



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

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Key Words:	COVID-19, shelter-in-place, unmet health needs, geriatrics, equity

1 **Unmet health-related needs of community-dwelling older adults during COVID-**
2 **19 lockdown in a diverse urban cohort**

3

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31 Running head: Unmet Health Related Needs During COVID

32

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

34

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

40

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

42

43 **ABSTRACT:**

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

48

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

59

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

69

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

74 **KEY POINTS**

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

80 **WHY DOES THIS PAPER MATTER?**

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

90

91

92 INTRODUCTION

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

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

107 Shortly after shelter-in-place orders were enacted, several primary care practices in
108 our area identified that many older patients were lacking in basic needs, and
109 performed outreach calls to identify these needs and connect patients to resources
110 when needed. Patients were specifically asked about missing medication refills,
111 medical supplies, groceries, and caregivers, as these were needs that were
112 identified as frequently being disrupted, potentially life-threatening, and areas in
113 which providers or social services could likely intervene. During this time, practices
114 prepared to change how care would be delivered, from almost exclusively in-person
115 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

129 **METHODS**

130 **Setting**

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

141 **Participants**

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

152 **Measurements**

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

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

167 **Data collection**

168 Via chart review of electronic [health-medical](#) records, we abstracted data on factors
169 that might affect unmet needs including demographics (age calculated from date of
170 birth, self-identified gender, self-identified race and ethnicity, ZIP code, insurance
171 type, and primary language); we used AskCHIS to obtain zip code-level data on
172 percentage of adults living under the federal poverty level, and stratified zip codes
173 into four quartiles based into those with higher and lower local rates of poverty
174 (<7.5% of adults in the zip code living under the federal poverty level, 7.5-10%, 10.1-
175 12.5%, and >12.5%).¹⁵ We abstracted information about medical conditions that we
176 believed might affect the prevalence of unmet needs or determine the severity of its
177 impact as present or not (hypertension, HIV, diabetes, heart failure, coronary artery

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

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

189 **Statistical analysis**

190 Descriptive statistics were used to characterize the sample and assess frequencies
191 of unmet needs. Bivariate analysis was performed to report on differences between
192 clinic sites with regard to patient demographic and medical conditions. Bivariate
193 analyses were also done to examine association between demographic
194 characteristics and unmet needs. We set statistical significance at $p < 0.05$ (two-
195 sided). Multivariate analysis was performed in mixed-effects models, adjusting for
196 age, gender, clinical site and insurance status. Analyses were performed using SAS
197 9.4 (SAS Institute, Inc.). All study procedures were approved by the UCSF IRB.

198 **RESULTS**

199 **Sample characteristics**

200 Among the four clinic sites, 546 people received an outreach call and were reached
201 successfully, of which 136 (24.9%) were from home-based primary care, 199
202 (36.5%) from geriatric primary care, 143 (26.2%) from the adult medicine clinic in the

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

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

214

215 **Unmet needs**

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

224

225 **Unmet needs by demographics**

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

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

230 Unmet health-related needs were the highest among self-identified Asian people
231 (36.4%) compared with other racial groups, except for American Indian/Alaska
232 Native (50.0%) for which there were only 2 people in the cohort. Among those
233 identifying as Asian, there was a different prevalence of unmet health-related needs
234 among speakers by Asian languages: Cantonese (57.5%), Vietnamese (50.0%,
235 $n=4$), Tagalog (44.4%) and Mandarin (36.8%). Among those who identified as Asian
236 and their preferred language was an Asian language, 46.9% (38/81) reported an
237 unmet health-related need, versus 24.3% (17/70) of those who identified as Asian
238 but who preferred English (data not shown in tables).

239 Among different age groups, the youngest, 61-70, had the highest unmet health-
240 related needs (37.8%). For health-related and access-related needs combined,
241 those between 61-70 years old and 100+ had more unmet needs (71.9% and 75.0%,
242 $n=3$ for 100+) than those between 71-80 (61.1%), 81-90 (53.4%) and 91-100 years
243 old (64.0%) ($p < 0.05$, data not shown).

