Journal of the American Geriatrics Society

Unmet health-related needs of community-dwelling older adults during COVID-19 lockdown in a diverse urban cohort

Journal:	*Journal of the American Geriatrics Society*
Manuscript ID	JAGS-2265-CI-Dec-21.R2
Wiley - Manuscript type:	Clinical Investigation
Date Submitted by the Author:	08-Jul-2022
Complete List of Authors:	Perry, Laura; University of California San Francisco Department of Medicine, Medicine-Geriatrics Scheerens, Charlotte; Universiteit Gent, Department of Public Health and Primary Care; University of California San Francisco Department of Medicine, Medicine-Geriatrics; Beth Israel Deaconess Medical Center, Institute for Lung Health Greene, Meredith; University of California San Francisco Department of Medicine, Medicine-Geriatrics Shi, Ying; University of California San Francisco Department of Medicine, Medicine-Geriatrics Onion, Zoe; University of California San Francisco School of Medicine Bayudan, Evamae; University of California San Francisco School of Medicine Stern, Rachel; Ventura County Health Care Agency, Ambulatory Care Gilissen, Joni; UCSF, Atlantic Fellows for Equity in Brain Health, Global Brain Health Institute (GBHI); Vrije Universiteit Brussel, End-of-Life Care Research Chodos, Anna; University of California San Francisco Department of Medicine, Medicine-Geriatrics
Key Words:	COVID-19, shelter-in-place, unmet health needs, geriatrics, equity

Unmet health-related needs of community-dwelling older adults during COVID-19 lockdown in a diverse urban cohort

Laura Perry, MD[1], Charlotte Scheerens, PhD, [1,2,5], Meredith Greene, MD[1], Ying Shi, PhD[1], Zoe Onion, BA[1], Evamae Bayudan, BS[1], Rachel J Stern, MD[6] Joni Gilissen[3,4], Anna H. Chodos MD, MPH[1,3]

[1]Department of Medicine, Division of Geriatrics, University of California San Francisco, San Francisco, California, United States

[2]Department of Public Health and Primary care, Universiteit Gent, Gent, Belgium

[3]Atlantic Fellowship for Equity in Brain Health, Global Brain Health Institute, San Francisco, California, United States

[4]End-of-Life Care Research Group, Dept Family Medicine & Chronic Care, Vrije Universiteit Brussel (VUB), Brussels, Belgium

[5]Institute for Lung Health, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, United States

[6] Ambulatory Care, Ventura County Healthcare Agency

Corresponding Author: Laura Perry, MD, 4150 Clement Street, Building 208, San Francisco, CA 94121, 415-221-4810, ext 24229, laura.perry@ucsf.edu, @LPerrytheGeriMD

Alternate Corresponding Author: Anna H. Chodos, anna.chodos@ucsf.edu

Abstract word count: ~~300~~298

Main text word count: ~~2547~~3158

Funding sources and related paper presentations: COVID-19 Solidarity Grant, Atlantic Institute and Rhodes Trust. Oral presentation at the American Geriatrics Society, Annual Meeting, May 13, 2021 as “Clinical Outreach to Older Adults in the Community During COVID-19: a Description of Unmet Health-Related Needs.”

Running head: Unmet Health Related Needs During COVID

We certify that this work is novel or confirmatory of recent novel clinical research.

The potential impact of this research on clinical care or health policy includes the following: The disruption of services in the context of a public health emergency creates substantial health-related needs among older adults in the community, with non-English speakers disproportionately affected; this should be a core consideration of the on-going pandemic and for future crisis responses.

Keywords: *COVID-19, shelter-in-place, unmet health needs, geriatrics, equity*

ABSTRACT:

BACKGROUND: Shelter-in-place orders during the COVID-19 pandemic created unmet health-related and access-related needs among older adults~~, such as the ability to obtain medications or access a video visit~~. We sought to understand the prevalence of these needs among community dwelling older adults.

METHODS: We performed a retrospective chart review of pandemic-related outreach calls to older adults between March and July 2020 at four urban, primary care clinics: a home-based practice, a safety-net adult medicine clinic, an academic geriatrics practice, and a safety-net clinic for adults living with HIV. Participants included those 60 or older at three sites, and those 65 or older with a chronic health condition at the fourth. We describe unmet health-related needs (the need for medication refills, medical supplies, or food) and access-related needs (ability to perform a telehealth visit, need for a call back from the primary care provider). We performed bivariate and multivariate analyses to examine the association between unmet needs and demographics, medical conditions, and health care utilization.

RESULTS: Sixty-two percent of people had at least one unmet need. Twenty-six percent had at least one unmet health-related need; 14.0% needed medication refills, 12.5% needed medical supplies, and 3.0% had food insecurity. Among access-related needs, 33% were not ready for video visits, and 36.4% asked for a return call from their provider. Prevalence of any unmet health-related need was the highest among Asian vs. white (36.4% vs. 19.1%) and in the highest vs. lowest poverty zip codes (30.8% vs. 18.2%). Those with diabetes and COPD had higher unmet health-related needs than those without, and there was no change in health care utilization.

CONCLUSIONS: During COVID, we found that disruptions in access to services created unmet needs among older adults, in particularly for those who self-identified as Asian. We must foreground the needs of this older population group in the response to future public health crises.

KEY POINTS

- One quarter of community-dwelling older adults had an unmet health-related need (needing medicine, medical supplies, or food) when health care and social services were limited in the context of the pandemic.
- Asian older adults and those living in neighborhoods with higher poverty had the highest rates of ~~more~~ unmet needs in this urban study.

WHY DOES THIS PAPER MATTER?

The results of this study demonstrate the real-world impacts of shelter-in-place orders on vulnerable older adults living in the community. It provides evidence that specific populations had greater needs, specifically those who were non-English speakers, those who lived in zip codes with higher poverty levels, and those with both Medicare and Medicaid. We intend that readers of this paper can cite this data when having discussions with local governments, particularly public health and social service agencies, about the need to create contingency plans to meet the needs of older adults should future epidemics or other crises necessitate shelter-in-place orders.

INTRODUCTION

The COVID-19 pandemic has profoundly impacted older adults, with severe illness and death being far more common in older persons than younger ones.[1] In the spring of 2020, many U.S. municipalities enacted shelter-in-place orders to limit its spread. The shutdown of medical and social services that older adults rely on created a second set of challenges in the day-to-day lives of older adults as unmet health-related and social needs soared.[2–6] Medical practices stepped up to fill an unmet need and perform emergency triage of their patients' needs during the initial shutdown.

Health care providers offered telehealth and other remote communication solutions to maintain access for their people. However, technology has not been adapted to older adults, who as a result use technology less than younger adults at baseline and are more likely to have sensory and cognitive impairments that decrease their ability to use telehealth resources as currently designed.[7] Many were unable to navigate the push to telehealth and remote technology.[8,9]

Shortly after shelter-in-place orders were enacted, several primary care practices in our area identified that many older patients were lacking in basic needs, and performed outreach calls to identify these needs and connect patients to resources when needed. Patients were specifically asked about missing medication refills, medical supplies, groceries, and caregivers, as these were needs that were identified as frequently being disrupted, potentially life-threatening, and areas in which providers or social services could likely intervene. During this time, practices prepared to change how care would be delivered, from almost exclusively in-person to primarily via phone or telehealth. In these same outreach calls, patients and

116 families were asked about telehealth readiness and desire for a follow-up call from
117 the provider, to triage when and how high-risk patients would be seen.

118 While other studies have focused on social isolation,[10] well-being,[11-12] and falls,[13] few
119 have described how lockdowns impacted the day-to-day care needs of vulnerable
120 older adults. One study evaluated needs for assistance with activities of daily living
121 and revealed gaps between needs for assistance and receipt of that assistance that
122 widened during the COVID-19 pandemic in the United States.[14] To better describe
123 this gap, we performed a retrospective chart review of the outreach calls performed
124 by these primary care clinics. In this paper, we describe the prevalence of unmet
125 health-related needs during shelter-in-place among a cohort of older adult patients in
126 primary care and their relationship to demographic factors, health conditions, and
127 health care utilization.

128

METHODS

Setting

Shelter-in-place orders took effect on March 16, 2020. Due to the disruption in services, four adult or geriatrics-focused primary care practices affiliated with the University of California at San Francisco and the San Francisco Health Network performed outreach phone calls using volunteers and staff after the implementation of shelter-in-place orders. The four clinics included were: 1) an academic home-based primary care practice, 2) an academic geriatric outpatient clinic, 3) a safety net adult medicine clinic, and 4) a safety net clinic for adults living with HIV. Clinical leaders of each practice guided callers how to ~~Outreach calls included protocols for responding~~ respond to identified needs, e.g. creating a medication refill request if needed; clinical leaders were also available to assist callers if questions arose.

Participants

The cohort includes those patients that were actively empaneled at their respective clinics and successfully received an outreach call. At the home-based primary care practice and academic geriatrics practice, all community-dwelling people over age 60 were called. At the adult medicine clinic, which had a larger patient population and slightly less staff capacity to make calls, people 65 and older without a recent visit (within March 2020) and with a serious condition (chronic obstructive pulmonary disease, diabetes, or congestive heart failure) were called. In the clinic for those living with HIV clinic, they included all adults over age 60. All clinics called until they reached their patients, except for the adult medicine clinic which called a maximum of two times. We excluded patients who ~~who~~ were not reached.

Measurements

Calls were made between March 26, 2020 and July 28, 2020 and documented in the medical record. We abstracted outreach call responses from the electronic medical record retrospectively. Because the scripts and protocols varied slightly between sites, we report data from questions that were shared between sites.

