A panoramic view of a city skyline with various skyscrapers and buildings under a clear sky. The foreground shows some greenery and a body of water.

# **Technological and Educational Challenges with the Integration of Telemedicine into Primary Care Practices during the COVID-19 Pandemic: A Clinician Perspective**

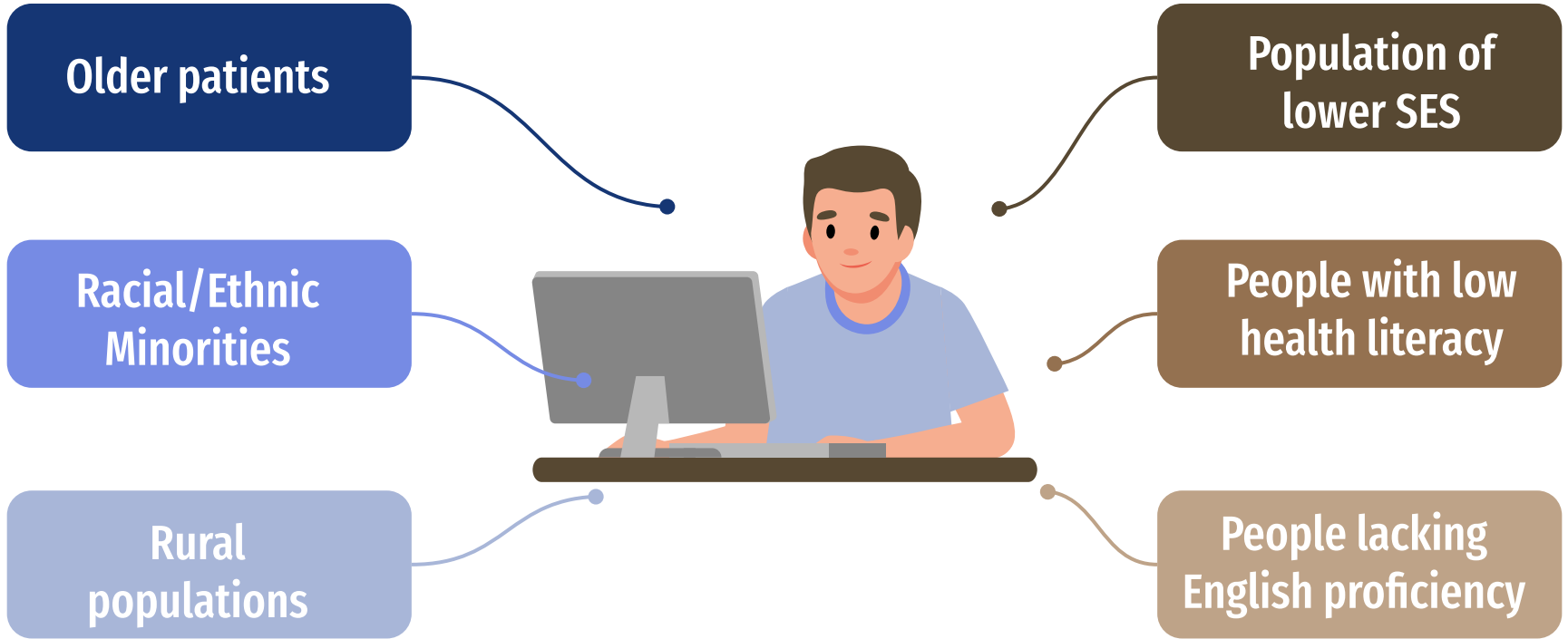
Neha Shankar, Emily Bassett, Raghav Neupane, Rebecca Etz PhD

Department of Family Medicine and Population Health  
Virginia Commonwealth University, School of Medicine



**VCU** Family Medicine and  
Population Health

# Groups most likely impacted by the “Digital Divide”



# 1 in 4 Americans

Lack the digital literacy skills or  
technology necessary to participate in  
video-based telemedicine visits



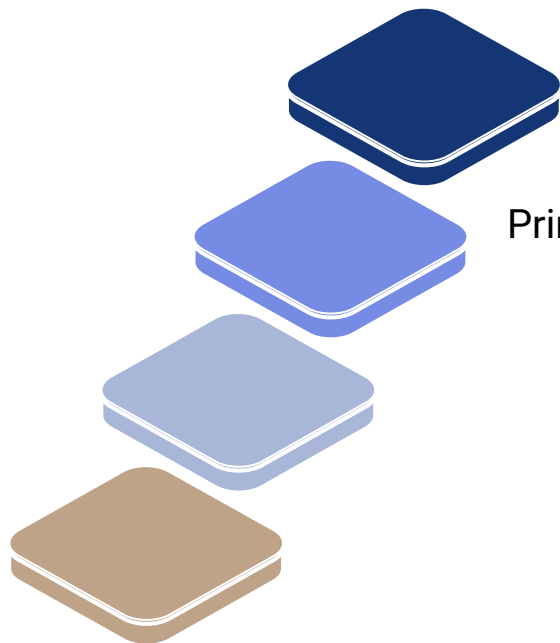
Introduction

Methods

Results

Conclusion

# Methodology



Longitudinal Cohort Study

Primary Care Clinicians from a variety of states and disciplines (n=113)

