

“Double whammy”: A rapid review of rural vs urban psychosocial cancer experiences and telehealth service in 5 countries during the COVID-19 pandemic

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BACKGROUND: Cancer is a long-term condition with biopsychosocial components. People with cancer living in rural areas can have poorer treatment outcomes and higher rates of unmet psychosocial needs than those in urban areas. Cancer, as opposed to other chronic conditions, poses a unique challenge in this current COVID-19 pandemic context, given immunocompromised states of patients and long-term survivor treatment effects. The disaggregated impact of psychosocial issues potentiated by the pandemic on rural versus urban cancer populations is yet to be quantified. This rapid review investigates whether i) people with cancer are experiencing pandemic-related psychosocial impacts, ii) these impacts are equivalent in urban and rural locations, and iii) whether the rapid update of telehealth mitigates or reinforces any identified impacts. **METHOD:** A rapid review was conducted for literature published between December 2019 and 13 August 2021.

RESULTS: 15 papers were included, incorporating evidence from five countries. The available literature suggests people affected by cancer living in rural areas are evidencing disproportionate psychosocial impacts of COVID-19, compounding cancer experiences. Despite its widespread and necessary use during the pandemic, telehealth was identified as an additional challenge for rural people with cancer. **CONCLUSIONS:** Clinicians working with rural people affected by cancer should ensure recognition of the greater risks of psychosocial concerns in their rural patients, and reduced access to health services. Whilst telehealth and other remote technologies are useful and necessary in this pandemic era, clinicians should consider whether its use benefits their rural clients or reinforces existing disparities.

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2 **“Double whammy”: A Rapid Review of Rural vs Urban**
3 **Psychosocial Cancer Experiences and Telehealth**
4 **Service in 5 Countries During the COVID-19 Pandemic**
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19 **Abstract**

20 BACKGROUND: Cancer is a long-term condition with biopsychosocial components. People
21 with cancer living in rural areas can have poorer treatment outcomes and higher rates of unmet
22 psychosocial needs than those in urban areas. Cancer, as opposed to other chronic conditions,
23 poses a unique challenge in this current COVID-19 pandemic context, given
24 immunocompromised states of patients and long-term survivor treatment effects. The
25 disaggregated impact of psychosocial issues potentiated by the pandemic on rural versus urban
26 cancer populations is yet to be quantified. This rapid review investigates whether i) people with
27 cancer are experiencing pandemic-related psychosocial impacts, ii) these impacts are equivalent
28 in urban and rural locations, and iii) whether the rapid update of telehealth mitigates or reinforces
29 any identified impacts. METHOD: A rapid review was conducted for literature published
30 between December 2019 and 13 August 2021. RESULTS: 15 papers were included,
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32 cancer living in rural areas are evidencing disproportionate psychosocial impacts of COVID-19,
33 compounding cancer experiences. Despite its widespread and necessary use during the
34 pandemic, telehealth was identified as an additional challenge for rural people with cancer.
35 CONCLUSIONS: Clinicians working with rural people affected by cancer should ensure
36 recognition of the greater risks of psychosocial concerns in their rural patients, and reduced
37 access to health services. Whilst telehealth and other remote technologies are useful and

38 necessary in this pandemic era, clinicians should consider whether its use benefits their rural
39 clients or reinforces existing disparities.

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41 KEY WORDS: cancer, COVID-19, distress, psycho-oncology, psychosocial, rural, telehealth,
42 wellbeing

43

44 Introduction

45 With increased rates of survivorship, cancer is considered a long-term condition with biological,
46 psychological and social components (Institute of Medicine, 2008). It is known that people with
47 cancer, and those who care for them, exhibit high levels of distress and other mental health
48 complications throughout the course of their cancer journey (Recklitis & Syrjala, 2017) which
49 often persist beyond completion of medical treatment (Lu et al., 2016). Psychosocial stressors
50 (e.g. emotional distress, role change, adjustment difficulties, financial and employment
51 insecurity) have been associated with poorer functional outcomes for cancer survivors, with
52 evidence of bi-directional and cumulative effects (Institute of Medicine, 2008).

