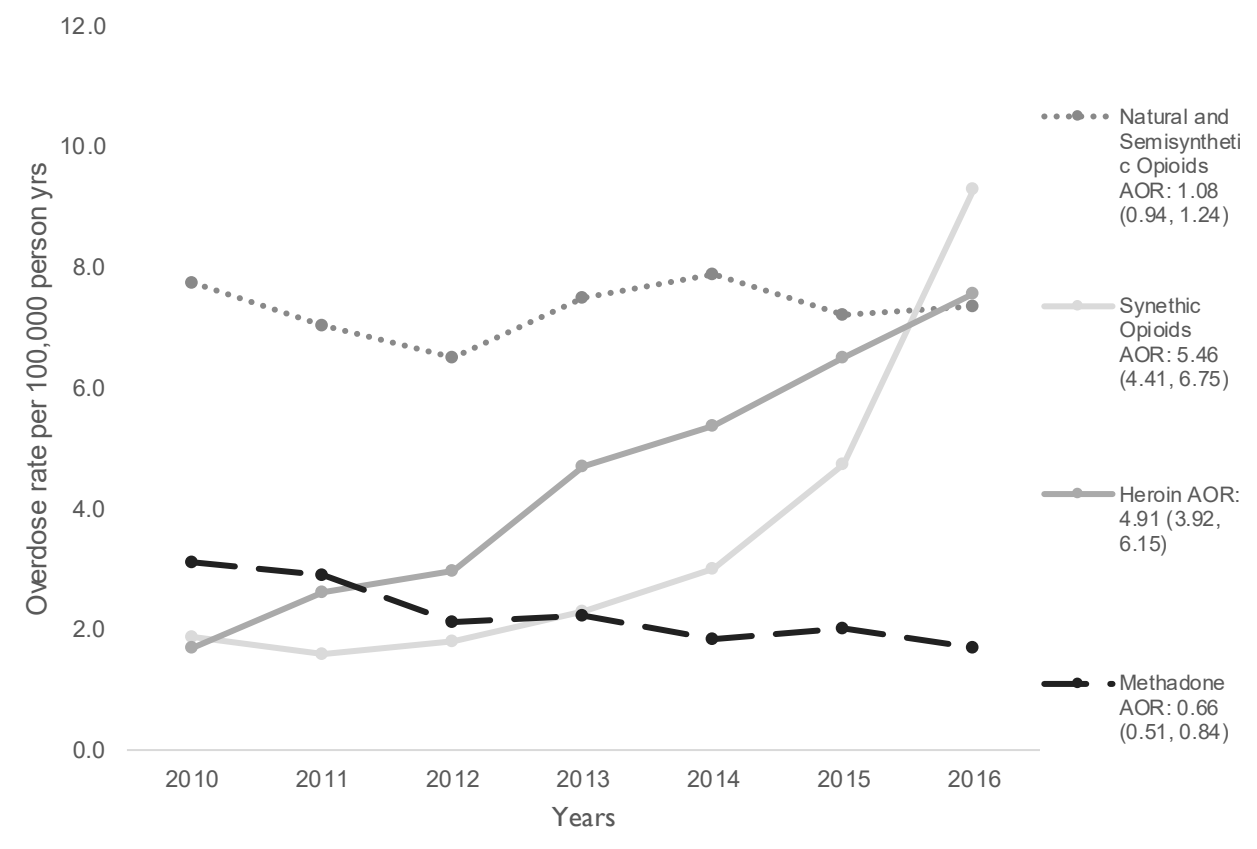
University of Michigan Medical School

M | ADDICTION CENTER

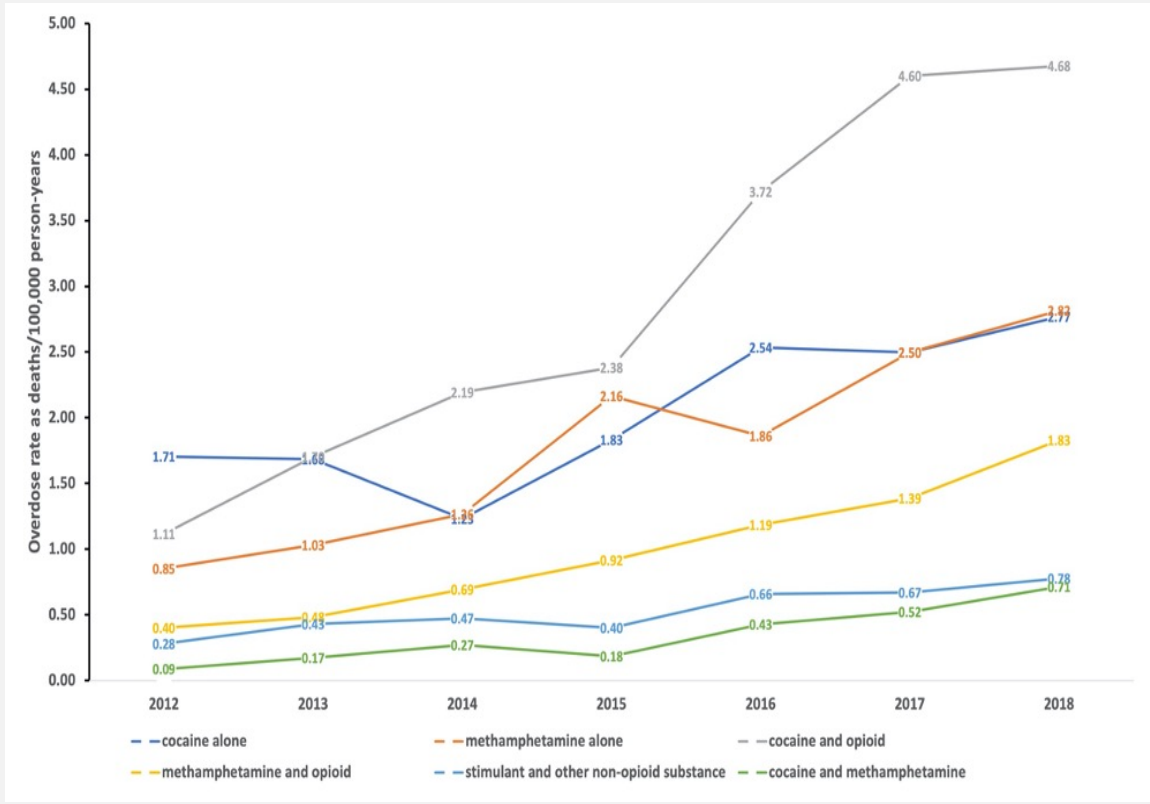
VA CCMR

THE EVOLVING OVERDOSE EPIDEMIC IN VETERANS

Opioids



Stimulants



Overdose rates increasing dramatically, primarily due to street drugs (e.g. fentanyl, methamphetamine, cocaine), often used in combination

(Lin *AJPM* 2019, Coughlin *Addiction*, 2021)

EFFECTIVE TREATMENTS FOR OUD & OTHER SUDS EXIST

Methadone And Buprenorphine Are Associated With Reduced Mortality After Nonfatal Opioid Overdose

RETROSPECTIVE COHORT, MASSACHUSETTS PUBLIC HEALTH DATASET, 2012-2014

17,568 opioid overdose survivors
with ambulance or hospital encounter

Only 3 in 10 receive MOUD*
over 12 months of follow-up

*Medication for Opioid Use Disorder

Mortality at 12 months:
4.7 deaths / 100 person-yrs

Association of MOUD* with mortality:

- Methadone ↓ 53%
- Buprenorphine ↓ 37%
- Naltrexone** ↔

** *limited by small sample*

Larochelle et al. *Annals of Internal Medicine*. 2018.