8 surveys in 1 cycle; 2 cycles total  
(March 2021 → November 2021)

Examined clinicians' perceptions of telemedicine and its effect on healthcare delivery & equity

Cohort Study



Respondents



16 surveys



Questions



Introduction

Methods

Results

Conclusion

# Telemedicine utilization

93% of the PCPs use telemedicine more frequently compared to before the pandemic



49% and 24% of respondents expressed their likelihood of using telemedicine for 5-20% and more than 20% of patient care following the pandemic, respectively

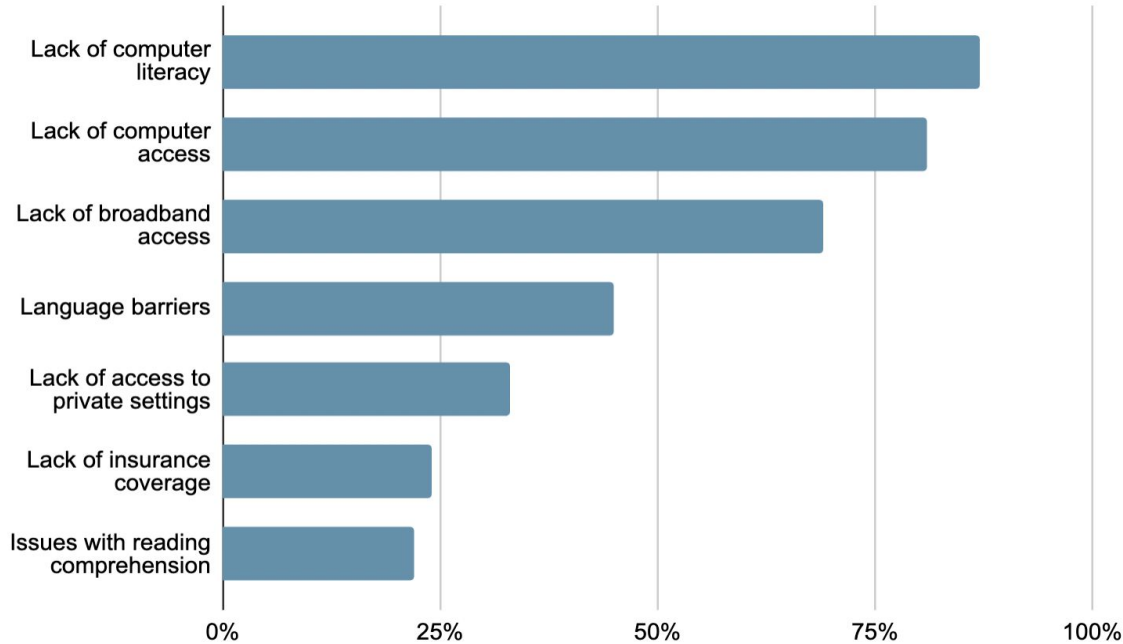
Introduction

Methods

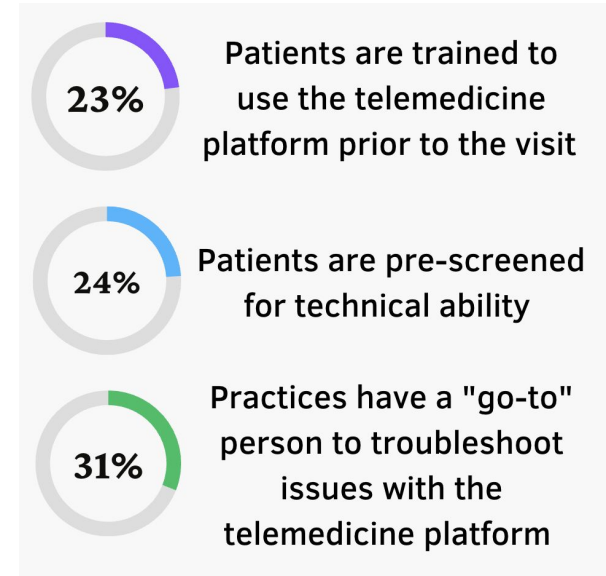
Results

Conclusion

# Findings



**Figure 1. Quantifying Physicians' Observations: Common Barriers to Telemedicine Experienced by Patients**



**Figure 2. Adoption of telemedicine into workflow**

Introduction

Methods

Results

Conclusion

# Telemedicine benefits



74% of respondents reported that telemedicine facilitated new and helpful connections with patients



55% stated that telemedicine improved their ability to monitor patients at home



76% of respondents either somewhat or completely agreed that telemedicine has allowed for broader patient access

# Limitations

## Number of participants

More study participants needed to improve study's generalizability



## No statistical analysis

Unable to perform statistical analysis due to lack of direct comparison of data

Introduction

Methods

Results

Conclusion



# Discussion and Next Steps

- Large percentage of physicians reporting digital literacy as a barrier to telemedicine use in patients (87%)
- Evidence of a lack of emphasis on patient education/training on telemedicine platforms in PCP practices to prepare patients for visits
- Warrants further research
  - Patient-reported barriers
  - Impact of patient telemedicine training on prevalence of the “Digital Divide”
  - Special attention to patient populations affected by the “Digital Divide”