53 From its first declaration as a pandemic by the WHO (World Health Organisation [WHO], 2020a)
54 in March 2020, healthcare service delivery has been severely altered and impacted in every
55 country around the world by the emergence of the COVID-19 virus. The pandemic has
56 potentiated multiple psychosocial stressors through its impact not only on health, but also on
57 employment, finances, access to services and social support. Evidence of a disproportionate
58 psychosocial and medical impact of this pandemic on those with non-COVID conditions,
59 particularly chronic conditions such as cancer, is just emerging (Boakye et al., 2020). Across the
60 world, the appropriate and necessary prioritization of the COVID-19 response has meant that
61 there have been significant disruptions to the treatment, management, rehabilitation, and follow-
62 up of other medical conditions, including the necessary care for cancer (World Health
63 Organisation, 2020b). Moreover, irrespective of their unmet cancer care needs, research also
64 indicates that people with cancer are at a higher risk of contracting COVID-19 itself and
65 experiencing disproportionately higher adverse sequelae (Liang et al., 2020). Those with
66 cancer, therefore, are a highly vulnerable group that warrant particular attention by psycho-
67 oncology teams. Given the systemic immunosuppressive state of people with cancer (Liang et
68 al., 2020), it follows that people with cancer may feel highly anxious about contracting COVID-
69 19 itself, and justifiably fearful of experiencing serious (and possibly fatal) complications from
70 the virus. Significant mental health problem prevalence, and gaps in mental health supports, for
71 cancer populations have been observed during the pandemic response (Wang et al., 2020).
72 There has also been some suggestion that cancer patients and survivors are at risk of fears
73 resurfacing of prior traumatic medical experiences (Nekhlyudov et al., 2020). The pandemic has
74 been described as “uncertainty upon uncertainty” for people with cancer, with multi-pronged
75 psychosocial ramifications (Young et al., 2020).

76

77 Even prior to the pandemic, research indicated that anxiety reduced the quality of life for people
78 with cancer and negatively impacted treatment compliance (Greer et al., 2008). A self-
79 perpetuating cycle of pandemic-induced anxiety and risk-mitigating behavioural changes (e.g.,
80 social avoidance), coupled with strategies designed to reduce virus spread such as physical

81 distancing and isolation, seems likely to occur. The immune-compromised state of people with
82 cancer, and the existence of late effects of cancer treatments in cancer survivors, such as
83 reduced lung function (Carver et al., 2007), compound these challenges in comparison to other
84 chronic diseases. Given that behavioural strategies of avoidance and withdrawal are central
85 maintaining factors within cognitive behavioural models of anxiety (e.g. Clark, 1986) and
86 depressive disorders (e.g. Moorey, 2010), it is likely that cancer populations living through this
87 pandemic are psychologically, as well as medically, vulnerable.

88

89 The psychosocial issues experienced by those with cancer are heterogeneous, and there are
90 health and wellbeing disparities in existence amongst different cancer populations and groups
91 (Carethers et al., 2020). An international meta-analysis identified significant health inequality
92 between rural and urban cancer populations, specifically those living in rural areas are
93 significantly more likely to die from cancer than their urban counterparts with social ecological
94 mechanisms underlying this including individual, institution, community and policy level factors
95 (Carriere et al., 2018). This is not just limited to adults, with some evidence that rural paediatric
96 cancer patients experience poorer treatment experiences and outcomes (Tarnasky et al., 2021).
97 A recent Australian report (NSW Parliament, 2022) outlined that, even prior to COVID-19, the
98 limited availability of primary care and GP services in regional areas in New South Wales has
99 meant that opportunities for early intervention are being lost, and that when individuals do
100 eventually access medical assistance they then generally require more acute and complex care.
101 Moreover, the disparate nature of service provision for the treatment or prevention of cancer,
102 even prior to the challenges the pandemic threw at healthcare provision, has required rural
103 people to engage with multiple services and providers where the risk of poor communication
104 can result in rural people with cancer getting “lost in the system” (NSW Parliament, 2022).
105 Limited and fragmented supportive care spread across different providers and locations is an
106 ongoing challenge for all rural people, but ultimately places rural people with cancer at
107 disproportionate risk of burden by psychosocial stressors, compounded by poorer access to
108 psychosocial supports.

109

110 Defining what is “rural” differs from country to country, with varying synonyms and location-
111 specific definitions (e.g. regional, remote, non-urban, non-metropolitan) utilised in the literature,
112 and these definitions can also be conflicting leading to confusion and challenges when
113 attempting to compare data (Bennett et al., 2019). For example, studies from Australia may
114 conceptualise distance to the closest metropolitan centre very differently to studies from the
115 United Kingdom. Hence, it is appropriate to take a place-based approach to understanding the
116 psychosocial support needs of people with cancer during this pandemic, given the additional
117 challenges COVID-19 and its management brings. For the purposes of this article, the term
118 ‘rural’ will be used consistently throughout given the literature reviewed utilises varying terms to
119 refer to people living outside of metropolitan centres with reduced accessibility of specialist
120 services.