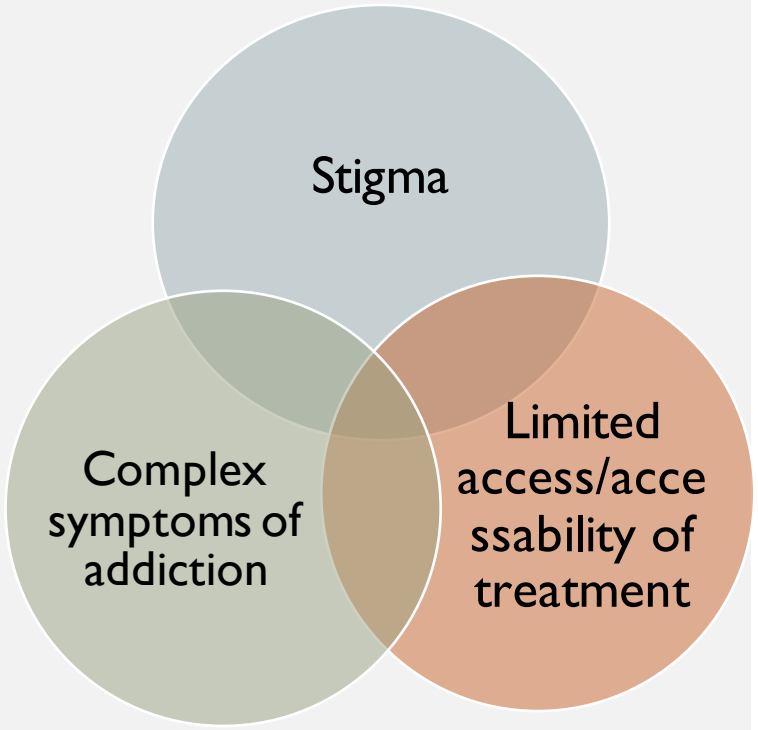
Boston Medical Center; Grayken Center for Addiction, Boston Medical Center; CARE; Boston University School of Medicine