First, patients were asked about health-related needs: if they had 1) adequate medication refills, 2) adequate medical supplies for their needs (e.g. wound care dressings, oxygen, etc.), and 3) access to food. Second, two additional access-related needs were assessed: 1) their ability to perform future telehealth visits with their clinicians ~~at the time of the call~~, and 2) whether they wanted a follow-up call from their primary care provider. A question about caregiver availability was included in the initial outreach phone call, but due to variability in how the question was asked between sites, that data was unable to be abstracted from the EMR and thus is not reported. Additionally, the adult safety net clinic did not ask about telehealth visits, as this clinic did not implement telehealth protocols at the time.

Data collection

Via chart review of electronic ~~health~~ medical records, we abstracted data on factors that might affect unmet needs including demographics (age calculated from date of birth, self-identified gender, self-identified race and ethnicity, ZIP code, insurance type, and primary language); we used AskCHIS to obtain zip code-level data on percentage of adults living under the federal poverty level, and stratified zip codes into four quartiles based into those with higher and lower local rates of poverty (<7.5% of adults in the zip code living under the federal poverty level, 7.5-10%, 10.1-12.5%, and >12.5%).[15] We abstracted information about medical conditions that we believed might affect the prevalence of unmet needs or determine the severity of its impact as present or not (hypertension, HIV, diabetes, heart failure, coronary artery

disease, valvular disease, COPD, asthma, other lung diseases, cirrhosis, dementia, depression, history of falls, and urinary incontinence) using the ICD-10 codes listed in Supplementary Table S3; acute care use in the three months before and after the outreach phone calls (defined as urgent care visits, emergency room visits, and hospitalizations); and deaths three months after the outreach phone call.

We abstracted responses to the outreach questions about health-related needs for medication refills (yes/no), for medication supplies (yes/no), or for food (yes/no) at the time of the call. We also abstracted responses to the questions about access-related needs for telehealth visits (there was a need if the patient was unable to switch from ~~an~~scheduled in-person visit~~s~~ to ~~a~~ telehealth visit~~s at the time of the call~~, for any reason), and wanted a follow-up phone call from their provider (yes/no).

Statistical analysis

Descriptive statistics were used to characterize the sample and assess frequencies of unmet needs. Bivariate analysis was performed to report on differences between clinic sites with regard to patient demographic and medical conditions. Bivariate analyses were also done to examine association between demographic characteristics and unmet needs. We set statistical significance at $p<0.05$ (two-sided). Multivariate analysis was performed in mixed-effects models, adjusting for age, gender, clinical site and insurance status. Analyses were performed using SAS 9.4 (SAS Institute, Inc.). All study procedures were approved by the UCSF IRB.

RESULTS

Sample characteristics

Among the four clinic sites, 546 people received an outreach call and were reached successfully, of which 136 (24.9%) were from home-based primary care, 199 (36.5%) from geriatric primary care, 143 (26.2%) from the adult medicine clinic in the

safety net, and 68 (12.5%) from the clinic for adults with HIV. Of all sites, only the adult medicine clinic in the safety net did not reach all their patients; of 702 patients who met criteria for outreach, 326 (46.4%) were reached at all and only 143 (20.4%) completed the full outreach call.

Demographic characteristics overall and across clinic sites are shown in Table 1. A third (32.1%) were between 71 and 80 years old, over half (56.7%) were male, and three quarters (75.8%) were English-speaking. Regarding self-identified race, 46.9% were White, 27.7% were Asian, and 12.3% were Black. Nearly half (46.9%) were dual eligible, insured by both Medicare and Medical (California's Medicaid program). The most prevalent conditions were hypertension (67.2%), lung disease (35.9%), any heart disease (31.3%), depression (30.6%), and diabetes (30.0%).

Unmet needs

During shelter-in-place, 142 (26.0%) people called had at least one unmet health-related need, of which 76 (14.0%) needed medication refills, 66 (12.5%) needed medical supplies, and 16 (3.0%) needed access to food. Of all people who were asked (n=403), 128 (32.9%) were not ready for telehealth visits, and 192 (36.4%) asked for a return call from their primary care provider. In total, 340 (62.3%) people had at least one unmet need. People who received their care from the safety net adult medicine clinic had higher rates of unmet needs than other sites; 47.6% had one or more health-related unmet need. All findings are shown in Figure 1.

Unmet needs by demographics

In the bivariate analyses shown in Table 2, there were differences in the prevalence of unmet health-related needs between age groups, insurance types, self-identified

race, primary language, and poverty at the level of zip code (at statistical significance of $p<0.05$), seen across all clinic sites.

Unmet health-related needs were the highest among self-identified Asian people (36.4%) compared with other racial groups, except for American Indian/Alaska Native (50.0%) for which there were only 2 people in the cohort. Among those identifying as Asian, there was a different prevalence of unmet health-related needs among speakers by Asian languages: Cantonese (57.5%), Vietnamese (50.0%, n=4), Tagalog (44.4%) and Mandarin (36.8%). Among those who identified as Asian and their preferred language was an Asian language, 46.9% (38/81) reported an unmet health-related need, versus 24.3% (17/70) of those who identified as Asian but who preferred English (data not shown in tables).

Among different age groups, the youngest, 61-70, had the highest unmet health-related needs (37.8%). For health-related and access-related needs combined, those between 61-70 years old and 100+ had more unmet needs (71.9% and 75.0%, n=3 for 100+) than those between 71-80 (61.1%), 81-90 (53.4%) and 91-100 years old (64.0%) ($p<0.05$, data not shown).

Among people with both Medicare and MediCal, 33.6% had unmet health-related needs, compared with 12.6% of people with Medicare and private insurance. Those with private insurance only and people without insurance also had high rates of unmet health-related needs (44.4% and 40.0%, respectively), but there were only 9 and 5 people in these cohorts, respectively.

There were also differences by quartile of zip code-level poverty, with more people in each group of increasing quartile of zip-code poverty having more unmet health-related needs: 30.8% in those living in zip codes with the highest rates of poverty vs. 18.2% in those living in zip codes with the lowest rates of poverty.

253

254 **Unmet needs by medical conditions**

255 Of the medical conditions assessed, only for those with the diagnoses of diabetes
256 and COPD was there an association of more unmet health-related needs for people
257 with the condition compared with people without it. Of those with diabetes, 33.5%
258 had an unmet health-related need compared to 22.8% of those without diabetes;
259 39.3% of those with COPD had unmet health-related needs compared to 22.2% of
260 those who did not have COPD (comparison data shown in Supplementary Table S1).

261

262 **Unmet needs and health care utilization**

263 There was a modest decrease in the number of people with an ER visit between the
264 three months before the outreach call (10.3%) and the three months after the
265 outreach call (7.7%), as shown in Supplementary Table S2. Of note, this decrease
266 was most pronounced among the people receiving care from the home-based
267 primary care practice (22.1% pre vs 8.8% post). Rates of hospitalizations and urgent
268 care visits stayed the same. Three people (0.6%) died within three months of the
269 outreach call. There were no differences seen in the rates of acute care utilization
270 based on the presence or absence of unmet needs (data not shown).

271

272 **Multivariate analysis**

273 After adjustment for age, gender, clinical site and insurance status, primary
274 Cantonese speakers had an odds ratio of 4.37 (95% CI 2.01-9.51) of having an
275 unmet need, compared with primary English speakers. This was the only statistically
276 significant association that persisted under multivariate analysis.

277

DISCUSSION

The ripple effects of the COVID pandemic have been wide-reaching throughout all aspects of older adults' lives. San Francisco was relatively spared during the initial surge of COVID pandemic compared with most other comparable-sized cities in the United States; cases and deaths remained overall quite low.[16,17] However, our study presents data on a second, shadow pandemic of unmet needs in the setting of strict stay-at-home orders. In an urban setting with a diverse cohort of patients, about two thirds (62.3%) reported any unmet need. These unmet needs were most pronounced among older adults who were already underserved by virtue of their demographics: those living in zip codes with higher rates of poverty, those with both Medicare and MediCal, and those who received care in the safety net. Additionally, Asian older adults, particularly those whose primary language was Cantonese, reported higher rates of unmet health-related needs than their white counterparts. Finally, people with COPD or diabetes reported higher rates of unmet needs, which we attribute to the unique needs of these conditions that require additional equipment and medications; of note, this was not significant in multivariate analysis.

These unmet needs were a predictable consequence of rapid disruption of regular services for a vulnerable population, and reflect a lack of prior adequate planning to address the fragility of these services.[8,18] Clapp and colleagues evaluated the shadow pandemic of unmet social needs in New York City residents but did not include needs for medications or medical supplies,[19] which older adults are more likely to need than younger ones. San Francisco is often characterized as a city with a robust safety net, but our data shows that older adults had critical needs that were not met by this safety net during shelter-in-place.

While younger, more robust adults are often able to find alternate solutions during times of crisis, older adults who rely on community programs and social services to meet their basic needs are often more vulnerable during times of communal crisis.[8,18] Going forward, pandemic preparedness could better anticipate the needs of vulnerable older adults when addressing the disruption of usual services to mitigate the impact of this crisis on our communities, cities, and counties.

While telehealth increased in primary health care throughout the county, our data suggests limitations of this solution, as more than one-third of older patients who were called indicated they could not perform a telehealth visit. This is consistent with research showing similar unreadiness of older adults for telehealth visits and research on the gender and racial disparities in access to telehealth among older adults in the US. [7,21]

We did not find that unmet needs were associated with increased health care utilization. We hope that our outreach calls and interventions mitigated some of the unmet needs and thus prevented an increase in utilization. It also could be due to care avoidance due to the severe disruption in services, public health messaging to stay away if possible, and patients and caregivers reporting a fear of going to the hospital due to the perceived risk of contracting COVID, as occurred in other parts of California.[22]

Strengths and limitations

This study represents electronic medical record data that was obtained during a time of crisis for clinical purposes. There are limitations of this type of data collection. First, we do not have data on the prevalence of unmet needs prior to shelter-in-place, and thus cannot determine what proportion of these unmet needs were due to the crisis of the moment. Second, not all people at the adult medicine clinic were reached by phone. Thus, our data may not fully represent unmet needs; it is possible those most at risk may not have been reached by phone. Third, our study was limited to a single city and to academic-affiliated clinics. San Francisco had earlier and some of the more stringent lockdown restrictions in the country during the time of this study, and thus results may have been different in other parts of the country. However, strengths include the diversity of our patient population, which mirrors the diversity of the city of San Francisco. Asian Americans have often been overlooked in studies describing disparities during the COVID-19 pandemic; and this study contributes to the literature demonstrating that disparities do exist.[23,24] Another strength is that our data are unique and show health- and access-related unmet needs in an older adult population during lockdown, findings which have not been described elsewhere.