121

122 In Australia and across the world, rapid transition to remote service delivery models via
123 telehealth has been necessary as a result of measures (e.g., physical distancing) designed to
124 reduce transmission of COVID-19 (Thomas et al., 2020). What is becoming clear, however, is

125 that this transition has not necessarily improved equitable access to services across disparate
126 geographical regions. Countries with ready access to broadband and digital devices have been
127 enabled to move more quickly into the remote service provision space, whilst other countries
128 (and even socially disadvantaged locations within technologically-advanced countries) lacked
129 the infrastructure, hardware and technical resources to modify their practices (Webster, 2020).
130 For Australia, equivalent levels of distress in rural and urban cancer populations (e.g. Van Der
131 Kruk et al., 2021) is not necessarily associated with equivalent service provision (NSW
132 Parliament, 2022). There has been some research identifying disparities in cancer care and
133 outcomes between urban and rural areas (e.g., Butow et al., 2012), and telehealth is recognised
134 as an additional barrier for vulnerable populations such as Aboriginal Australians (NSW
135 Parliament, 2022). Hence the question remains as to whether the COVID-19 era of service
136 provision is perpetuating or mitigating these disparities.

137

138 There may be inadvertent “positives” to being rurally located in these times. For example,
139 telehealth will likely have significantly reduced travel time associated with some health care
140 appointments for those in rural areas. There may also be benefits of rural lifestyle in terms of
141 COVID-19 transmission as a result of reduced density living and fewer government restrictions
142 on social contact and travel. However, given the recent spread of the highly transmissible
143 COVID-19 variants throughout regional Australia (NSW Health, 2021), for example, there are
144 risks to the maintenance of the feeling of relative safety in rural communities.

145

146 There are, however, indications of wide-ranging impacts of the COVID-19 pandemic on
147 physical, psychosocial and economic wellbeing of people with cancer, compounded by cancer
148 treatment itself, in the context of the ‘new normal’ of social distancing and uncertainty (Jammu
149 et al., 2021). Cancer survivors who have completed treatment are an additional necessary
150 consideration in this pandemic, given persistent mental health issues are well-recognised within
151 this group (Lu et al., 2016). Identifying vulnerable client groups is imperative, alongside the
152 prioritisation of COVID-19, to ensure appropriate interventions are made available and
153 healthcare systems can prioritise additional identified care needs when resources become
154 available (Boakye et al., 2020). Rapid reviews are recommended by the WHO to provide timely,
155 high-quality evidence in order to support decision-making in health policy and systems (Tricco et
156 al., 2017). As the WHO (2021, para. 4) argued, this will allow services to “build back better” for
157 the future, for both cancer patients, survivors, and those who care for them.

158

159

Aim

160 This rapid review aims to understand i) if people with cancer are experiencing pandemic-related
161 psychosocial impacts, ii) whether these impacts are equivalent amongst people affected by
162 cancer in urban versus rural locations, and iii) whether service delivery changes driven by the
163 pandemic mitigate or exacerbate the challenges faced by rural people affected by cancer (e.g.
164 access to specialist services), potentially resulting in compounded distress due to the cancer
165 journey itself and the impacts of living within this pandemic era. This rapid review aims to
166 foreground the experience of rural people with cancer in order to contribute to the understanding
167 of the impacts of psychosocial stressors associated with COVID-19 on cancer journey
168 experiences. Results may support the redirection of strengthened health service provision to

169 support those with cancer and their families and carers living in rural areas. This rapid review
170 will present the findings of the literature published to 13 August 2021, recognising that as the
171 pandemic progresses and countries are experiencing multiple waves of the virus, the literature
172 will evolve.