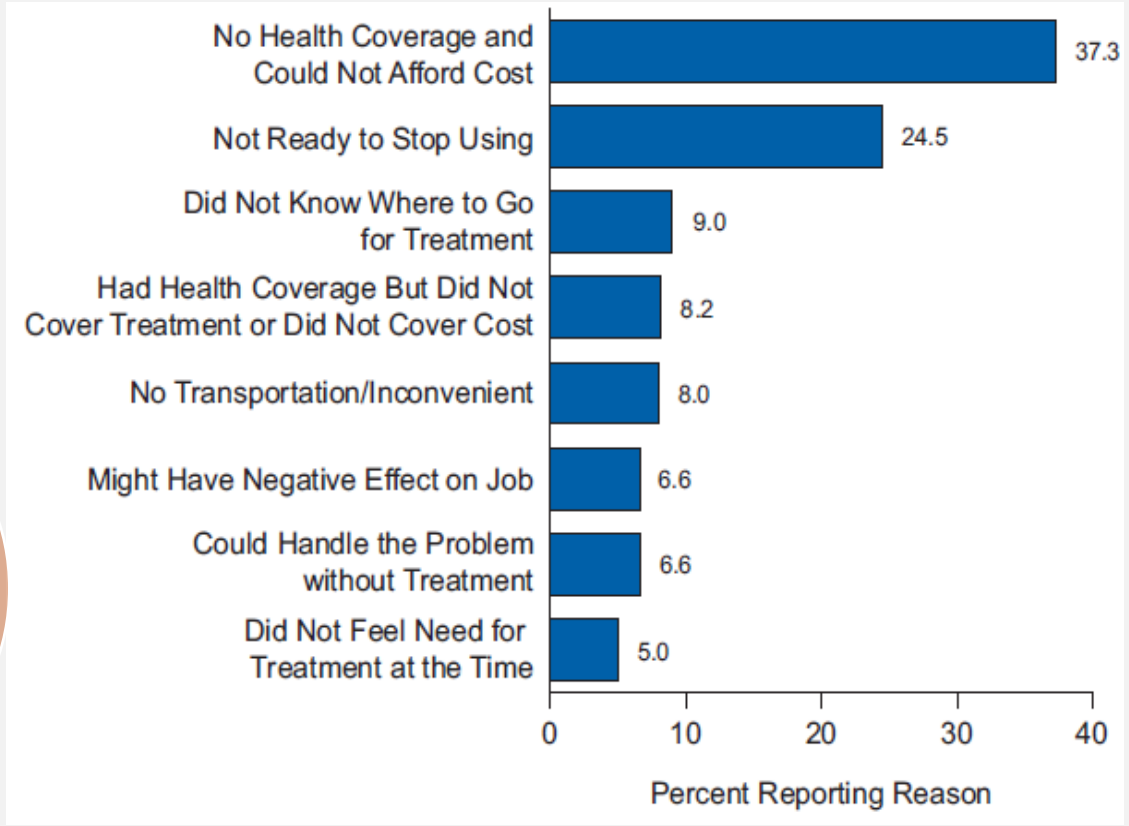
LOW CURRENT TREATMENT RATES

- Estimates of ONLY ~10% of patients with alcohol use disorder and ~33% of patients with opioid use disorder receive effective treatments. Rates lower in community than in VHA.

- Even in those who access/start treatment, retention is low and there is high risk for overdose and other negative outcomes when patients stop treatment.

WHAT ARE THE BARRIERS TO CARE?





(SAMHSA, 2015)

DISTANCE A PARTICULAR BARRIER FOR SUD BUT TELEHEALTH UNDERUSED

- Distance has been described by patients as a major reason for discontinuing SUD treatment and associated with lower followup for SUD treatment

- Particularly challenging for SUD treatment that often requires frequent (weekly) visits over time and many clinics may discharge patients if they miss appointments

- Particular barrier for this patient population - "What's the one thing that could help you engage in treatment?…"

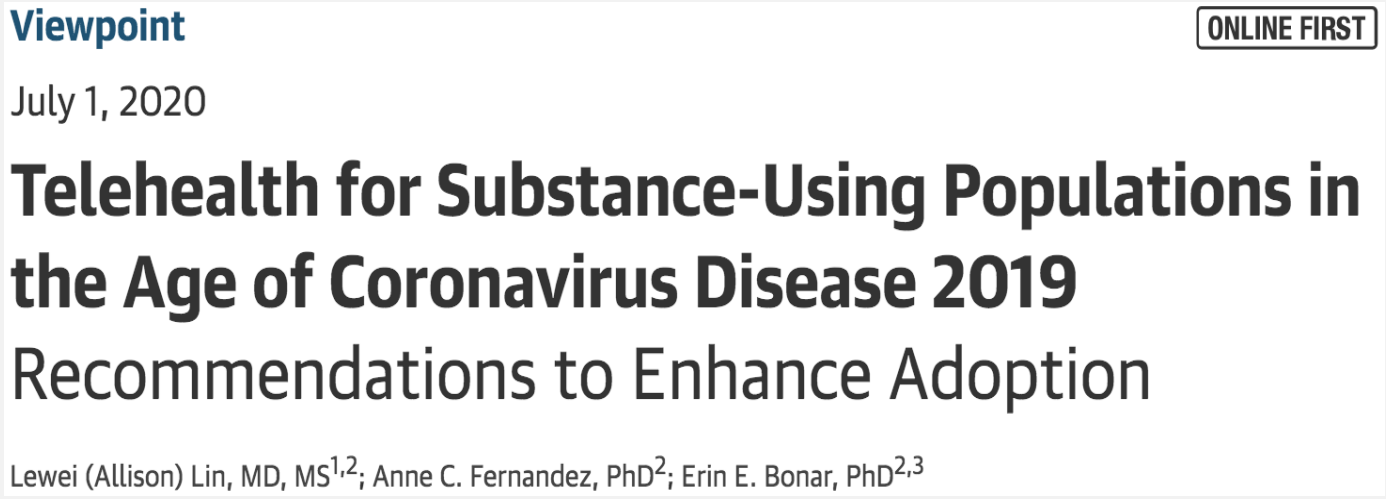
  "That's easy, a car!"