Finally, a significant strength was the outreach calls themselves, which represented a tremendous effort by the practices involved to quickly adapt to meet the needs of their vulnerable patients in a time of crisis. We do not know how our patients would have fared if not for these efforts; we hope that this data demonstrates the glaring need that our practices stepped up to meet. We also hope that this data will be considered by decision makers who shape municipalities' pandemic preparedness

plans, as older adults' needs are complex and require more thorough consideration than previously given.

CONCLUSION

The four primary care practices in this paper acted as first and essential responders to vulnerable older adults in a time of need, stepping outside of the usual scope of practice. In doing so, they identified profound needs that should be a call to action for public health and community safety entities. Older adults commonly experience functional, sensory and cognitive disabilities that impact the ability to connect to resources during times of crisis; this study demonstrates the vulnerability of older adults as a group, and need for additional attention and planning in order to prevent similar crises. COVID-19 has unmasked many areas of vulnerability in the social safety net, and proven that prior methods of crisis preparedness have been inadequate. Future crises will come, and older adults need consideration as much as any other vulnerable group. We call on community leaders to build proactive crisis response plans that prioritize older adults for more targeted assistance.

Conflict of Interest:

All authors have no potential conflicts of interest to declare.

Author Contributions:

Authors LP, MG, CS, RC, JG, AC had a role in conceptualizing and designing the study. Authors LP, CS and YS conducted all data analysis. Author ZO created the data collection database. Authors EB and ZO performed data collection. Authors LP and EB performed data quality assurance. All authors contributed to the interpretation of the data and preparation of the manuscript.

Acknowledgements

SPONSOR'S ROLE

Grant funding came from the COVID-19 Solidarity Grant, provided by the Atlantic Institute and Rhodes Trust.

THANK YOUS

The authors would like to thank the clinics who enthusiastically collaborated with us during this study, Carla Perissinotto, MD, MPH, Courtney Gordon, NP; Pei Chen, MD; Rebecca Sudore MD, Belinda Tang, Emily Reyes, Clarissa Ferguson, Linda Phung, and Janelle Silvis for their contributions to this work.

References

1. Rapp JL, Lieberman-Cribbin W, Tuminello S, Taioli E. Male Sex, Severe Obesity, Older Age, and Chronic Kidney Disease Are Associated With COVID-19 Severity and Mortality in New York City. *Chest*. 2021;159(1):112-115. doi:10.1016/j.chest.2020.08.2065

2. Benfer EA, Wiley LF. Health Justice Strategies To Combat COVID-19: Protecting Vulnerable Communities During A Pandemic. Health Affairs Blog. doi:10.1377/hblog20200319.757883

3. Abrams EM, Szefler SJ. COVID-19 and the impact of social determinants of health. *Lancet Respir Med*. 2020;8(7):659-661. doi:10.1016/S2213-2600(20)30234-4

4. Graham J. For Seniors, COVID-19 Sets Off A Pandemic Of Despair. *Kaiser Health News*. 1. https://khn.org/news/for-seniors-covid-19-sets-off-a-pandemic-of-despair/. Published May 28, 2020. Accessed October 13, 2021.

5. Krendl AC, Perry BL. The Impact of Sheltering in Place During the COVID-19 Pandemic on Older Adults' Social and Mental Well-Being. Isaacowitz DM, ed. *J Gerontol Ser B*. 2021;76(2):e53-e58. doi:10.1093/geronb/gbaa110

6. Steinman MA, Perry L, Perissinotto CM. Meeting the Care Needs of Older Adults Isolated at Home During the COVID-19 Pandemic. *JAMA Intern Med*. 2020;180(6):819. doi:10.1001/jamainternmed.2020.1661

7. Lam K, Lu AD, Shi Y, Covinsky KE. Assessing Telemedicine Unreadiness Among Older Adults in the United States During the COVID-19 Pandemic. *JAMA Intern Med*. 2020;180(10):1389. doi:10.1001/jamainternmed.2020.2671

8. *Closing the Gaps: Advancing Disaster Preparedness, Response and Recovery for Older Adults*. American Red Cross; 2020. Accessed October 13, 2021. https://www.redcross.org/content/dam/redcross/training-services/scientific-advisory-council/253901-03%20BRCR-Older%20Adults%20Whitepaper%20FINAL%201.23.2020.pdf

9. Brewster AL, Wilson TL, Kunkel SR, Markwood S, Shah TB. To Support Older Adults Amidst The COVID-19 Pandemic, Look to Area Agencies On Aging. Health Affairs Blog. Published April 8, 2020. https://www.healthaffairs.org/do/10.1377/hblog20200408.928642/full/

10. Ankuda CK, Kotwal A, Reckrey J, Harrison KL, Ornstein KA. The Experience of Homebound Older Adults During the COVID-19 Pandemic. *J Gen Intern Med*. 2022; Epub ahead of print. doi: 10.1007/s11606-021-07361-9.

11. Holaday LW, Oladele CR, Miller SM, Dueñas MI, Roy B, Ross JS. Loneliness, sadness, and feelings of social disconnection in older adults during the COVID-19 pandemic. *J Am Geriatr Soc.* 2022;70(2):329-340. doi: 10.1111/jgs.17599.

12. Winship JM, Gendron T, Waters L, Chung J, Battle K, Cisewski M, Gregory M, Sargent L, Zanjani F, Slattum P, Mackiewicz M, Diallo A, Ford G, Falls K, Price ET, Parsons PL; VCU iCubed Health and Wellness in Aging Transdisciplinary

Core8. COVID in Context: The Lived Experience of Richmond's Low-Income Older Adults. *Gerontol Geriatr Med.* 2022;8:23337214221079208. doi: 10.1177/23337214221079208.

13. McIntyre CC, Prichett L, McNabney MK. Impact of COVID-19 Stay-At-Home Restrictions on Falls in One Community of High-Risk Older Adults. *J Appl Gerontol*. 2022; Epub ahead of print. doi: 10.1177/07334648211073607.

14. Chen S, Jones LA, Jiang S, Jin H, Dong D, Chen X, Wang D, Zhang Y, Xiang L, Zhu A, Cardinal RN. Difficulty and help with activities of daily living among older adults living alone during the COVID-19 pandemic: a multi-country population-based study. *BMC Geriatr*. 2022;22(1):181. doi: 10.1186/s12877-022-02799-w.

15. *AskCHIS Neighborhood Edition. Living in Poverty (<100%FPL) (18+) Comparing Zip Codes*. 9. UCLA Center for Health Policy Research, Los Angeles, CA Accessed February 19, 2021. Available at: https://askchisne.ucla.edu

16. *American Cities and Covid-19*. City Mayors Research Accessed August 12, 2021. http://www.citymayors.com/coronavirus/us-cities-covid-19-cases-2.html

17. Hwang K. How San Francisco's coronavirus case rate compares to other U.S. cities right now. *San Francisco Chronicle*. https://www.sfchronicle.com/bayarea/article/How-San-Francisco-s-coronavirus-case-rate-15832776.php. Published December 28, 2020.

18. Aldrich N. CDC's Disaster Planning Goal: Protect Vulnerable Older Adults. Accessed October 18, 2021. https://www.cdc.gov/aging/pdf/disaster_planning_goal.pdf

19. Clapp J, Calvo-Friedman A, Cameron S, Kramer N, Kumar SL, Foote E, Lupi J, Osuntuyi O, Chokshi DA. The COVID-19 Shadow Pandemic: Meeting Social Needs For A City In Lockdown. *Health Aff (Millwood)*. 2020;39(9):1592-1596. doi: 10.1377/hlthaff.2020.00928.

20. Corlette S, Berenson R, Wengle E, Lucia K, Thomas T. *Impact of the COVID-19 Pandemic on Primary Care Practices*. The Urban Institute, Robert Wood Johnson Foundation; 2021. Accessed October 18, 2021. https://www.pcpcc.org/2021/02/11/impact-covid-19-pandemic-primary-care-practices

21. Ryskina KL, Shultz K, Zhou Y, Lautenbach G, Brown RT. Older adults' access to primary care: Gender, racial, and ethnic disparities in telemedicine. *J Am Geriatr Soc*. 2021;69(10):2732-2740. doi:10.1111/jgs.17354

22. Wong LE, Hawkins JE, Langness S, Murrell KL, Sammann A. Where Are All the Patients? Addressing Covid-19 Fear to Encourage Sick Patients to Seek Emergency Care. *NEJM Catal*. Published online May 14, 2020. doi:10.1056/CAT.20.0193

23. Yee A. COVID's Outsize Impact on Asian Americans Is Being Ignored. *Sci Am*. Published online May 6, 2021.

24. Eberly LA, Kallan MJ, Julien HM, Haynes N, Khatana SAM, Nathan AS, Snider C, Chokshi NP, Eneanya ND, Takvorian SU, Anastos-Wallen R, Chaiyachati K, Ambrose M, O'Quinn R, Seigerman M, Goldberg LR, Leri D, Choi K, Gitelman Y, Kolansky DM, Cappola TP, Ferrari VA, Hanson CW, Deleener ME, Adusumalli S. Patient Characteristics Associated With Telemedicine Access for Primary and Specialty Ambulatory Care During the COVID-19 Pandemic. *JAMA Netw Open.* 2020 Dec 1;3(12):e2031640. doi: 10.1001/jamanetworkopen.2020.31640.