173

174 **Materials & Methods**

175 ***Search strategy***

176 The WHO's guidelines for rapid reviews (Tricco et al., 2017) and the recommendations of the
177 Cochrane Group for rapid reviews during COVID-19 (Garrity et al., 2020) were utilised to inform
178 this review. One author (MB) utilised the pre-established search strategy to search across the
179 following databases: ProQuest and Informit; PubMed; the Semantic Scholar COVID-19
180 database CORD-19; and Google Scholar. Limited iterative searching from reference lists was
181 undertaken of articles published after December 2019 on psycho-oncology during COVID-19
182 comparing rural and urban populations in order to identify additional relevant articles. Articles
183 were excluded if the study did not include the COVID-19 pandemic or were solely focussed on
184 urban or non-segmented populations. Duplicate records were systematically identified and
185 removed. Identification of eligible studies took place in two stages; selection based on study
186 titles and abstracts, followed by detailed review of the full-text articles, utilising Covidence
187 software (Veritas Health Innovation, 2021). Discrepancies and general queries were resolved
188 through consensus of all authors. The search strategy was executed 8-13 August 2021 for
189 articles available in English, utilising the following search strings in Title or Abstract "COVID-19"
190 AND cancer AND psychosocial AND "rural OR regional OR remote". For example, in PubMed
191 the following search string was utilized: (((((COVID-19[Title/Abstract]) AND
192 (psychosocial[Title/Abstract])) AND (cancer[Title/Abstract])) OR (rural[Title/Abstract])) OR
193 (regional[Title/Abstract])) OR (remote[Title/Abstract]). Given COVID-19 was first identified in late
194 2019, the search was limited to literature published between December 2019 and 13 August
195 2021.

196

197 ***Inclusion and Exclusion of Studies***

198 Of the 1451 articles identified, titles and abstracts were reviewed for inclusion as rural psycho-
199 oncology studies during the COVID-19 pandemic published after December 2019. This date
200 was chosen as some countries may have been beginning to gather and publish data earlier than
201 when the WHO proclaimed a pandemic and some countries were affected earlier than others by
202 the spread of COVID-19. Given the purpose of this rapid review was to provide clinicians with a
203 useful synthesis of information as quickly as possible in this unprecedented pandemic context,
204 as many sources of information and data were sought as possible. Hence criteria were
205 deliberately designed to be broad and encompassing. Studies that did not refer specifically to
206 the impact of the pandemic were excluded to ensure the analysis was only pandemic focused.
207 Only studies allowing review of rural populations were included. Literature with quantitative data
208 that did not disaggregate rural and urban were excluded.

209

210 ***Analysis***

211 One author (MB) extracted study details and data from the eligible studies. As is common in
212 rapid reviews, the quality of the included studies was not appraised, which does not necessarily

213 impact upon conclusion congruence of rapid and systematic reviews (Tricco et al., 2015).
214 However, included literature was rated as either Tier 1 (peer-reviewed work, such as published
215 cross-sectional studies) or Tier 2 (minimally peer-reviewed, such as expert opinion). Eleven
216 articles were Tier 1 articles and four were judged as Tier 2. Of the Tier 2, two were oral
217 presentation abstracts of cross-sectional study data and two were expert narrative opinion.
218 Literature ratings were derived by consensus of all authors. A narrative synthesis of the results
219 and conclusions of the eligible studies was conducted.

220

221 **Results**

222 Based on the above selection criteria, and after duplicates were removed, the full text of 98
223 articles were reviewed. After reviewing article results and discussion, those that did not report
224 rural results or did not report rural data relevant to the review aims, were removed, yielding 15
225 articles for inclusion in the narrative synthesis. Of the 15 articles, 10 considered psycho-
226 oncology aspects of wellbeing, and 5 considered telehealth technologies. The articles originated
227 from the USA ($n = 7$), Australia ($n = 4$), India ($n = 2$), Italy ($n = 1$), and Canada ($n = 1$). Table 1
228 shows that of the ten studies exploring psychosocial issues, seven analysed cross-sectional
229 data of urban and rural populations, two analysed a rural-only population, and one was an
230 expert opinion. Two of the cross-sectional studies included some qualitative data in a mixed
231 methods design. Seven articles were assessed as Tier 1 and three as Tier 2. There was
232 consensus amongst the Tier 1 and Tier 2 literature. However, of the Tier 2 articles, two were
233 oral presentation abstracts of cross-sectional research data and one was an expert narrative
234 opinion, for which greater caution should be utilised in its interpretation.