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

249 There were also differences by quartile of zip code-level poverty, with more people in
250 each group of increasing quartile of zip-code poverty having more unmet health-
251 related needs: 30.8% in those living in zip codes with the highest rates of poverty vs.
252 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

278 **DISCUSSION**

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

294

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

303

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

310

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

317

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

325

326 **Strengths and limitations**

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

344

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

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

353

354 **CONCLUSION**

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

367 **Conflict of Interest:**

368 All authors have no potential conflicts of interest to declare.

369

370 **Author Contributions:**

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

376

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480

481 Supplemental material includes three tables:

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

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

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

487

488

489

490 **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)

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

492

493

494

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)	

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

496 **Chi-square test of Independence results or Fisher's Test, significance level set at
497 0.05; Data on gender, race and ethnicity were all self-reported, collected at the time
498 of registration with the clinical practice. These were existing categories in the EMR.
499 P-values represent difference between subgroups by demographic.

500 ***Percentages listed are row percentages.

501

502 **Figure 1. Participants' unmet needs by clinic site**

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

504 Needs medication refills

505 Needs medical supplies

506 Food insecurity

507 Any unmet need

508

509 From left to right on second bar graph:

510 Not ready for telehealth

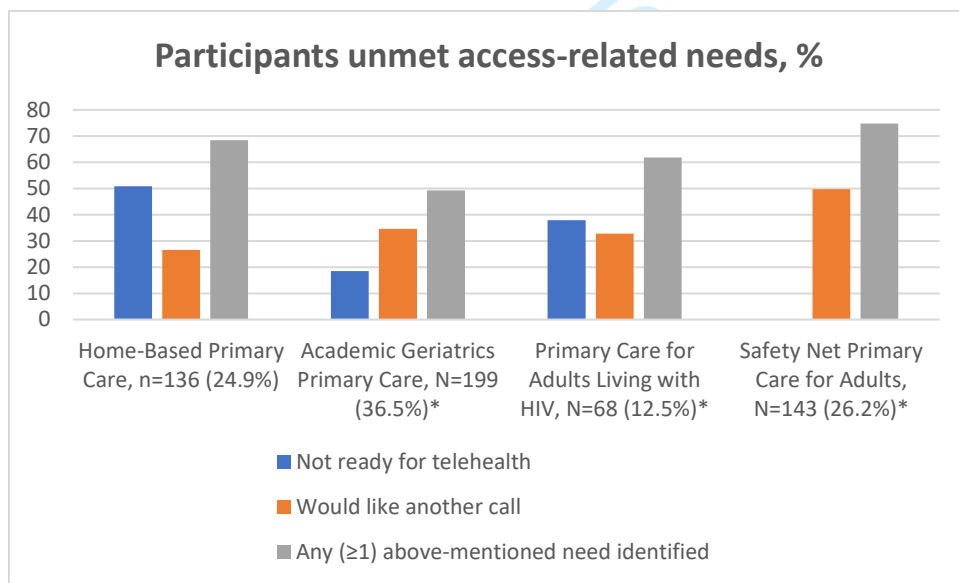
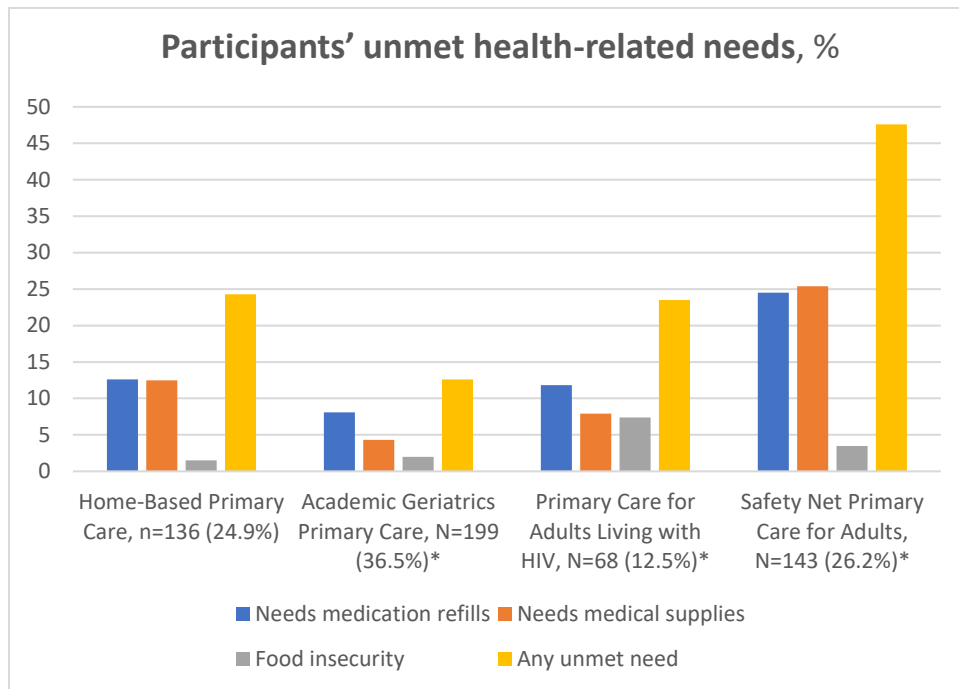
511 Would like another call