Supplemental material includes three tables:

Table S1: Participants' unmet needs stratified by presence or absence of medical conditions

Table S2: Participants' health care utilization before and after outreach call by clinic site

Table S3. ICD-10 codes used by medical condition

Table 1. Participant characteristics

	Total (N=546)
Age, n (%)	
61-70 years old	135 (24.7)
71-80 years old	175 (32.1)
81-90 years old	146 (26.7)
91-100 years old	86 (15.8)
100+ years old	4 (0.7)
Race, n (%)	
American Indian or Alaska native	2 (0.4)
Asian	151 (27.7)
Black	67 (12.3)
White	256 (46.9)
Native Hawaiian /Pacific Islander	5 (0.9)
Other	62 (11.4)
Declined to answer	1 (0.2)
Ethnicity, n (%)	
Non-Hispanic	467 (87.1)
Hispanic	69 (12.9)
Primary language, n (%)	
English	413 (75.8)
Spanish	42 (7.7)
Mandarin	19 (3.5)
Cantonese	40 (7.3)
Vietnamese	4 (0.7)
Tagalog	9 (1.7)
Russian	3 (0.6)
Other	15 (2.8)
Gender, n (%)	
Female	233 (42.9)
Male	308 (56.7)
Transgender	2 (0.4)
Insurance status, n (%)	
Medicare only	82 (15.0)
Medicare and MediCal	256 (46.9)
Medicare and private	175 (32.1)
MediCal only	18 (3.3)
Private only	9 (1.7)
Uninsured	5 (0.9)
Adults (%) in poverty within zip code, n (%)**	
<7.5%	143 (26.2)
7.5-10%	183 (33.5)
10.1-12.5%	100 (18.3)
>12.5%	120 (21.9)
Medical conditions, n (%)	
Hypertension	367 (67.2)
Diabetes	164 (30.0)
Heart Failure	103 (18.9)
Coronary Artery Disease	99 (18.1)
Valvular Disease	40 (7.3)
COPD	122 (22.3)
Asthma	61 (11.2)
Another Lung Disease	36 (6.6)
Cirrhosis	20 (3.7)
HIV	68 (12.5)
Dementia	96 (17.6)
Depression	167 (30.6)
History of Falls	112 (20.5)
Urinary Incontinence	99 (18.1)

**Divided into four roughly equal quartiles by the authors.

Table 2. Association between unmet health-related needs and demographics

Demographics Total N=546 (100%)	**Had any health-related unmet need*** N=142	**Had no health-related unmet needs*** N=404	**P-value****
Age, n (%)***			<0.001
61-70 years old	51 (37.8)	84 (62.2)	
71-80 years old	48 (27.4)	127 (72.6)	
81-90 years old	19 (13.0)	127 (87.0)	
91-100 years old	23 (26.7)	63 (73.3)	
100+ years old	1 (25.0)	3 (75.0)	
Race, n (%)***			0.002
American Indian or Alaska native	1 (50.0)	1 (50.0)	
Asian	55 (36.4)	96 (63.6)	
Black	16 (23.9)	51 (76.1)	
White	49 (19.1)	208 (80.9)	
Native Hawaiian /Pacific Islander	0 (0.0)	5 (100.0)	
Other	20 (31.3)	44 (68.8)	
Ethnicity, n (%)***			0.77
Hispanic	19 (27.5)	50 (72.5)	
Non-Hispanic	119 (25.5)	348 (74.5)	
Primary language, n (%)***			<0.001
English	87 (21.1)	326 (78.9)	
Spanish	12 (28.6)	30 (71.4)	
Mandarin	7 (36.8)	12 (63.2)	
Cantonese	23 (57.5)	17 (42.5)	
Vietnamese	2 (50.0)	2 (50.0)	
Tagalog	4 (44.4)	5 (55.6)	
Russian	1 (33.3)	2 (66.7)	
Other	5 (33.3)	10 (66.7)	
Gender, n (%)***			0.96
Female	62 (26.6)	171 (73.4)	
Male	80 (26.0)	228 (74.0)	
Transgender	0 (0.0)	2 (100.0)	
Insurance status, n (%)***			<0.001
Medicare only	22 (26.8)	60 (73.2)	
Medicare and MediCal	86 (33.6)	170 (66.4)	
Medicare and private	22 (12.6)	153 (87.4)	
MediCal only	6 (33.3)	12 (66.7)	
Private only	4 (44.4)	5 (55.6)	
Uninsured	2 (40.0)	3 (60.0)	
Percent of adults in zip code living in poverty, n (%)***			0.04
<7.5%	26 (18.2)	117 (81.8)	
7.5-10%	46 (25.1)	137 (74.9)	
10.1-12.5%	33 (33.0)	67 (67.0)	
>12.5%	37 (30.8)	83 (69.2)	

*Unmet health-related needs included medication refills, medical supplies and food.
**Chi-square test of Independence results or Fisher's Test, significance level set at 0.05; Data on gender, race and ethnicity were all self-reported, collected at the time of registration with the clinical practice. These were existing categories in the EMR. P-values represent difference between subgroups by demographic.
***Percentages listed are row percentages.

Figure 1. Participants' unmet needs by clinic site

Two bar graphs are given. From left to right on first bar graph:

Needs medication refills

Needs medical supplies

Food insecurity

Any unmet need

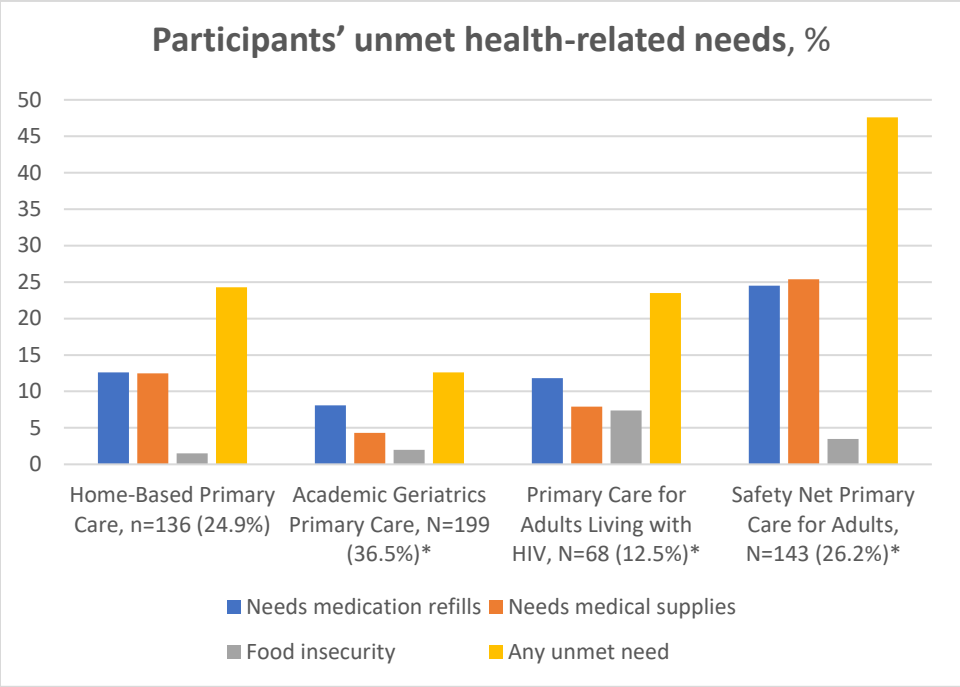
From left to right on second bar graph:

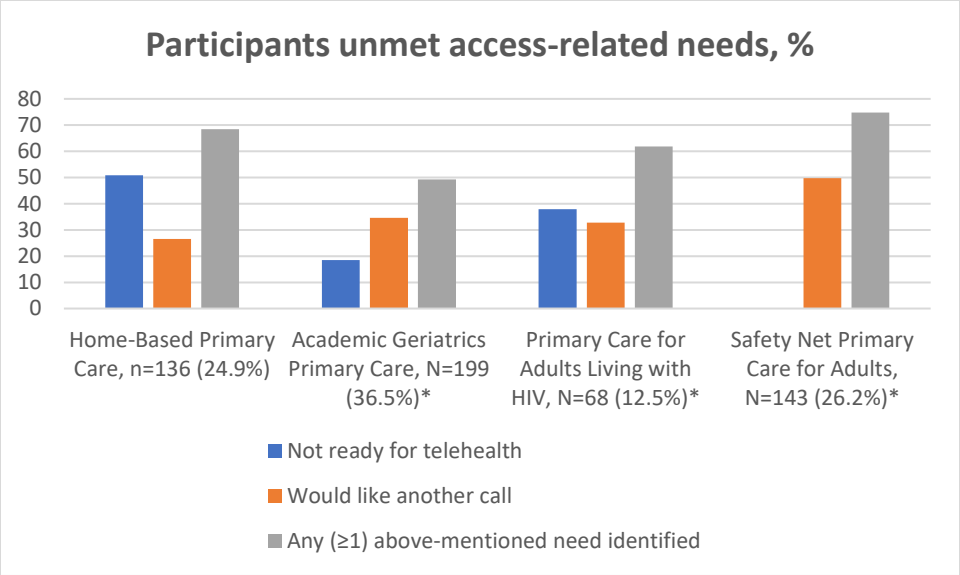
Not ready for telehealth

Would like another call

Any (≥1) above-mentioned need identified

Figure 1. Participants' unmet needs by clinic site





Supplementary Table S1: Older adults' unmet needs by medical condition

Disease or conditions (multiple options possible) **Total n=** N=546 (100%)	Had any health-related unmet needs* N=142	Had no health-related unmet needs* N=404	Bivariate P-value**	Had any unmet need N=340	Had no unmet need N=206	Bivariate P-value**
Hypertension, n (%)*			0.68			0.51
Yes	98 (26.7)	269 (73.3)		232 (63.2)	135 (36.8)	
No	44 (24.6)	135 (75.4)		105 (59.7)	71 (40.3)	
Diabetes, n (%)*			0.01			0.15
Yes	55 (33.5)	109 (66.5)		110 (67.1)	54 (32.9)	
No	87 (22.8)	295 (77.2)		230 (60.2)	152 (39.8)	
Heart Failure, n (%)*			0.08			0.22
Yes	34 (33.0)	69 (67.0)		70 (68.0)	33 (32.0)	
No	108 (24.4)	335 (75.6)		270 (60.9)	173 (39.1)	
Coronary Artery Disease, n (%)*			0.61			0.49
Yes	28 (28.3)	71 (71.7)		65 (65.7)	34 (34.3)	
No	114 (25.5)	333 (74.5)		275 (61.5)	172 (38.5)	
Valvular disease, n (%)*			0.46			0.61
Yes	8 (20.0)	32 (80.0)		23 (57.5)	17 (42.5)	
No	134 (26.5)	372 (73.5)		317 (62.6)	189 (37.4)	
COPD, n (%)*			<0.001			0.003
Yes	48 (39.3)	74 (60.7)		90 (75.0)	30 (25.0)	
No	94 (22.2)	330 (77.8)		250 (59.0)	174 (41.0)	
Asthma, n (%)*			0.76			1.00
Yes	17 (27.9)	44 (72.1)		38 (62.3)	23 (37.7)	
No	125 (25.8)	360 (74.2)		302 (62.3)	183 (37.7)	
Other Lung Disease, n (%)*			0.84			1.00
Yes	10 (27.8)	26 (72.2)		23 (63.9)	13 (36.1)	
No	132 (25.9)	378 (74.1)		317 (62.2)	193 (37.8)	
Cirrhosis, n (%)*			1.00			0.35
Yes	5 (25.0)	15 (75.0)		15 (75.0)	5 (25.0)	
No	137 (26.1)	388 (73.9)		324 (61.7)	201 (38.3)	
HIV, n (%)*			0.66			1.00
Yes	16 (23.5)	52 (76.5)		42 (61.8)	26 (38.2)	
No	126 (26.4)	352 (73.6)		298 (62.3)	180 (37.7)	
Dementia, n (%)*			0.90			0.49
Yes	24 (25.0)	72 (75.0)		63 (65.6)	33 (34.4)	
No	118 (26.2)	332 (73.8)		277 (61.6)	173 (38.4)	
Depression, n (%)*			1.00			1.00
Yes	43 (25.7)	124 (74.3)		104 (62.3)	63 (37.7)	
No	99 (26.1)	280 (73.9)		236 (62.3)	143 (37.7)	
History of Falls, n (%)*			1.00			0.28
Yes	29 (25.9)	83 (74.1)		75 (67.0)	37 (33.0)	
No	113 (26)	321 (74)		265 (61.1)	169 (38.9)	
Urinary Incontinence, n (%)*			0.38			0.36
Yes	22 (22.2)	77 (77.8)		66 (66.7)	33 (33.3)	
No	120 (26.8)	327 (73.2)		274 (61.3)	173 (38.7)	

*Unmet health-related needs included medication refills, medical supplies and food.

**Chi-square Test of Independence results or Fisher's Test, significance level set at 0.05

***Row percentages

Supplementary Table S2: Older adults' health care utilization before and after outreach call by clinic site

		Clinic sites				
	Total	**Home-Based Primary Care** N=136 (24.9%)*	**Academic Geriatrics Primary Care** N=199 (36.5%)*	**Primary Care for Adults Living with HIV** N=68 (12.5%)*	**Safety Net Primary Care for Adults** N=143 (26.2%)*	**Differences between sites (P-value)****
Acute care 3 months before outreach call						
One or more ER visit, n (%)	56 (10.3)	30 (22.1)	10 (5.0)	6 (8.8)	10 (7.0)	<0.001
One or more hospitalization, n (%)	58 (10.6)	23 (16.9)	16 (8.0)	6 (8.8)	13 (9.1)	0.05
One or more urgent care visit, n (%)	15 (2.8)	0 (0.0)	1 (0.5)	9 (13.2)	5 (3.5)	<0.001
Any Acute Care Visit, n (%)	92 (16.9)	31 (22.8)	25 (12.6)	15 (22.1)	21 (14.7)	0.05
Acute care 3 months after outreach call						
One or more ER visit, n (%)	42 (7.7)	12 (8.8)	14 (7.0)	9 (13.2)	7 (4.9)	0.18
One or more hospitalization, n (%)	58 (10.6)	11 (8.1)	24 (12.1)	10 (14.7)	13 (9.1)	0.41
One or more urgent care visit, n (%)	15 (2.8)	0 (0.0)	2 (1.0)	10 (14.7)	3 (2.1)	<0.001
Any Acute Care Visit, n (%)	89 (16.3)	14 (10.3)	36 (18.1)	22 (32.4)	17 (11.9)	<0.001
Died within 3 months of outreach call, n (%)	3 (0.6)	1 (0.7)	1 (0.5)	1 (1.5)	0 (0.0)	0.59

Calls were made between 3/26/2021 and 10/13/2021.
*Column percentage per clinic site
**Chi-square Test of Independence results

Supplementary Table S3. ICD-10 codes used by medical condition

HIV	B20.x--B22.x, B24.x
Hypertension	H35.03x, I10.x--I16.x, I97.3, O10.x--O16.x. Does not include R03.0.
Diabetes	E08.x--E11.x, E13.x
Heart Failure	I11.0, I13.0, I13.2, I25.5, I42.0, I42.5-I42.9, I43.x, I50.x, P29.0
Coronary Artery Disease	I20.x--I25.x
Valvular Disease	I05.x--I09.x, I34.x--I37.x
COPD	J40.x--J44.x
Asthma	J45.x
Other Lung Disease	I27.0, I27.2, I27.8, I27.9, J47.x, J60.x--J70.x, J84.x
Cirrhosis	K70.3, K71.7, K72.1, K74.3x--K74.6x, K76.6, K76.7, K76.81
Dementia	A81.x, F01.x--F03.x, F10.27, F10.97, F13.27, F13.97, F18.17, F18.27, F18.97, F19.17, F19.27, F19.97, G30.x--G31.x. Does not include R41.81 or G31.84
Depression	F06.31, F32.x--F33.x, F53.0
History of Falls	R29.6, W00.x--W19.x, Z91.81
Urinary Incontinence	N39.3, N39.4x, R32, R39.81

Unmet health-related needs of community-dwelling older adults during COVID-19 lockdown in a diverse urban cohort

Laura Perry, MD[1], Charlotte Scheerens, PhD, [1,2,5], Meredith Greene, MD[1], Ying Shi, PhD[1], Zoe Onion, BA[1], Evamae Bayudan, BS[1], Rachel J Stern, MD[6] Joni Gilissen[3,4], Anna H. Chodos MD, MPH[1,3]

[1]Department of Medicine, Division of Geriatrics, University of California San Francisco, San Francisco, California, United States

[2]Department of Public Health and Primary care, Universiteit Gent, Gent, Belgium

[3]Atlantic Fellowship for Equity in Brain Health, Global Brain Health Institute, San Francisco, California, United States

[4]End-of-Life Care Research Group, Dept Family Medicine & Chronic Care, Vrije Universiteit Brussel (VUB), Brussels, Belgium

[5]Institute for Lung Health, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, United States

[6] Ambulatory Care, Ventura County Healthcare Agency

Corresponding Author: Laura Perry, MD, 4150 Clement Street, Building 208, San Francisco, CA 94121, 415-221-4810, ext 24229, laura.perry@ucsf.edu, @LPerrytheGeriMD

Alternate Corresponding Author: Anna H. Chodos, anna.chodos@ucsf.edu

Abstract word count: 298

Main text word count: 3158

Funding sources and related paper presentations: COVID-19 Solidarity Grant, Atlantic Institute and Rhodes Trust. Oral presentation at the American Geriatrics Society, Annual Meeting, May 13, 2021 as “Clinical Outreach to Older Adults in the Community During COVID-19: a Description of Unmet Health-Related Needs.”

Running head: Unmet Health Related Needs During COVID

We certify that this work is novel or confirmatory of recent novel clinical research.

The potential impact of this research on clinical care or health policy includes the following: The disruption of services in the context of a public health emergency creates substantial health-related needs among older adults in the community, with non-English speakers disproportionately affected; this should be a core consideration of the on-going pandemic and for future crisis responses.

Keywords: *COVID-19, shelter-in-place, unmet health needs, geriatrics, equity*

ABSTRACT:

BACKGROUND: Shelter-in-place orders during the COVID-19 pandemic created unmet health-related and access-related needs among older adults. We sought to understand the prevalence of these needs among community dwelling older adults.

METHODS: We performed a retrospective chart review of pandemic-related outreach calls to older adults between March and July 2020 at four urban, primary care clinics: a home-based practice, a safety-net adult medicine clinic, an academic geriatrics practice, and a safety-net clinic for adults living with HIV. Participants included those 60 or older at three sites, and those 65 or older with a chronic health condition at the fourth. We describe unmet health-related needs (the need for medication refills, medical supplies, or food) and access-related needs (ability to perform a telehealth visit, need for a call back from the primary care provider). We performed bivariate and multivariate analyses to examine the association between unmet needs and demographics, medical conditions, and health care utilization.

RESULTS: Sixty-two percent of people had at least one unmet need. Twenty-six percent had at least one unmet health-related need; 14.0% needed medication refills, 12.5% needed medical supplies, and 3.0% had food insecurity. Among access-related needs, 33% were not ready for video visits, and 36.4% asked for a return call from their provider. Prevalence of any unmet health-related need was the highest among Asian vs. white (36.4% vs. 19.1%) and in the highest vs. lowest poverty zip codes (30.8% vs. 18.2%). Those with diabetes and COPD had higher unmet health-related needs than those without, and there was no change in health care utilization.

