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Research & Policy Brief

Increasing Telehealth Use during the COVID-19 Public Health Emergency and Healthcare Disparities: An Updated Systematic Review

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Background

The COVID-19 public health emergency (PHE) led to a dramatic increase in telehealth use owing to relaxed policies to facilitate healthcare access, but early studies demonstrated variability in telehealth utilization patterns across demographic groups.¹ COVID-19 disproportionately affected communities of color and the socially disadvantaged, highlighting existing disparities in access and quality of care in the U.S. health system.² We previously conducted a systematic review to summarize available evidence from early in the COVID-19 pandemic, and we concluded that most available evidence showed that telehealth did not reduce disparities in access to health care during the PHE.³ The purpose of this *Research & Policy Brief* is to update our search and summarize contemporary data on this question.

Key Findings

- Our previously completed systematic review found little evidence that telehealth reduced disparities during the COVID-19 pandemic.
- Since the prior report, newer studies tested similar demographic strata for an association between telehealth utilization and access to health care.
- Most available evidence still showed that telehealth did not reduce health care disparities, but we found some examples of telehealth interventions targeted to reduce inequity.

Methods

We used the search strategy and methods previously reported for our prior systematic review (PROSPERO CRD42023392678),⁴ and all citations in this update were abstracted by a single reviewer. We conducted a search update in PubMed, Embase, Cochrane Central Register of Controlled Trials, CINAHL, Telehealth.HHS.gov, and the Rural Health Research Gateway on July 5, 2023, to find references published since the original search on December 9, 2022, using the concepts of telehealth, COVID-19, health equity, and health care access. Our search terms have been previously published on SearchRxiv.⁵

Findings

Of the 523 references in our updated search, 32 met final inclusion criteria for the study. Most studies were retrospective cohort studies using before-after methodology, and telehealth utilization was the most common study outcome. Compared to our initial search, more of the papers included in this search focused on total health care utilization (instead of telehealth-only utilization), but overall, conclusions were similar. **Table 1** summarizes the evidence collated in this review.

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Phan, 2023 ²⁴	health system in Mid-	sectional time	Feb 2021	Telehealth visits								
	Atlantic region)	series design										
Pritchett,	US (Single multiregional cancer practice)	Cross-	July 2019- Aug 2021									
202325		sectional		Telehealth visits								
2023		retrospective										\square
Sadauskas,	US (Single academic health system in Mid-	Retrospective cross-		Video vs. audio-								
				only telehealth	L							
2023 ²⁶	Atlantic)	sectional design	Dec 2021									
Savira, 2023 ²⁷	Australia (Medicare	Retrospective	July 2019-								-	
	beneficiaries)	cohort study	June 2021	Telehealth visits								
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2023 ²⁸		cohort study		chronic pain								
Shaikh,	beneficiaries with	Interrupted	2013-2020									
				Telehealth use	L							
2023 ²⁹	hepatopancreatic	time series										
Shao, 2023 ³⁰	US (Medicaid	Interrupted	Jan 2018-	Telehealth								\square
Jna0, 2023		time series	Aug 2021	utilization								\square
Tewari, 2023 ³¹	US (Single fertility clinic in	Retrospective	Jan 2019-	Telehealth								
	Onio)	cohort study	June 2021	utilization								
Tisdale,	US (VHA, national),	Retrospective	Jan 2019-	Telehealth								
2022 ³²	cardiology visits	cohort study	Mar 2021	utilization				_				
Wagner,	UK (Single tertiary Re	Retrospective	Jan 2019-	Attendance at								
202333	ophthalmology practice)	cohort study	Oct 2021 Jan 2020-	telehealth								
Weber,				appointment Video and audio-							—	┩┦
weber, 2023 ³⁴	US (Single federally qualified health center in	Before-after cohort study	Jan 2020- June 2021	video and audio- only telehealth								
Zuzan Wiefels,	US (Single health system	Retrospective	Jan 2019-	Telehealth								╉┦
2023 ³⁵	in Southeast)	cohort study	May 2021	utilization								
Zacher, 2023 ³⁶	US (Single health system	Retrospective		Telehealth visits								┛┦
	in Colorado)	cohort study	May 2020									
Zawada,	US (Optum Labs Data	Before-after	March 2019-	Telehealth								┩┦
2023 ³⁷	Warehouse)	cohort study	Dec 2020	utilization								
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Discussion