235

236 When considering pandemic-related psychosocial issues experienced by people with cancer, all
237 ten articles evinced a myriad of psychosocial concerns experienced by people with cancer in the
238 context of the pandemic, ranging from worry and distress (e.g., Davis et al., 2021) to health
239 access and burden (Singh et al., 2020), addressing this review's first aim. When considering this
240 review's second aim of comparing the psychosocial experiences of rural versus urban people
241 with cancer, the results indicate significant disparities with less favourable outcomes for rural
242 populations. Of the nine quantitative studies, three (two Australia, one USA) reported poorer
243 emotional wellbeing for rural patients (Davis et al., 2021; Mama et al., 2020; Zomerdiijk et al.,
244 2021), and this was similarly identified in the expert opinion (Boakye et al., 2020). Davis et al
245 (2021) further noted older rural participants reported greater negative impacts on access and
246 wellbeing than younger participants. Two studies (one USA and one Italy) reported reduced
247 perceptions of quality of life for rural cancer populations (Ferrara et al., 2021; Mama et al.,
248 2020), and one USA study identified more social disconnectedness in those living in rural areas
249 (Jacobs & Ellis, 2021). Three studies considered health service access, with two studies (India)
250 evidencing significantly reduced health care access and increased care delays in those from
251 rural areas compared to their urban counterparts during the pandemic (Singh et al., 2020; Singh
252 et al., 2021). The results from the qualitative data of one Canadian study (Galica et al., 2021)
253 suggested whilst some supportive care access may have ceased, some older rural cancer
254 survivors appreciated a sense of insulation against COVID-19 as a function of their geography.
255 This protective effect of geography was also found in one USA study (Daniels et al., 2021),
256 wherein the urban sample reported feeling more at risk of contracting COVID-19, and

257 experienced greater daily life change, than the rural sample. Overall, however, social and health
258 support access, and psychological distress-related symptoms were most likely to be worse in
259 rural samples, with older people particularly impacted, during the COVID-19 pandemic.

260

261 The final aim of the review considered whether the rapid move to telehealth service delivery
262 mitigates or reinforces the service provision inequities which in turn lead to disproportionate
263 burden of adverse psychosocial inequities experienced by rural people with cancer. Five studies
264 considering telehealth use during COVID-19 were reviewed. These included one Tier 2 expert
265 opinion (Australia) and four Tier 1 studies, of which one was a mixed methods study (Australia),
266 two were cross-sectional studies (USA) and one was a retrospective study (USA). All five
267 articles recognised that the use of telehealth during the COVID-19 pandemic could go some
268 way to improving health equity and bringing psychosocial and economic benefits to rural cancer
269 populations, including reducing travel time and travel costs and increasing access to health and
270 care providers (Brunelli et al., 2021; Jewett et al., 2021; Keefe et al., 2020; Patt et al., 2021;
271 Rariy et al., 2021). However, all the Tier 1 studies identified challenges with telehealth that may
272 impact upon the above benefits. Three USA studies found inadequate technology access and
273 capabilities were problematic for rural cancer populations (Jewett et al., 2021; Patt et al., 2021;
274 Rariy et al., 2021). Furthermore, one of the studies identified significantly reduced uptake of
275 telehealth by rural cancer patients (Jewett et al., 2021), and an Australian study (Brunelli et al.,
276 2021) found that whilst both rural and metropolitan healthcare providers held positive attitudes
277 towards telehealth use, clinician uptake remained low.

278

279 **Discussion**

280 This rapid review identified that people with cancer are experiencing a “double whammy” of
281 COVID-19 disease risk burden and psychosocial impact. The immunocompromised state of
282 patients and the impact of long-term treatment effects in survivors, that is not similarly
283 experienced in other chronic conditions, makes this population in high need of consideration.
284 This rapid review further examined the experience of rural people with cancer during the
285 COVID-19 pandemic and found that the psychosocial wellbeing of rural people is
286 disproportionately impacted. Moreover, strategies to mitigate pandemic impacts, such as
287 telehealth, are not automatically adequate for rural people with cancer, with deliberate care
288 required to ensure appropriateness for individual client circumstances. There may be some
289 protective factors associated with insulation as result of ‘ruralness’, some of which appear linked
290 to the limited spread of COVID-19 in rural communities, in contrast to the higher rates of
291 transmission in urban areas predominately in the early days of the pandemic. However, the
292 virus is now increasingly less urban-centric, and has spread quickly to regional, rural and
293 remote communities (Bradford et al., 2021). As the virus continues to spread and governments
294 are hoping to achieve endemic virus status, this may reduce the sense of relative safety in rural
295 communities. Further, the healthcare resources of rural towns are minimal compared to urban
296 centres (e.g., NSW Parliament, 2022). Rural hospitals have relatively reduced contingency and
297 greater vulnerability to becoming overwhelmed with the COVID-19 burden, resulting in flow-on
298 effects to primary health settings and impacts to continuity of care for rural people affected by
299 cancer in addition to exacerbation of their psychosocial concerns.