- Despite potential, there are few studies of telehealth for SUDs and lower use compared to other mental health disorders

(Gryczynski et al., 2014; Schmitt et al., 2003, Lin et al 2019)

AND THEN CAME COVID-19

- Ryan Haight Online Pharmacy Act Exemption during Public Health Emergency
- New guidance and changes from SAMHSA, DEA, payers and others decreasing barriers in :
  - Use of phone visits
  - Prescribing across state lines
  - CFR42 part 2
  - HIPAA
  - Reimbursement



Viewpoint

ONLINE FIRST

July 1, 2020

Telehealth for Substance-Using Populations in the Age of Coronavirus Disease 2019

Recommendations to Enhance Adoption

Lewei (Allison) Lin, MD, MS[1,2]; Anne C. Fernandez, PhD[2]; Erin E. Bonar, PhD[2,3]

KEY AREAS OF RESEARCH NEEDED FOR SUD TELEHEALTH

1. Understand Veteran perspectives on telehealth
2. Examine telehealth for SUD treatment and outcomes
3. Develop and test new models of telehealth to improve outcomes

1. UNDERSTAND VETERAN PERSPECTIVES ON TELEHEALTH

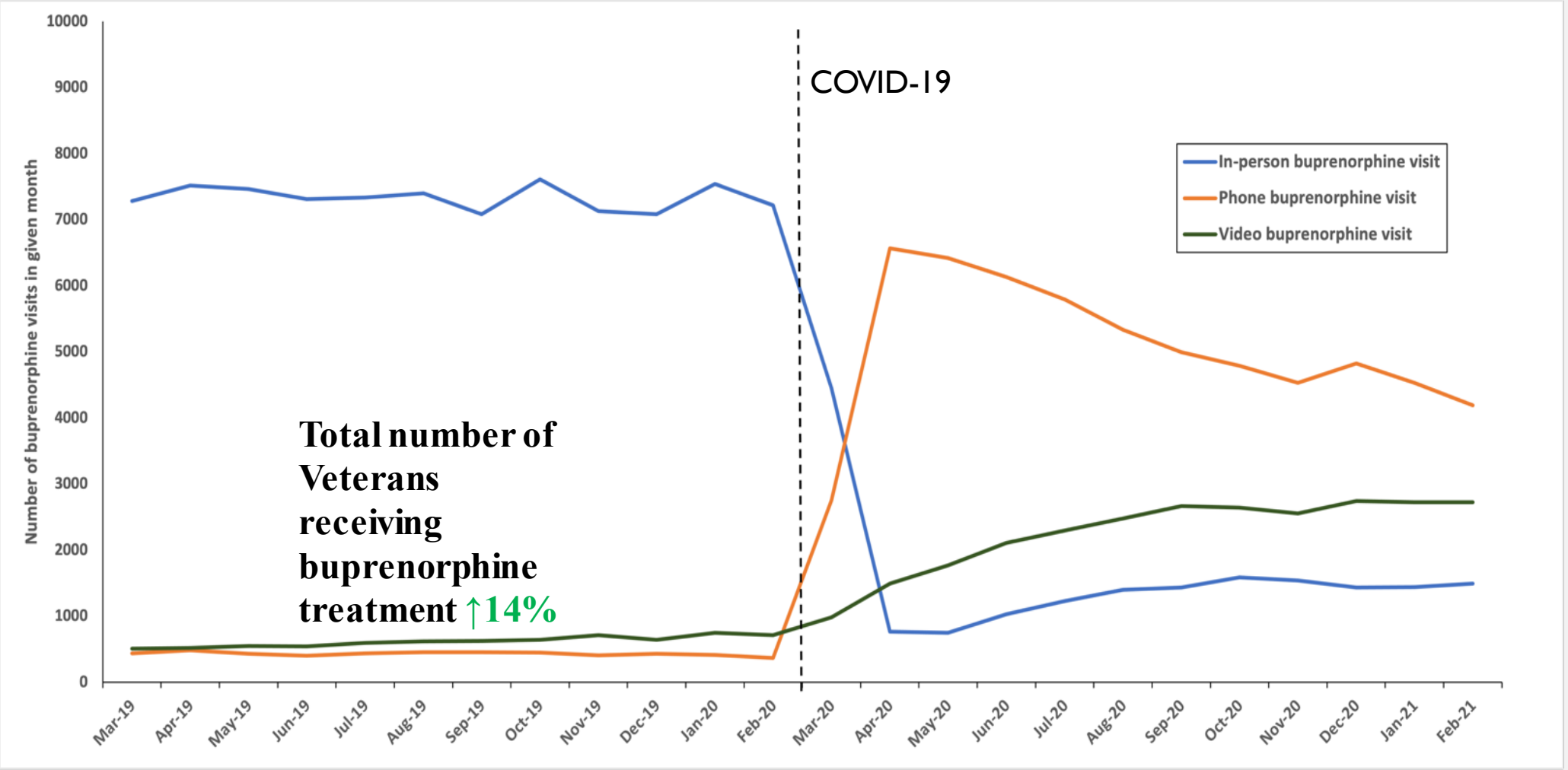
1. VETERAN VIEWS OF TELEHEALTH FOR SUD

Telehealth advantages	Telehealth disadvantages	Ongoing challenges to address
Decreased SUD stigma "I would say that it would be the phone, in some ways I feel better. The actual non-contact is easier because you can't see if they're judging you or not"	**Decreased connection** "When you remove that human element where you're in the same room with me…you remove the human aspect of it"	**Technology access & SUD logistics** "You know I don't have a lot of money, I do the monthly minute thing so there were times when I was worried" "The least helpful part is…medication getting lost in the mail, the VA not getting your UDS, …that's real real crazy stuff to happen, you don't want to wind up with no medication…"