This updated systematic review revealed similar findings to our initial systematic review, although more studies were identified in this updated search (48 references in initial search, with an additional 32 references in this search). Telehealth utilization, in aggregate, increased more slowly among disadvantaged groups, such as older, more rural, Black, and economically disadvantaged populations than in less disadvantaged populations over the course of the PHE. This finding was most pronounced in single-center or single health system studies, but we observed isolated examples of specific programs dedicated to reducing disparities through targeted telehealth interventions that were effective.

In our updated systematic review, we also identified that the range of outcomes was somewhat broader. Whereas early papers studied primarily telehealth use, papers in this updated search compared overall health care utilization. In several of these papers, inequality in telehealth access was partially tempered with increased in-person health care utilization—especially in later stages of the PHE. This finding is encouraging because it suggests that there is potential for initial disparities in access to novel care delivery methods to ameliorate over time, even though underlying disparities in access to in-person traditional care persist.⁴ This observation reinforces our previous conclusion that telehealth, in aggregate, did not act to reduce existing disparities in access to care.

In conclusion, social vulnerability remains a risk factor for delayed or avoided telehealth utilization. Future studies of telehealth dissemination should continue to focus on disparities and the role of telehealth system design and policies in reducing those disparities. The COVID-19 PHE represents a time of dramatic health system innovation, and the lessons learned from that experience will continue to inform telehealth policy and application in the years to come.