512 Any (≥ 1) above-mentioned need identified

For Review Only

For Review Only

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

	Total	Clinic sites				Differences between sites (P-value)**
		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%)*	
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

1 **Unmet health-related needs of community-dwelling older adults during COVID-**
2 **19 lockdown in a diverse urban cohort**

3
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31 Running head: Unmet Health Related Needs During COVID

32

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

34

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

40

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

42

43 **ABSTRACT:**

44 **BACKGROUND:** Shelter-in-place orders during the COVID-19 pandemic created
45 unmet health-related and access-related needs among older adults. We sought to
46 understand the prevalence of these needs among community dwelling older adults.
47

48 **METHODS:** We performed a retrospective chart review of pandemic-related
49 outreach calls to older adults between March and July 2020 at four urban, primary
50 care clinics: a home-based practice, a safety-net adult medicine clinic, an academic
51 geriatrics practice, and a safety-net clinic for adults living with HIV. Participants
52 included those 60 or older at three sites, and those 65 or older with a chronic health
53 condition at the fourth. We describe unmet health-related needs (the need for
54 medication refills, medical supplies, or food) and access-related needs (ability to
55 perform a telehealth visit, need for a call back from the primary care provider). We
56 performed bivariate and multivariate analyses to examine the association between
57 unmet needs and demographics, medical conditions, and health care utilization.
58

59 **RESULTS:** Sixty-two percent of people had at least one unmet need. Twenty-six
60 percent had at least one unmet health-related need; 14.0% needed medication
61 refills, 12.5% needed medical supplies, and 3.0% had food insecurity. Among
62 access-related needs, 33% were not ready for video visits, and 36.4% asked for a
63 return call from their provider. Prevalence of any unmet health-related need was the
64 highest among Asian vs. white (36.4% vs. 19.1%) and in the highest vs. lowest
65 poverty zip codes (30.8% vs. 18.2%). Those with diabetes and COPD had higher
66 unmet health-related needs than those without, and there was no change in health
67 care utilization.
68

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

73 **KEY POINTS**

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

79 **WHY DOES THIS PAPER MATTER?**

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

89

90

91 INTRODUCTION

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

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

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

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

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

127

128 **METHODS**

129 **Setting**

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

140 **Participants**

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

151 **Measurements**

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

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

166 **Data collection**

167 Via chart review of electronic medical records, we abstracted data on factors that
168 might affect unmet needs including demographics (age calculated from date of birth,
169 self-identified gender, self-identified race and ethnicity, ZIP code, insurance type,
170 and primary language); we used AskCHIS to obtain zip code-level data on
171 percentage of adults living under the federal poverty level, and stratified zip codes
172 into four quartiles based into those with higher and lower local rates of poverty
173 (<7.5% of adults in the zip code living under the federal poverty level, 7.5-10%, 10.1-
174 12.5%, and >12.5%).¹⁵ We abstracted information about medical conditions that we
175 believed might affect the prevalence of unmet needs or determine the severity of its
176 impact as present or not (hypertension, HIV, diabetes, heart failure, coronary artery