Perspectives of patients with SUDs : Not just 'one-size fits all.' Emphasize need for telehealth options & hybrid models

2. UNDERSTAND COVID-19 IMPACTS ON TELEHEALTH USE AND PATIENT OUTCOMES

DRAMATIC INCREASE IN OUD TELEHEALTH SINCE COVID-19



(Lin et al, under review)

3. NEW MODELS OF TELEHEALTH TO INCREASE TREATMENT AND IMPROVE OUTCOMES

TESTING NOVEL INTERVENTIONS TO FOR COMPLEX OUD PATIENTS

- **Persist Study** (NCCIH R01 AT010797 Ilgen & Lin MPI)
  - Test an 8 session cognitive behavioral therapy phone-delivered pain management and relapse prevention intervention for patients with OUD and chronic pain
  - Sample: n = 200 (community sample and Veterans)
  - Outcomes across 1 year follow-up: buprenorphine retention, pain and substance use outcomes

FUTURE OF TELEHEALTH: CAN TELEHEALTH BE USED TO INCREASE AND IMPROVE CARE?

- Can we better engage the majority of patients with substance use disorders who are not receiving treatment?

- **Project In.Reach & Vet.Reach** (NIAAA R01 AA029400 Lin & Bonar MPI, VA ORH)
  - Proactively outreach to patients struggling with substance use
  - Help people link to and engage in care
  - Decrease stigma of substance use treatment
  - More appealing and accessible treatment options, especially for under-served populations

EARLY CAREER LESSONS LEARNED

- Learn and integrate "mixed methods" (e.g., qualitative, quantitative, survey, clinical trials, implementation science)
- Seek opportunities to collaborate and mentor others
- Engage with different operational stakeholders and funders (e.g. VCC and HSR&D cores, ORH, NIH)
- Focus on impact

QUESTIONS ?

Contact:

Lewei (Allison) Lin MD, MS

Leweil@med.umich.edu, lewei.lin@va.gov

REFERENCES

- •Finlay, A.K., Harris, A.H.S., Rosenthal, J., Blue-Howells, J., Clark, S., McGuire, J., Timko, C., Frayne, S.M., Smelson, D., Oliva, E., Binswanger, I., 2016. Receipt of pharmacotherapy for opioid use disorder by justice-involved U.S. Veterans Health Administration patients. Drug Alcohol Depend. 160, 222–226. https://doi.org/10.1016/j.drugalcdep.2016.01.013
- •Fortney, J., Enderle, M., McDougall, S., Clothier, J., Otero, J., Altman, L., Curran, G., 2012. Implementation outcomes of evidence-based quality improvement for depression in VA community based outpatient clinics. Implement. Sci. IS 7, 30. https://doi.org/10.1186/1748-5908-7-30
- •Gryczynski, J., Mitchell, S.G., Jaffe, J.H., O'Grady, K.E., Olsen, Y.K., Schwartz, R.P., 2014. Leaving buprenorphine treatment: Patients' reasons for cessation of care. J. Subst. Abuse Treat. 46, 356–361. https://doi.org/10.1016/j.jsat.2013.10.004
- •Haffajee, R.L., Lin, L.A., Bohnert, A.S.B., Goldstick, J.E., 2019. Characteristics of US Counties With High Opioid Overdose Mortality and Low Capacity to Deliver Medications for Opioid Use Disorder. JAMA Netw. Open 2, e196373. https://doi.org/10.1001/jamanetworkopen.2019.6373
- •Hedegaard, H., 2017. Drug Overdose Deaths in the United States, 1999–2016 8.
- •Huskamp, Haiden A., Busch, Alisa B., Souza, Jeffrey, Uscher-Pines, Lori, Rose, Sherri, Wilcock, Andrew, Landon, Bruce E., Mehrotra, Ateev, 2018. How Is Telemedicine Being Used In Opioid And Other Substance Use Disorder Treatment? | Health Affairs. Health Aff. (Millwood) 37.
- •Kariisa, M., Scholl, L., Wilson, N., Seth, P., Hoots, B., 2019. Drug Overdose Deaths Involving Cocaine and Psychostimulants with Abuse Potential - United States, 2003-2017. MMWR Morb. Mortal. Wkly. Rep. 68, 388–395. https://doi.org/10.15585/mmwr.mm6817a3
- Lin LA, Fernandez AC, Bonar EE. Telehealth for substance using populations in the age of COVID-19: Recommendations to enhance adoption. *JAMA Psychiatry*. Published online in press.
- Lin LA, Bohnert ASB, Blow FC, et al. Polysubstance use and association with opioid use disorder treatment in the US Veterans Health Administration. *Addiction*. Published online In press.
- •Lin, L.A., Peltzman, T., McCarthy, J.F., Oliva, E.M., Trafton, J.A., Bohnert, A.S.B., 2019. Changing Trends in Opioid Overdose Deaths and Prescription Opioid Receipt Among Veterans. Am. J. Prev. Med. 57, 106–110. https://doi.org/10.1016/j.amepre.2019.01.016
- •Manhapra, A., Petrakis, I., Rosenheck, R., 2017. Three-year retention in buprenorphine treatment for opioid use disorder nationally in the Veterans Health Administration. Am. J. Addict. 26, 572–580. https://doi.org/10.1111/ajad.12553
- •Oliva, E.M., Harris, A.H.S., Trafton, J.A., Gordon, A.J., 2012. Receipt of opioid agonist treatment in the Veterans Health Administration: facility and patient factors. Drug Alcohol Depend. 122, 241–246. https://doi.org/10.1016/j.drugalcdep.2011.10.004
- •Powers, B.B., Homer, M.C., Morone, N., Edmonds, N., Rossi, M.I., 2017. Creation of an Interprofessional Teledementia Clinic for Rural Veterans: Preliminary Data. J. Am. Geriatr. Soc. 65, 1092–1099. https://doi.org/10.1111/jgs.14839
- •Ruskin, P.E., Silver-Aylaian, M., Kling, M.A., Reed, S.A., Bradham, D.D., Hebel, J.R., Barrett, D., Knowles, F., Hauser, P., 2004. Treatment outcomes in depression: comparison of remote treatment through telepsychiatry to in-person treatment. Am. J. Psychiatry 161, 1471–1476. https://doi.org/10.1176/appi.ajp.161.8.1471
- •SAMHSA, 2015. Receipt of Services for Behavioral Health Problems: Results from the 2014 National Survey on Drug Use and Health.

Early Career Investigators Insights

Mentorship. Mentorship. Mentorship. Find someone who will/can support you in all the different ways (time, resources, $$, interest)

Don’t reinvent the wheel. A lot of what you will do has already been done before. Ask for resources from those who have gone before you

Give yourself twice as much time as you think you’ll need. Research happens at a snail's pace

-Charlie Wray, DO, MS