Notes

- Lee EC GV, Enogieru I, Smith S, Samson LW, Conmy AB, Lew ND. Updated National Survey Trends in Telehealth Utilization and Modality (2021-2022). (Research Report No HP-2023-09). Washington DC: Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services. 2023.
- 2. Magesh S, John D, Li WT, et al. Disparities in COVID-19 Outcomes by Race, Ethnicity, and Socioeconomic Status: A Systematic-Review and Meta-Analysis. JAMA Netw Open. Nov 1 2021;4(11):e2134147.
- 3. Ternes S, Lavin L, Vakkalanka JP, Healy HS, Merchant KAS, Ward MM, Mohr NM. The role of increasing synchronous telehealth use during the COVID-19 pandemic on disparities in access to healthcare: A systematic review [in press]. J Telemed Telecare. 2024. doi: 10.1177/1357633X241245459
- 4. Vakkalanka JP, Mohr N, Ward M, Healy H, Merchant K, Ternes S, et al. Evaluation of telehealth access and utilization for health care during the COVID-19 pandemic. PROSPERO CRD42023392678; 2023.
- Ternes S, Lavin L, Vakkalanka JP, Healy HS, Merchant KAS, Ward MM, et al. The role of increasing telehealth use during the COVID-19 pandemic on disparities in access to healthcare: A systematic review, https://doi.org/10.1079/searchRxiv.2023.00402; https://doi.org/10.1079/searchRxiv.2023.00403; https://doi.org/10.1079/searchRxiv.2023.00401; https://doi.org/10.1079/searchRxiv.2023.00404; 2023.
- Adhikari S, Titus AR, Baum A, Lopez P, Kanchi R, Orstad SL, Elbel B, Lee DC, Thorpe LE, Schwartz MD. Disparities in routine healthcare utilization disruptions during COVID-19 pandemic among veterans with type 2 diabetes. BMC Health Serv Res. 2023;23(1):41.
- 7. Alishahi ML, Sevick C, Mathieu S, Everhart R, Gritz M. No-show rates for telemedicine versus in-person appointments during the COVID-19 pandemic: Implications for Medicaid populations. J Ambul Care Manage. 2022;45(4):332-40.
- 8. Callison K, Anderson A, Shao Y, LaVeist TA, Walker B. Disparities in telemedicine use among Louisiana Medicaid beneficiaries during the COVID-19 pandemic. Med Care. 2023;61:S70-s6.
- 9. D'Amico R, Schnell PM, Foraker R, Olayiwola JN, Jonas DE, Brill SB. The Evolution of primary care telehealth disparities during COVID-19: Retrospective cohort study. J Med Internet Res. 2023;25:e43965.
- 10. Erikson C. Telehealth use and access to care for underserved populations before and during the COVID-19 pandemic. J Health Care Poor Underserved. 2023;34(1):132-45.
- 11. Gidwani R, Uscher-Pines L, Kofner A, Whaley CM. Differences in telehealth during COVID-19 between commercial and Medicaid enrollees. Am J Manag Care. 2023;29(1):19-26.
- 12. Goldenthal S, Posid T, Heh V, Denis-Diaz D, Asif H, Arnold C, Gold H, Ndumele A, Amin S, Lierz M, Xu V, Cronin T, Khuhro A, Alshami O, Lee C. Evaluation of bladder cancer patient's utilization of urologic telehealth services. J Urol. 2023;209:e137.
- 13. Jamison S, Zheng Y, Nguyen L, Khan FA, Tumin D, Simeonsson K. Telemedicine and disparities in visit attendance at a rural pediatric primary care clinic during the COVID-19 pandemic. J Health Care Poor Underserved. 2023;34(2):535-48.
- 14. Kalwani N, Osmanlliu E, Parameswaran V, Qureshi L, Dash R, Scheinker D, Rodriguez F. Persistent sociodemographic disparities in cardiovascular telemedicine use during the COVID-19 pandemic. J Am Coll Cardiol. 2023;81(8):2287.
- 15. Lee JS, Lowe Beasley K, Schooley MW, Luo F. Trends and costs of US telehealth use among patients with cardiovascular disease before and during the COVID-19 pandemic. J Am Heart Assoc. 2023;12(4):e028713.
- 16. Leung LB, Yoo C, Chu K, O'Shea A, Jackson NJ, Heyworth L, Der-Martirosian C. Rates of Primary Care and Integrated Mental Health Telemedicine Visits Between Rural and Urban Veterans Affairs Beneficiaries Before and After the Onset of the COVID-19 Pandemic. JAMA Netw Open. 2023;6(3):e231864.
- 17. Lucas R, Kahn N, Bocek K, Tordoff DM, Karrington B, Richardson LP, Sequeira GM. Telemedicine utilization among transgender and gender-diverse adolescents before and after the COVID-19 pandemic. Telemed J E Health. 2023. 29(9):1304-11.