300

301 Psychosocial Impacts

302 As per the first aim, the studies reviewed indicate that in general, people with cancer are facing
303 pandemic-related psychosocial impacts alongside their existing cancer experiences. Secondly,
304 the evidence suggests that rural cancer patients are a particularly vulnerable population in terms
305 of their risk of adverse psychosocial sequelae during this pandemic, which adds an additional
306 layer of complexity to any vulnerabilities to poorer COVID-19 health outcomes that may be
307 inherent in people who have contracted the virus and have cancer as an underlying health
308 condition. Moreover, the present review suggests a reoccurring theme where rural populations
309 with cancer appear to be experiencing disproportionate psychosocial impacts of the COVID-19
310 pandemic compared to comparable urban populations. Rural people with cancer, more than
311 their urban counterparts, are experiencing disproportionately increased social disconnectedness
312 (Jacobs & Ellis, 2021), and greater psychological distress (Zomerdijk et al., 2021) in this
313 pandemic, in conjunction with their existing cancer burden. This combination of internal
314 psychological factors, and external social factors, unduly burdens rural people affected by
315 cancer living through the COVID-19 pandemic with compounding psychosocial difficulties. The
316 mutually exacerbating nature of psychosocial stressors and distress, including poor mental
317 health (Mama et al., 2020) and limited social supports, and the burden of the cancer experience
318 journey itself, compounds the “double whammy” experienced by rural people with cancer in the
319 context of COVID-19. Cancer-related, pandemic-related, and virus-related anxiety and distress
320 are not just being experienced by rural people with cancer, with the services designed to
321 support them also having been impacted by the pandemic. Davis et al (2021) found that social
322 support for this group has reduced significantly, likely associated with psychological distress.
323 Moreover, reduced access to health care providers and supportive service access means that
324 getting the right support for psychosocial difficulties is more challenging, especially when
325 services cease (Galica et al., 2021), access is disrupted or delayed (Davis et al., 2021; Singh et
326 al., 2020; Singh et al., 2021), care provision is uncertain with imposed pandemic restrictions
327 (Zomerdijk et al., 2021) and there is a shortage of mental health professionals (Boakye et al.,
328 2020). The heightened sense of vulnerability and intensified fears means psycho-oncology
329 services are more necessary than ever for rural people affected by cancer, regardless of their
330 stage of diagnosis or treatment.

331
332 Whilst the literature suggests that rural people generally appear to be disproportionately
333 impacted by this pandemic, older people with cancer in rural areas have been identified as
334 being more vulnerable (e.g., in terms of service access and overall wellbeing) than younger
335 people (Davis et al., 2021). Clear risks of medical and supportive care ceasing (Galica et al.,
336 2021) have been identified for this group. Despite the well-established need for psychosocial
337 supports and intervention particularly in this unprecedented context, reduced help-seeking has
338 been identified as an issue for rural people with cancer (Boakye et al., 2020), which has likely
339 compounded by negative perceptions of access and pandemic-management strategies such as
340 lockdowns, social avoidance and isolation. The impact of the pandemic for rural people with
341 cancer has additionally resulted in this population experiencing more pessimistic perceptions of
342 quality of life (Ferrara et al., 2021). The long-term effects of these compound effects on health
343 and wellbeing are yet to be seen.

344

345 ***Telehealth in COVID-19***

346 Telehealth is often touted as the solution to over-coming barriers to accessing services for rural
347 people, and it is a welcome addition to the provision of both medical and psychosocial care. Its
348 utilisation has been shown to improve equity of access to care (Keefe et al., 2020), reduce
349 waiting times and travel time, distance, and costs (Rariy et al., 2021), and reduce burden by
350 increasing independence and convenience (Brunelli et al., 2021). The rollout of telehealth in
351 oncology supports continuity of clinical care, as well as providing an avenue for psychosocial
352 care (Boakye et al., 2020).

353

354 In consideration of this paper's third aim, whilst telehealth provides some benefit to some rural
355 people with cancer, the findings of this review indicate that telehealth may also reinforce health
356 inequities for other rural people, due to disparities in access to reliable technology and
357 infrastructure required for effective service delivery. Even prior to the pandemic, challenges for
358 telehealth delivery in cancer care and psycho-oncology services were recognised, including
359 issues relating to standardisation of quality care, patient comfort with technology use, and
360 ensuring privacy as well as emotional safety (Jhaveri et al., 2020). However, the rapid transition
361 to telehealth during the COVID-19 pandemic may have inadvertently exacerbated existing
362 disparities. Jewett and colleagues (2021) identified that despite reducing care logistics like travel
363 time, telehealth was less likely to be used by rural patients, and relatively poorer broadband
364 access limits the implementation of telemedicine for rural people (Patt et al., 2021). Challenges
365 are not limited to patients either. Even when telehealth can be useful for rural cancer patients,
366 there remains some reluctance on the part of health professionals to work via telehealth
367 (Brunelli et al., 2021). The availability of valuable, practical guides for establishing quality
368 telehealth consultations (e.g., Burbury et al., 2021) provide strong foundations for service
369 providers which are beneficial regardless of provider familiarity and comfort with this form of
370 practice. It is beyond the scope of this review to evaluate barriers to adoption of telehealth by
371 rural people and health professionals, but clearly this is an area requiring further research in the
372 interests of reducing health service inequities between rural and urban people with cancer.