# Thank you!

The data collected and analyzed for this study were funded by a grant by Agency for Healthcare Research and Quality (1R01HS028253-1), the Corey and Andrew Morris-Singer Foundation and the

Samueli Foundation

# References

- Cantor, J. H., McBain, R. K., Pera, M. F., Bravata, D. M., & Whaley, C. M. (2021). Who is (and is not) receiving telemedicine care during the COVID-19 pandemic. *American Journal of Preventive Medicine*, 61(3), 434–438. <https://doi.org/10.1016/j.amepre.2021.01.030>
- Chu C, Cram P, Pang A, Stamenova V, Tadrus M, Bhatia RS. Rural Telemedicine Use Before and During the COVID-19 Pandemic: Repeated Cross-sectional Study *J Med Internet Res* 2021;23(4):e26960 doi: 10.2196/26960 PMID: 33769942 PMCID: 8023379
- Friedman C, VanPuymbrouck L. Telehealth Use By Persons with Disabilities During the COVID-19 Pandemic. *Int J Telerehabil*. 2021 Dec 16;13(2):e6402. doi: 10.5195/ijt.2021.6402. PMID: 35646237; PMCID: PMC9098125.
- Gilkey MB, Kong WY, Huang Q, Grabert BK, Thompson P, Brewer NT Using Telehealth to Deliver Primary Care to Adolescents During and After the COVID-19 Pandemic: National Survey Study of US Primary Care Professionals *J Med Internet Res* 2021;23(9):e31240 doi: 10.2196/31240 PMID: 34406974 PMCID: 8437399
- Alkilany, R., Tarabichi, Y. and Hong, R. (2022), Telemedicine Visits During COVID-19 Improved Clinic Show Rates. *ACR Open Rheumatology*, 4: 136-141. <https://doi.org/10.1002/acr2.11372>
- Gomez T, Anaya YB, Shih KJ, Tarn DM. A Qualitative Study of Primary Care Physicians' Experiences With Telemedicine During COVID-19. *J Am Board Fam Med*. 2021 Feb;34(Suppl):S61-S70. doi: 10.3122/jabfm.2021.S1.200517. PMID: 33622820.
- Nanda M, Sharma R. A Review of Patient Satisfaction and Experience with Telemedicine: A Virtual Solution During and Beyond COVID-19 Pandemic. *Telemed J E Health*. 2021 Dec;27(12):1325-1331. doi: 10.1089/tmj.2020.0570. Epub 2021 Mar 12. PMID: 33719577.
- Nouri, S., Khoong, E. C., Lyles, C. R., & Karliner, L. (2020). Addressing equity in telemedicine for chronic disease management during the Covid-19 pandemic. *NEJM Catalyst Innovations in Care Delivery*, 1(3).

# References

- Velasquez, D., & Mehrotra, A. (2020). Ensuring the growth of telehealth during COVID-19 does not exacerbate disparities in care. *Health Affairs Forefront*.
- Lam, K., Lu, A. D., Shi, Y., & Covinsky, K. E. (2020). Assessing telemedicine unreadiness among older adults in the United States during the COVID-19 pandemic. *JAMA internal medicine*, 180(10), 1389-1391.
- De Main AS, Xie B, Shiroma K, Yeh T, Davis N, Han X. Assessing the Effects of eHealth Tutorials on Older Adults' eHealth Literacy. *J Appl Gerontol*. 2022;41(7):1675-1685. doi:10.1177/07334648221088281
- Campanozzi LL, Gibelli F, Bailo P, Nittari G, Sirignano A, Ricci G. The role of digital literacy in achieving health equity in the third millennium society: A literature review. *Front Public Health*. 2023;11:1109323. Published 2023 Feb 20. doi:10.3389/fpubh.2023.1109323
- Rodriguez JA, Shachar C, Bates DW. Digital Inclusion as Health Care - Supporting Health Care Equity with Digital-Infrastructure Initiatives. *N Engl J Med*. 2022;386(12):1101-1103. doi:10.1056/NEJMp2115646
- Ramirez AV, Ojeaga M, Espinoza V, Hensler B, Honrubia V. Telemedicine in Minority and Socioeconomically Disadvantaged Communities Amidst COVID-19 Pandemic. *Otolaryngol Head Neck Surg*. 2021;164(1):91-92. doi:10.1177/0194599820947667
- Gonçalves RL, Pagano AS, Reis ZSN, et al. Usability of Telehealth Systems for Noncommunicable Diseases in Primary Care From the COVID-19 Pandemic Onward: Systematic Review. *J Med Internet Res*. 2023;25:e44209. Published 2023 Mar 16. doi:10.2196/44209
- Shaver J. The State of Telehealth Before and After the COVID-19 Pandemic. *Prim Care*. 2022 Dec;49(4):517-530. doi: 10.1016/j.pop.2022.04.002. Epub 2022 Apr 25. PMID: 36357058; PMCID: PMC9035352.