CONCLUSIONS: During COVID, we found that disruptions in access to services created unmet needs among older adults, in particularly for those who self-identified as Asian. We must foreground the needs of this older population group in the response to future public health crises.

KEY POINTS

- One quarter of community-dwelling older adults had an unmet health-related need (needing medicine, medical supplies, or food) when health care and social services were limited in the context of the pandemic.
- Asian older adults and those living in neighborhoods with higher poverty had the highest rates of unmet needs in this urban study.

WHY DOES THIS PAPER MATTER?

The results of this study demonstrate the real-world impacts of shelter-in-place orders on vulnerable older adults living in the community. It provides evidence that specific populations had greater needs, specifically those who were non-English speakers, those who lived in zip codes with higher poverty levels, and those with both Medicare and Medicaid. We intend that readers of this paper can cite this data when having discussions with local governments, particularly public health and social service agencies, about the need to create contingency plans to meet the needs of older adults should future epidemics or other crises necessitate shelter-in-place orders.

INTRODUCTION

The COVID-19 pandemic has profoundly impacted older adults, with severe illness and death being far more common in older persons than younger ones.[1] In the spring of 2020, many U.S. municipalities enacted shelter-in-place orders to limit its spread. The shutdown of medical and social services that older adults rely on created a second set of challenges in the day-to-day lives of older adults as unmet health-related and social needs soared.[2–6] Medical practices stepped up to fill an unmet need and perform emergency triage of their patients' needs during the initial shutdown.

Health care providers offered telehealth and other remote communication solutions to maintain access for their people. However, technology has not been adapted to older adults, who as a result use technology less than younger adults at baseline and are more likely to have sensory and cognitive impairments that decrease their ability to use telehealth resources as currently designed.[7] Many were unable to navigate the push to telehealth and remote technology.[8,9]

Shortly after shelter-in-place orders were enacted, several primary care practices in our area identified that many older patients were lacking in basic needs, and performed outreach calls to identify these needs and connect patients to resources when needed. Patients were specifically asked about missing medication refills, medical supplies, groceries, and caregivers, as these were needs that were identified as frequently being disrupted, potentially life-threatening, and areas in which providers or social services could likely intervene. During this time, practices prepared to change how care would be delivered, from almost exclusively in-person to primarily via phone or telehealth. In these same outreach calls, patients and

families were asked about telehealth readiness and desire for a follow-up call from the provider, to triage when and how high-risk patients would be seen.

While other studies have focused on social isolation,[10] well-being,[11-12] and falls,[13] few have described how lockdowns impacted the day-to-day care needs of vulnerable older adults. One study evaluated needs for assistance with activities of daily living and revealed gaps between needs for assistance and receipt of that assistance that widened during the COVID-19 pandemic in the United States.[14] To better describe this gap, we performed a retrospective chart review of the outreach calls performed by these primary care clinics. In this paper, we describe the prevalence of unmet health-related needs during shelter-in-place among a cohort of older adult patients in primary care and their relationship to demographic factors, health conditions, and health care utilization.

METHODS

Setting

Shelter-in-place orders took effect on March 16, 2020. Due to the disruption in services, four adult or geriatrics-focused primary care practices affiliated with the University of California at San Francisco and the San Francisco Health Network performed outreach phone calls using volunteers and staff after the implementation of shelter-in-place orders. The four clinics included were: 1) an academic home-based primary care practice, 2) an academic geriatric outpatient clinic, 3) a safety net adult medicine clinic, and 4) a safety net clinic for adults living with HIV. Clinical leaders of each practice guided callers how to respond to identified needs, e.g. creating a medication refill request if needed; clinical leaders were also available to assist callers if questions arose.

Participants

The cohort includes those patients that were actively empaneled at their respective clinics and successfully received an outreach call. At the home-based primary care practice and academic geriatrics practice, all community-dwelling people over age 60 were called. At the adult medicine clinic, which had a larger patient population and slightly less staff capacity to make calls, people 65 and older without a recent visit (within March 2020) and with a serious condition (chronic obstructive pulmonary disease, diabetes, or congestive heart failure) were called. In the clinic for those living with HIV clinic, they included all adults over age 60. All clinics called until they reached their patients, except for the adult medicine clinic which called a maximum of two times. We excluded patients who were not reached.

Measurements

Calls were made between March 26, 2020 and July 28, 2020 and documented in the medical record. We abstracted outreach call responses from the electronic medical record retrospectively. Because the scripts and protocols varied slightly between sites, we report data from questions that were shared between sites.

First, patients were asked about health-related needs: if they had 1) adequate medication refills, 2) adequate medical supplies for their needs (e.g. wound care dressings, oxygen, etc.), and 3) access to food. Second, two additional access-related needs were assessed: 1) their ability to perform future telehealth visits with their clinicians, and 2) whether they wanted a follow-up call from their primary care provider. A question about caregiver availability was included in the initial outreach phone call, but due to variability in how the question was asked between sites, that data was unable to be abstracted from the EMR and thus is not reported. Additionally, the adult safety net clinic did not ask about telehealth visits, as this clinic did not implement telehealth protocols at the time.

Data collection

Via chart review of electronic medical records, we abstracted data on factors that might affect unmet needs including demographics (age calculated from date of birth, self-identified gender, self-identified race and ethnicity, ZIP code, insurance type, and primary language); we used AskCHIS to obtain zip code-level data on percentage of adults living under the federal poverty level, and stratified zip codes into four quartiles based into those with higher and lower local rates of poverty (<7.5% of adults in the zip code living under the federal poverty level, 7.5-10%, 10.1-12.5%, and >12.5%).[15] We abstracted information about medical conditions that we believed might affect the prevalence of unmet needs or determine the severity of its impact as present or not (hypertension, HIV, diabetes, heart failure, coronary artery

disease, valvular disease, COPD, asthma, other lung diseases, cirrhosis, dementia, depression, history of falls, and urinary incontinence) using the ICD-10 codes listed in Supplementary Table S3; acute care use in the three months before and after the outreach phone calls (defined as urgent care visits, emergency room visits, and hospitalizations); and deaths three months after the outreach phone call.

We abstracted responses to the outreach questions about health-related needs for medication refills (yes/no), for medication supplies (yes/no), or for food (yes/no) at the time of the call. We also abstracted responses to the questions about access-related needs for telehealth visits (there was a need if the patient was unable to switch from scheduled in-person visits to telehealth visits, for any reason), and wanted a follow-up phone call from their provider (yes/no).

Statistical analysis

Descriptive statistics were used to characterize the sample and assess frequencies of unmet needs. Bivariate analysis was performed to report on differences between clinic sites with regard to patient demographic and medical conditions. Bivariate analyses were also done to examine association between demographic characteristics and unmet needs. We set statistical significance at $p<0.05$ (two-sided). Multivariate analysis was performed in mixed-effects models, adjusting for age, gender, clinical site and insurance status. Analyses were performed using SAS 9.4 (SAS Institute, Inc.). All study procedures were approved by the UCSF IRB.

RESULTS

Sample characteristics

Among the four clinic sites, 546 people received an outreach call and were reached successfully, of which 136 (24.9%) were from home-based primary care, 199 (36.5%) from geriatric primary care, 143 (26.2%) from the adult medicine clinic in the

safety net, and 68 (12.5%) from the clinic for adults with HIV. Of all sites, only the adult medicine clinic in the safety net did not reach all their patients; of 702 patients who met criteria for outreach, 326 (46.4%) were reached at all and only 143 (20.4%) completed the full outreach call.

Demographic characteristics overall and across clinic sites are shown in Table 1. A third (32.1%) were between 71 and 80 years old, over half (56.7%) were male, and three quarters (75.8%) were English-speaking. Regarding self-identified race, 46.9% were White, 27.7% were Asian, and 12.3% were Black. Nearly half (46.9%) were dual eligible, insured by both Medicare and Medical (California's Medicaid program). The most prevalent conditions were hypertension (67.2%), lung disease (35.9%), any heart disease (31.3%), depression (30.6%), and diabetes (30.0%).

Unmet needs

During shelter-in-place, 142 (26.0%) people called had at least one unmet health-related need, of which 76 (14.0%) needed medication refills, 66 (12.5%) needed medical supplies, and 16 (3.0%) needed access to food. Of all people who were asked (n=403), 128 (32.9%) were not ready for telehealth visits, and 192 (36.4%) asked for a return call from their primary care provider. In total, 340 (62.3%) people had at least one unmet need. People who received their care from the safety net adult medicine clinic had higher rates of unmet needs than other sites; 47.6% had one or more health-related unmet need. All findings are shown in Figure 1.

Unmet needs by demographics

In the bivariate analyses shown in Table 2, there were differences in the prevalence of unmet health-related needs between age groups, insurance types, self-identified

race, primary language, and poverty at the level of zip code (at statistical significance of $p<0.05$), seen across all clinic sites.

Unmet health-related needs were the highest among self-identified Asian people (36.4%) compared with other racial groups, except for American Indian/Alaska Native (50.0%) for which there were only 2 people in the cohort. Among those identifying as Asian, there was a different prevalence of unmet health-related needs among speakers by Asian languages: Cantonese (57.5%), Vietnamese (50.0%, n=4), Tagalog (44.4%) and Mandarin (36.8%). Among those who identified as Asian and their preferred language was an Asian language, 46.9% (38/81) reported an unmet health-related need, versus 24.3% (17/70) of those who identified as Asian but who preferred English (data not shown in tables).

Among different age groups, the youngest, 61-70, had the highest unmet health-related needs (37.8%). For health-related and access-related needs combined, those between 61-70 years old and 100+ had more unmet needs (71.9% and 75.0%, n=3 for 100+) than those between 71-80 (61.1%), 81-90 (53.4%) and 91-100 years old (64.0%) ($p<0.05$, data not shown).

Among people with both Medicare and MediCal, 33.6% had unmet health-related needs, compared with 12.6% of people with Medicare and private insurance. Those with private insurance only and people without insurance also had high rates of unmet health-related needs (44.4% and 40.0%, respectively), but there were only 9 and 5 people in these cohorts, respectively.