373

374 ***Clinical Implications***

375 For clinicians working with people affected by cancer, a range of clinical implications have been
376 identified from the literature outlined in this review. Firstly, it is essential for cancer care
377 providers to screen for a range of psychosocial issues in their clients during this pandemic.
378 Mental health care is an important component of health care, and the incorporation of distress
379 screening is well-recognised in comprehensive cancer care guidelines (Fradgley et al., 2019).
380 There are many evidence-based tools available to healthcare providers depending on their
381 profession, from very simple measures such as a distress thermometer to more complex
382 inventories (National Comprehensive Cancer Network, 2020). However, even prior to the
383 pandemic, distress screening and intervention was piecemeal at best, with distress going
384 unassessed and undetected and ultimately untreated (Sanson-Fisher et al., 2000; Zucca et al.,
385 2015; Zucca et al., 2016). The importance of distress screening during the pandemic and
386 beyond is especially important for rural clients, and older people in particular, with the literature
387 suggesting they may be both more vulnerable to distress and more reluctant to seek help (Davis
388 et al., 2021). Clinicians should recognise the "double whammy" experienced by their rural

389 patients in the context of COVID-19 as it adds to the burden of patients and their families due to
390 the cumulative and compounding effects of psychosocial stressors.

391

392 Given that much of service provision is occurring utilising online platforms, clinicians require
393 specific skills in identifying evidence of distress remotely. Undertaking additional continuing
394 professional development and training in using telehealth for psychosocial intervention is
395 recommended. There may be some rural people who may be reluctant to disclose psychosocial
396 issues, and clinicians will benefit from proactively assessing engagement and responding to
397 barriers to help-seeking in this population. Appropriate referral making is key, with early referral
398 to psycho-oncology and psychosocial support services recommended.

399

400 Given the technology access issues that have been identified, clinicians should attempt to
401 overcome these barriers by offering alternatives for accessing help in rural areas. For example,
402 there may be capacity to offer service provision alternatives to support access to quality
403 technology, such as local hospital or community resources to improve bandwidth or quality
404 technology capabilities or supplementing telehealth with more reliable technologies such as
405 telephone, which should be explored. In Australia the Government moved quickly to design
406 Medicare telehealth items for GPs and Psychologists, and additional Psychology sessions
407 eligible for Medicare rebates, and clinicians and professional bodies advocated for these to
408 remain beyond the pandemic (Cavenett, 2021) to continue to mitigate some of the access gaps
409 where this is appropriate, particularly for rural people for whom telehealth is a welcome and
410 appropriate addition to their care.

411

412 Finally, the multidisciplinary opportunities inherent in healthcare settings remain a key resource
413 for supporting the psychological wellbeing of rural people with cancer, and this should be
414 emphasised in care and treatment plans from diagnosis through to survivorship. A recent NSW
415 Parliament report finding that people in rural, regional and remote areas of Australia are often
416 discharged from hospital with a lack of information and support (NSW Parliament, 2022), and
417 the health system strain caused by the pandemic is only likely to have exacerbated this.
418 Psycho-oncology care providers are well placed in assisting in the mitigation of the poorer
419 health outcomes that were identified as a result of this lack of information and support.

420

421 **Limitations**

422 The COVID-19 pandemic is ever-evolving, with multiple waves of virus transmission. This
423 results in episodes of high lifestyle impact for populations, for example through geographical
424 lockdowns and mask mandates. Hence, it is likely that disparities identified in this review will
425 also fluctuate as the pandemic continues to advance. We further recognise that more recently
426 published data may also provide information about the pandemic's impacts that differ from the
427 results presented here. Given the small numbers of studies of rural psycho-oncology generally,
428 in the context of rural psycho-oncology and COVID-19 specifically, especially longitudinal
429 studies, and the lack of formalised quality assessment of studies included in this review, more
430 rigorous systematic and meta-analytic reviews are required. A further limitation of the study is
431 the degree of heterogeneity in the definition of "rural" across countries. Broad generalisability of

432 findings across countries is difficult. However, the review highlights themes in the experience of
433 people living outside urban centres which may be common across disparate rural contexts.