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- Macalino AJ, Porter RS, Smith L, Wang H, Levin AV. A study of disparities in access to genetic care pre- and post-pandemic. Am J Med Genet A. 2023;191(7):1704-10.
- 19. Morgan Z, Bazemore A, Dai M, Peterson L. Racial and ethnic disparities in access to primary care during COVID-19. Ann Fam Med. 2022;20(20 Suppl 1):2790.
- O'Shea AMJ, Howren MB, Mulligan K, Haraldsson B, Shahnazi A, Kaboli PJ. Quantifying the digital divide: Associations of broadband internet with tele-mental health access before and during the COVID-19 pandemic. J Gen Intern Med. 2023. 38 (Suppl 3):832-40.
- 21. Owolo E, Petitt Z, Rowe D, Luo E, Bishop B, Poehlein E, Green CL, Cook C, Goodwin CR, Erickson M. Sociodemographic trends in telemedicine visit completion in spine patients during the COVID-19 pandemic. Spine (Phila Pa 1976). 2023;48(21):1500-07.
- 22. Palzes VA, Chi FW, Metz VE, Campbell C, Corriveau C, Sterling S. COVID-19 pandemic-related changes in utilization of telehealth and treatment overall for alcohol use problems. Alcoholism: Clinical and Experimental Research. 2022;46(12):2280-91.
- 23. Park S, Walker B, Anderson A, Shao Y, Callison K. Telemedicine use by age in Louisiana Medicaid during COVID-19: claims-based longitudinal analysis. J Med Internet Res. 2023;25;e46123.
- 24. Phan TT, Enlow PT, Lewis AM, Arasteh K, Hildenbrand AK, Price J, Schultz CL, Reynolds V, Kazak AE, Alderfer MA. Persistent disparities in pediatric health care engagement during the COVID-19 pandemic. Public Health Rep. 2023;138(4):633-44.
- 25. Pritchett JC, Borah BJ, Dholakia R, Moriarty JP, Ahn HH, Huang M, Khera N, Wilshusen L, Dronca RS, Ticku J, Leppin AL, Tilburt JC, Paludo J, Haddad TC. Patient- and provider-level factors associated with telehealth utilization across a multisite, multiregional cancer practice from 2019 to 2021. JCO Oncol Pract. 2023:Op2300118.
- 26. Sadauskas L, Commodore-Mensah Y, Wu C, Taylor CO, Epstein JA, Stackhouse BK, Hasselfeld BW, Hughes HK. Individual- and neighborhood-level disparities in audio-only telemedicine utilization across a large academic health system [in press]. Telemed J E Health. 2023.
- Savira F, Orellana L, Hensher M, Gao L, Sanigorski A, Mc Namara K, Versace VL, Szakiel J, Swann J, Manias E, Peeters A. Use of general practitioner telehealth services during the COVID-19 pandemic in regional Victoria, Australia: Retrospective analysis. J Med Internet Res. 2023;25:e39384.
- 28. Sepsey AM, Sokol OE, Huestis SE, Bhandari RP. Bridging access to pediatric pain care: Telehealth utilization. Clin J Pain. 2023.
- Shaikh CF, Woldesenbet S, Munir MM, Moazzam Z, Endo Y, Alaimo L, Azap L, Yang J, Katayama E, Lima HA, Dawood Z, Pawlik TM. Utilization of telemedicine among Medicare beneficiaries undergoing hepatopancreatic surgery during the COVID-19 pandemic. J Gastrointest Surg. 2023:1-10.
- 30. Shao Y, Shi L, Nauman E, Price-Haywood E, Stoecker C. Trends and disparities in telehealth use among Louisiana Medicaid beneficiaries with type 2 diabetes. Diabetes Obes Metab. 2023;25(9):2680-88.
- 31. Tewari S, Coyne KD, Weinerman RS, Findley J, Kim ST, Flyckt RLR. Racial disparities in telehealth use during the coronavirus disease 2019 pandemic. Fertil Steril. 2023;120(4):880-9.
- 32. Tisdale RL, Ferguson J, Van Campen J, Greene L, Sandhu AT, Heidenreich PA, Zulman DM. Disparities in virtual cardiology visits among Veterans Health Administration patients during the COVID-19 pandemic. JAMIA Open. 2022;5(4):00ac103.
- Wagner SK, Raja L, Cortina-Borja M, Huemer J, Struyven R, Keane PA, Balaskas K, Sim DA, Thomas PBM, Rahi JS, Solebo AL, Kang S. Determinants of non-attendance at face-to-face and telemedicine ophthalmic consultations. Br J Ophthalmol. 2023:bjo-2022-322389.
- 34. Weber E, Miller SJ, Shroff N, Beyrouty M, Calman N. Recent telehealth utilization at a large Federally Qualified Health Center System: Evidence of disparities even within telehealth modalities. Telemed J E Health. 2023;29(11):1601-12.
- 35. Wiefels MD, Gmunder KN, Ruiz JW. Patient income level and health insurance correlate with differences in health care utilization during the COVID-19 pandemic. J Public Health Res. 2023;12(1):22799036231160624.
- 36. Zacher NC, Pickett KL, Schmiege SJ, Olson CA, Bruckner AL, Kohn LL. Retrospective chart review of patient socioeconomic status and language preference associated with live video telehealth in a pediatric dermatology practice. Pediatr Dermatol. 2023; 40(4):651-4.
- 37. Zawada S, Inselman J, Maddux J, Jeffery M, Rank M. Increased telehealth use and reduced severe exacerbations for asthma patients during the COVID-19 pandemic. J Allergy Clin Immunol. 2023;151(2):AB164.

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