There were also differences by quartile of zip code-level poverty, with more people in each group of increasing quartile of zip-code poverty having more unmet health-related needs: 30.8% in those living in zip codes with the highest rates of poverty vs. 18.2% in those living in zip codes with the lowest rates of poverty.

252

253 **Unmet needs by medical conditions**

254 Of the medical conditions assessed, only for those with the diagnoses of diabetes
255 and COPD was there an association of more unmet health-related needs for people
256 with the condition compared with people without it. Of those with diabetes, 33.5%
257 had an unmet health-related need compared to 22.8% of those without diabetes;
258 39.3% of those with COPD had unmet health-related needs compared to 22.2% of
259 those who did not have COPD (comparison data shown in Supplementary Table S1).

260

261 **Unmet needs and health care utilization**

262 There was a modest decrease in the number of people with an ER visit between the
263 three months before the outreach call (10.3%) and the three months after the
264 outreach call (7.7%), as shown in Supplementary Table S2. Of note, this decrease
265 was most pronounced among the people receiving care from the home-based
266 primary care practice (22.1% pre vs 8.8% post). Rates of hospitalizations and urgent
267 care visits stayed the same. Three people (0.6%) died within three months of the
268 outreach call. There were no differences seen in the rates of acute care utilization
269 based on the presence or absence of unmet needs (data not shown).

270

271 **Multivariate analysis**

272 After adjustment for age, gender, clinical site and insurance status, primary
273 Cantonese speakers had an odds ratio of 4.37 (95% CI 2.01-9.51) of having an
274 unmet need, compared with primary English speakers. This was the only statistically
275 significant association that persisted under multivariate analysis.

276

DISCUSSION

The ripple effects of the COVID pandemic have been wide-reaching throughout all aspects of older adults' lives. San Francisco was relatively spared during the initial surge of COVID pandemic compared with most other comparable-sized cities in the United States; cases and deaths remained overall quite low.[16,17] However, our study presents data on a second, shadow pandemic of unmet needs in the setting of strict stay-at-home orders. In an urban setting with a diverse cohort of patients, about two thirds (62.3%) reported any unmet need. These unmet needs were most pronounced among older adults who were already underserved by virtue of their demographics: those living in zip codes with higher rates of poverty, those with both Medicare and MediCal, and those who received care in the safety net. Additionally, Asian older adults, particularly those whose primary language was Cantonese, reported higher rates of unmet health-related needs than their white counterparts. Finally, people with COPD or diabetes reported higher rates of unmet needs, which we attribute to the unique needs of these conditions that require additional equipment and medications; of note, this was not significant in multivariate analysis.

These unmet needs were a predictable consequence of rapid disruption of regular services for a vulnerable population, and reflect a lack of prior adequate planning to address the fragility of these services.[8,18] Clapp and colleagues evaluated the shadow pandemic of unmet social needs in New York City residents but did not include needs for medications or medical supplies,[19] which older adults are more likely to need than younger ones. San Francisco is often characterized as a city with a robust safety net, but our data shows that older adults had critical needs that were not met by this safety net during shelter-in-place.

While younger, more robust adults are often able to find alternate solutions during times of crisis, older adults who rely on community programs and social services to meet their basic needs are often more vulnerable during times of communal crisis.[8,18] Going forward, pandemic preparedness could better anticipate the needs of vulnerable older adults when addressing the disruption of usual services to mitigate the impact of this crisis on our communities, cities, and counties.

While telehealth increased in primary health care throughout the county, our data suggests limitations of this solution, as more than one-third of older patients who were called indicated they could not perform a telehealth visit. This is consistent with research showing similar unreadiness of older adults for telehealth visits and research on the gender and racial disparities in access to telehealth among older adults in the US. [7,21]

We did not find that unmet needs were associated with increased health care utilization. We hope that our outreach calls and interventions mitigated some of the unmet needs and thus prevented an increase in utilization. It also could be due to care avoidance due to the severe disruption in services, public health messaging to stay away if possible, and patients and caregivers reporting a fear of going to the hospital due to the perceived risk of contracting COVID, as occurred in other parts of California.[22]

Strengths and limitations

This study represents electronic medical record data that was obtained during a time of crisis for clinical purposes. There are limitations of this type of data collection. First, we do not have data on the prevalence of unmet needs prior to shelter-in-place, and thus cannot determine what proportion of these unmet needs were due to the crisis of the moment. Second, not all people at the adult medicine clinic were reached by phone. Thus, our data may not fully represent unmet needs; it is possible those most at risk may not have been reached by phone. Third, our study was limited to a single city and to academic-affiliated clinics. San Francisco had earlier and some of the more stringent lockdown restrictions in the country during the time of this study, and thus results may have been different in other parts of the country. However, strengths include the diversity of our patient population, which mirrors the diversity of the city of San Francisco. Asian Americans have often been overlooked in studies describing disparities during the COVID-19 pandemic; and this study contributes to the literature demonstrating that disparities do exist.[23,24] Another strength is that our data are unique and show health- and access-related unmet needs in an older adult population during lockdown, findings which have not been described elsewhere.

Finally, a significant strength was the outreach calls themselves, which represented a tremendous effort by the practices involved to quickly adapt to meet the needs of their vulnerable patients in a time of crisis. We do not know how our patients would have fared if not for these efforts; we hope that this data demonstrates the glaring need that our practices stepped up to meet. We also hope that this data will be considered by decision makers who shape municipalities' pandemic preparedness

plans, as older adults' needs are complex and require more thorough consideration than previously given.

CONCLUSION

The four primary care practices in this paper acted as first and essential responders to vulnerable older adults in a time of need, stepping outside of the usual scope of practice. In doing so, they identified profound needs that should be a call to action for public health and community safety entities. Older adults commonly experience functional, sensory and cognitive disabilities that impact the ability to connect to resources during times of crisis; this study demonstrates the vulnerability of older adults as a group, and need for additional attention and planning in order to prevent similar crises. COVID-19 has unmasked many areas of vulnerability in the social safety net, and proven that prior methods of crisis preparedness have been inadequate. Future crises will come, and older adults need consideration as much as any other vulnerable group. We call on community leaders to build proactive crisis response plans that prioritize older adults for more targeted assistance.

Conflict of Interest:

All authors have no potential conflicts of interest to declare.

Author Contributions:

Authors LP, MG, CS, RC, JG, AC had a role in conceptualizing and designing the study. Authors LP, CS and YS conducted all data analysis. Author ZO created the data collection database. Authors EB and ZO performed data collection. Authors LP and EB performed data quality assurance. All authors contributed to the interpretation of the data and preparation of the manuscript.

Acknowledgements

SPONSOR'S ROLE

Grant funding came from the COVID-19 Solidarity Grant, provided by the Atlantic Institute and Rhodes Trust.

THANK YOUS

The authors would like to thank the clinics who enthusiastically collaborated with us during this study, Carla Perissinotto, MD, MPH, Courtney Gordon, NP; Pei Chen, MD; Rebecca Sudore MD, Belinda Tang, Emily Reyes, Clarissa Ferguson, Linda Phung, and Janelle Silvis for their contributions to this work.

References

1. Rapp JL, Lieberman-Cribbin W, Tuminello S, Taioli E. Male Sex, Severe Obesity, Older Age, and Chronic Kidney Disease Are Associated With COVID-19 Severity and Mortality in New York City. *Chest*. 2021;159(1):112-115. doi:10.1016/j.chest.2020.08.2065

2. Benfer EA, Wiley LF. Health Justice Strategies To Combat COVID-19: Protecting Vulnerable Communities During A Pandemic. Health Affairs Blog. doi:10.1377/hblog20200319.757883

3. Abrams EM, Szefler SJ. COVID-19 and the impact of social determinants of health. *Lancet Respir Med*. 2020;8(7):659-661. doi:10.1016/S2213-2600(20)30234-4

4. Graham J. For Seniors, COVID-19 Sets Off A Pandemic Of Despair. *Kaiser Health News*. 1. https://khn.org/news/for-seniors-covid-19-sets-off-a-pandemic-of-despair/. Published May 28, 2020. Accessed October 13, 2021.

5. Krendl AC, Perry BL. The Impact of Sheltering in Place During the COVID-19 Pandemic on Older Adults' Social and Mental Well-Being. Isaacowitz DM, ed. *J Gerontol Ser B*. 2021;76(2):e53-e58. doi:10.1093/geronb/gbaa110

6. Steinman MA, Perry L, Perissinotto CM. Meeting the Care Needs of Older Adults Isolated at Home During the COVID-19 Pandemic. *JAMA Intern Med*. 2020;180(6):819. doi:10.1001/jamainternmed.2020.1661

7. Lam K, Lu AD, Shi Y, Covinsky KE. Assessing Telemedicine Unreadiness Among Older Adults in the United States During the COVID-19 Pandemic. *JAMA Intern Med*. 2020;180(10):1389. doi:10.1001/jamainternmed.2020.2671

8. *Closing the Gaps: Advancing Disaster Preparedness, Response and Recovery for Older Adults*. American Red Cross; 2020. Accessed October 13, 2021. https://www.redcross.org/content/dam/redcross/training-services/scientific-advisory-council/253901-03%20BRCR-Older%20Adults%20Whitepaper%20FINAL%201.23.2020.pdf

9. Brewster AL, Wilson TL, Kunkel SR, Markwood S, Shah TB. To Support Older Adults Amidst The COVID-19 Pandemic, Look to Area Agencies On Aging. Health Affairs Blog. Published April 8, 2020. https://www.healthaffairs.org/do/10.1377/hblog20200408.928642/full/

10. Ankuda CK, Kotwal A, Reckrey J, Harrison KL, Ornstein KA. The Experience of Homebound Older Adults During the COVID-19 Pandemic. *J Gen Intern Med*. 2022; Epub ahead of print. doi: 10.1007/s11606-021-07361-9.