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

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

188 **Statistical analysis**

189 Descriptive statistics were used to characterize the sample and assess frequencies
190 of unmet needs. Bivariate analysis was performed to report on differences between
191 clinic sites with regard to patient demographic and medical conditions. Bivariate
192 analyses were also done to examine association between demographic
193 characteristics and unmet needs. We set statistical significance at $p < 0.05$ (two-
194 sided). Multivariate analysis was performed in mixed-effects models, adjusting for
195 age, gender, clinical site and insurance status. Analyses were performed using SAS
196 9.4 (SAS Institute, Inc.). All study procedures were approved by the UCSF IRB.

197 **RESULTS**

198 **Sample characteristics**

199 Among the four clinic sites, 546 people received an outreach call and were reached
200 successfully, of which 136 (24.9%) were from home-based primary care, 199
201 (36.5%) from geriatric primary care, 143 (26.2%) from the adult medicine clinic in the

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

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

213

214 **Unmet needs**

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

223

224 **Unmet needs by demographics**

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

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

229 Unmet health-related needs were the highest among self-identified Asian people
230 (36.4%) compared with other racial groups, except for American Indian/Alaska
231 Native (50.0%) for which there were only 2 people in the cohort. Among those
232 identifying as Asian, there was a different prevalence of unmet health-related needs
233 among speakers by Asian languages: Cantonese (57.5%), Vietnamese (50.0%,
234 $n=4$), Tagalog (44.4%) and Mandarin (36.8%). Among those who identified as Asian
235 and their preferred language was an Asian language, 46.9% (38/81) reported an
236 unmet health-related need, versus 24.3% (17/70) of those who identified as Asian
237 but who preferred English (data not shown in tables).

238 Among different age groups, the youngest, 61-70, had the highest unmet health-
239 related needs (37.8%). For health-related and access-related needs combined,
240 those between 61-70 years old and 100+ had more unmet needs (71.9% and 75.0%,
241 $n=3$ for 100+) than those between 71-80 (61.1%), 81-90 (53.4%) and 91-100 years
242 old (64.0%) ($p < 0.05$, data not shown).

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

248 There were also differences by quartile of zip code-level poverty, with more people in
249 each group of increasing quartile of zip-code poverty having more unmet health-
250 related needs: 30.8% in those living in zip codes with the highest rates of poverty vs.
251 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

277 DISCUSSION

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

293

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

302

303 While younger, more robust adults are often able to find alternate solutions during
304 times of crisis, older adults who rely on community programs and social services to
305 meet their basic needs are often more vulnerable during times of communal crisis.^{8,18}

306 Going forward, pandemic preparedness could better anticipate the needs of
307 vulnerable older adults when addressing the disruption of usual services to mitigate
308 the impact of this crisis on our communities, cities, and counties.

309

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

316

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

324

325 **Strengths and limitations**

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

343

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

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

352

353 **CONCLUSION**

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

366 **Conflict of Interest:**

367 All authors have no potential conflicts of interest to declare.

368

369 **Author Contributions:**

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

375

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380

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386

387

388

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479

480 Supplemental material includes three tables:

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

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

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

486

487

488

489 **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)

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

491

492

493

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)	

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

495 **Chi-square test of Independence results or Fisher's Test, significance level set at
496 0.05; Data on gender, race and ethnicity were all self-reported, collected at the time
497 of registration with the clinical practice. These were existing categories in the EMR.
498 P-values represent difference between subgroups by demographic.

499 ***Percentages listed are row percentages.

500

501 **Figure 1. Participants' unmet needs by clinic site**

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

503 Needs medication refills

504 Needs medical supplies

505 Food insecurity

506 Any unmet need

507

508 From left to right on second bar graph:

509 Not ready for telehealth

510 Would like another call

511 Any (≥ 1) above-mentioned need identified

For Review Only