11. Holaday LW, Oladele CR, Miller SM, Dueñas MI, Roy B, Ross JS. Loneliness, sadness, and feelings of social disconnection in older adults during the COVID-19 pandemic. *J Am Geriatr Soc.* 2022;70(2):329-340. doi: 10.1111/jgs.17599.

12. Winship JM, Gendron T, Waters L, Chung J, Battle K, Cisewski M, Gregory M, Sargent L, Zanjani F, Slattum P, Mackiewicz M, Diallo A, Ford G, Falls K, Price ET, Parsons PL; VCU iCubed Health and Wellness in Aging Transdisciplinary

Core8. COVID in Context: The Lived Experience of Richmond's Low-Income Older Adults. *Gerontol Geriatr Med.* 2022;8:23337214221079208. doi: 10.1177/23337214221079208.

13. McIntyre CC, Prichett L, McNabney MK. Impact of COVID-19 Stay-At-Home Restrictions on Falls in One Community of High-Risk Older Adults. *J Appl Gerontol*. 2022; Epub ahead of print. doi: 10.1177/07334648211073607.

14. Chen S, Jones LA, Jiang S, Jin H, Dong D, Chen X, Wang D, Zhang Y, Xiang L, Zhu A, Cardinal RN. Difficulty and help with activities of daily living among older adults living alone during the COVID-19 pandemic: a multi-country population-based study. *BMC Geriatr*. 2022;22(1):181. doi: 10.1186/s12877-022-02799-w.

15. *AskCHIS Neighborhood Edition. Living in Poverty (<100%FPL) (18+) Comparing Zip Codes*. 9. UCLA Center for Health Policy Research, Los Angeles, CA Accessed February 19, 2021. Available at: https://askchisne.ucla.edu

16. *American Cities and Covid-19*. City Mayors Research Accessed August 12, 2021. http://www.citymayors.com/coronavirus/us-cities-covid-19-cases-2.html

17. Hwang K. How San Francisco's coronavirus case rate compares to other U.S. cities right now. *San Francisco Chronicle*. https://www.sfchronicle.com/bayarea/article/How-San-Francisco-s-coronavirus-case-rate-15832776.php. Published December 28, 2020.

18. Aldrich N. CDC's Disaster Planning Goal: Protect Vulnerable Older Adults. Accessed October 18, 2021. https://www.cdc.gov/aging/pdf/disaster_planning_goal.pdf

19. Clapp J, Calvo-Friedman A, Cameron S, Kramer N, Kumar SL, Foote E, Lupi J, Osuntuyi O, Chokshi DA. The COVID-19 Shadow Pandemic: Meeting Social Needs For A City In Lockdown. *Health Aff (Millwood)*. 2020;39(9):1592-1596. doi: 10.1377/hlthaff.2020.00928.

20. Corlette S, Berenson R, Wengle E, Lucia K, Thomas T. *Impact of the COVID-19 Pandemic on Primary Care Practices*. The Urban Institute, Robert Wood Johnson Foundation; 2021. Accessed October 18, 2021. https://www.pcpcc.org/2021/02/11/impact-covid-19-pandemic-primary-care-practices

21. Ryskina KL, Shultz K, Zhou Y, Lautenbach G, Brown RT. Older adults' access to primary care: Gender, racial, and ethnic disparities in telemedicine. *J Am Geriatr Soc*. 2021;69(10):2732-2740. doi:10.1111/jgs.17354

22. Wong LE, Hawkins JE, Langness S, Murrell KL, Sammann A. Where Are All the Patients? Addressing Covid-19 Fear to Encourage Sick Patients to Seek Emergency Care. *NEJM Catal*. Published online May 14, 2020. doi:10.1056/CAT.20.0193

23. Yee A. COVID's Outsize Impact on Asian Americans Is Being Ignored. *Sci Am*. Published online May 6, 2021.

24. Eberly LA, Kallan MJ, Julien HM, Haynes N, Khatana SAM, Nathan AS, Snider C, Chokshi NP, Eneanya ND, Takvorian SU, Anastos-Wallen R, Chaiyachati K, Ambrose M, O'Quinn R, Seigerman M, Goldberg LR, Leri D, Choi K, Gitelman Y, Kolansky DM, Cappola TP, Ferrari VA, Hanson CW, Deleener ME, Adusumalli S. Patient Characteristics Associated With Telemedicine Access for Primary and Specialty Ambulatory Care During the COVID-19 Pandemic. *JAMA Netw Open.* 2020 Dec 1;3(12):e2031640. doi: 10.1001/jamanetworkopen.2020.31640.

Supplemental material includes three tables:

Table S1: Participants' unmet needs stratified by presence or absence of medical conditions

Table S2: Participants' health care utilization before and after outreach call by clinic site

Table S3. ICD-10 codes used by medical condition

Table 1. Participant characteristics

	Total (N=546)
Age, n (%)	
61-70 years old	135 (24.7)
71-80 years old	175 (32.1)
81-90 years old	146 (26.7)
91-100 years old	86 (15.8)
100+ years old	4 (0.7)
Race, n (%)	
American Indian or Alaska native	2 (0.4)
Asian	151 (27.7)
Black	67 (12.3)
White	256 (46.9)
Native Hawaiian /Pacific Islander	5 (0.9)
Other	62 (11.4)
Declined to answer	1 (0.2)
Ethnicity, n (%)	
Non-Hispanic	467 (87.1)
Hispanic	69 (12.9)
Primary language, n (%)	
English	413 (75.8)
Spanish	42 (7.7)
Mandarin	19 (3.5)
Cantonese	40 (7.3)
Vietnamese	4 (0.7)
Tagalog	9 (1.7)
Russian	3 (0.6)
Other	15 (2.8)
Gender, n (%)	
Female	233 (42.9)
Male	308 (56.7)
Transgender	2 (0.4)
Insurance status, n (%)	
Medicare only	82 (15.0)
Medicare and MediCal	256 (46.9)
Medicare and private	175 (32.1)
MediCal only	18 (3.3)
Private only	9 (1.7)
Uninsured	5 (0.9)
Adults (%) in poverty within zip code, n (%)**	
<7.5%	143 (26.2)
7.5-10%	183 (33.5)
10.1-12.5%	100 (18.3)
>12.5%	120 (21.9)
Medical conditions, n (%)	
Hypertension	367 (67.2)
Diabetes	164 (30.0)
Heart Failure	103 (18.9)
Coronary Artery Disease	99 (18.1)
Valvular Disease	40 (7.3)
COPD	122 (22.3)
Asthma	61 (11.2)
Another Lung Disease	36 (6.6)
Cirrhosis	20 (3.7)
HIV	68 (12.5)
Dementia	96 (17.6)
Depression	167 (30.6)
History of Falls	112 (20.5)
Urinary Incontinence	99 (18.1)

**Divided into four roughly equal quartiles by the authors.

Table 2. Association between unmet health-related needs and demographics

Demographics Total N=546 (100%)	**Had any health-related unmet need*** N=142	**Had no health-related unmet needs*** N=404	**P-value****
Age, n (%)***			<0.001
61-70 years old	51 (37.8)	84 (62.2)	
71-80 years old	48 (27.4)	127 (72.6)	
81-90 years old	19 (13.0)	127 (87.0)	
91-100 years old	23 (26.7)	63 (73.3)	
100+ years old	1 (25.0)	3 (75.0)	
Race, n (%)***			0.002
American Indian or Alaska native	1 (50.0)	1 (50.0)	
Asian	55 (36.4)	96 (63.6)	
Black	16 (23.9)	51 (76.1)	
White	49 (19.1)	208 (80.9)	
Native Hawaiian /Pacific Islander	0 (0.0)	5 (100.0)	
Other	20 (31.3)	44 (68.8)	
Ethnicity, n (%)***			0.77
Hispanic	19 (27.5)	50 (72.5)	
Non-Hispanic	119 (25.5)	348 (74.5)	
Primary language, n (%)***			<0.001
English	87 (21.1)	326 (78.9)	
Spanish	12 (28.6)	30 (71.4)	
Mandarin	7 (36.8)	12 (63.2)	
Cantonese	23 (57.5)	17 (42.5)	
Vietnamese	2 (50.0)	2 (50.0)	
Tagalog	4 (44.4)	5 (55.6)	
Russian	1 (33.3)	2 (66.7)	
Other	5 (33.3)	10 (66.7)	
Gender, n (%)***			0.96
Female	62 (26.6)	171 (73.4)	
Male	80 (26.0)	228 (74.0)	
Transgender	0 (0.0)	2 (100.0)	
Insurance status, n (%)***			<0.001
Medicare only	22 (26.8)	60 (73.2)	
Medicare and MediCal	86 (33.6)	170 (66.4)	
Medicare and private	22 (12.6)	153 (87.4)	
MediCal only	6 (33.3)	12 (66.7)	
Private only	4 (44.4)	5 (55.6)	
Uninsured	2 (40.0)	3 (60.0)	
Percent of adults in zip code living in poverty, n (%)***			0.04
<7.5%	26 (18.2)	117 (81.8)	
7.5-10%	46 (25.1)	137 (74.9)	
10.1-12.5%	33 (33.0)	67 (67.0)	
>12.5%	37 (30.8)	83 (69.2)	

*Unmet health-related needs included medication refills, medical supplies and food.
**Chi-square test of Independence results or Fisher's Test, significance level set at 0.05; Data on gender, race and ethnicity were all self-reported, collected at the time of registration with the clinical practice. These were existing categories in the EMR. P-values represent difference between subgroups by demographic.
***Percentages listed are row percentages.

Figure 1. Participants' unmet needs by clinic site

Two bar graphs are given. From left to right on first bar graph:

Needs medication refills

Needs medical supplies

Food insecurity

Any unmet need

From left to right on second bar graph:

Not ready for telehealth

Would like another call

Any (≥1) above-mentioned need identified