434

435 **Conclusions**

436 The pandemic has inarguably interrupted health care provision AND altered health care delivery
437 for the foreseeable future and beyond. Hence the goal of “building back better”, including
438 considering how pre-pandemic support services and resources can be best utilised in this
439 potentially unpredictable pandemic future, should be a goal for all working in the psycho-
440 oncology space. Specifically, the available evidence suggests that people with cancer are
441 particularly medically and psychologically vulnerable during this pandemic, and rural people with
442 cancer more so. Rural people with cancer are experiencing greater psychosocial distress during
443 the pandemic than those living in urban areas. The necessary measures designed to limit the
444 transmission of the COVID-19 virus are having a disproportionate detrimental effect on rural
445 people with cancer, increasing social disconnectedness and reducing access to supportive
446 resources and health care professionals. Given that cancer is a biopsychosocial experience,
447 and the psychosocial needs of rural people with cancer are demonstrably greater than those of
448 people from urban areas, these needs require focussed clinical attention. If the psychosocial
449 needs of rural people with cancer are not effectively addressed, treatment inadequacy and
450 reduced functional outcomes are likely. To rectify the health inequity between rural and urban
451 cancer patients, this review clearly points to a need to improve and invest in appropriate
452 psychosocial support services for rural patients and their families.

453

454 The technology designed to support remote access to services is only a part solution, as the
455 infrastructure is not consistently available at a sufficiently high quality for rural people. There
456 also remains some challenges in telehealth uptake by both rural patients and clinicians.
457 Recognising and attempting to ameliorate the disproportionate impact of the COVID-19
458 pandemic on rural people with cancer is necessary for all clinicians providing psycho-oncology
459 care. Strategic screening for distress as uniquely evidenced by rural people with cancer,
460 coupled with clinical training to recognise distress via remote technologies when help-seeking
461 may not be a characteristic of rural people affected by cancer, are key foundations in this
462 process.

463

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466 families, and we recognise that our health systems and our health providers can do so much more
467 to support you all as we face this pandemic and beyond.

468

469

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Table 1 (on next page)

Key descriptive characteristics of the studies included in the rapid review

1 Table 1

2 Key Descriptive Characteristics of Studies in the Rapid Review

Study	Study type (Quality Level)	Study aims	Country	Location (n)	Measure / disorder / psychosocial factor	Relevant rural related findings and conclusions
Studies on psychosocial factors						
Boakye, Jenkins and Sharma (2020)	Expert opinion (Tier 2)	Opinion on the impact of the effects of the pandemic on head and neck cancer survivors' wellbeing and health	USA	Not reported	Wellbeing	The impact of the pandemic on the continuing care needs of head and neck cancer survivors may be particularly disproportionate for those in rural areas given pre-existing paucity of material, care, and financial resources, as well as reduced help-seeking and mental health professional shortages. Potential solutions, such as telemedicine, may also be disproportionately effective in rural areas with resource
Davis et al (2021)	Mixed Methods (Tier 1)	To explore the impact of COVID-19 on rural cancer survivor access to health services, treatment and supportive care	Australia	Rural = 66 Urban = 0	Social support; health care access; health- related distress; emotional wellbeing (depression, anxiety, major worry); health care impact (testing/review/treatment delays)	59% experienced reduced social support; 46% experienced reduced access to health care providers; 44% experienced impact to supportive service access; 40% experienced increased health-related distress; 35% experienced negative impact on emotional wellbeing; 33% experienced major worry; 20% experienced medical testing or review delays; and 15% experienced delayed treatment. Older rural people experienced more negative impact in relation to access

Ferrara et al (2021)	Cross-sectional (Tier 1)	To assess the perceived quality of life and the psychosocial impact of the various restrictive	Italy	Non-urban = 584 Urban = 185	Quality of life perception	Cancer patients living in non-urban areas demonstrated a more pessimistic perception of quality of life compared to their urban counterparts (OR = 1.40, 95%CI: 1.09-3.10) during the pandemic
Galica (2021)	Mixed Methods (Tier 1)	To explore how older adults recently discharge from cancer care team were coping during COVID-19	Canada	Rural = 11 Urban = 19	Coping	Qualitative data suggested older cancer survivors appreciated the privileges of living in a rural area as insulation against negative impacts of COVID-19. However, for a disabled older rural person supportive care ceased due to the pandemic, impacting coping and
Jacobs and Ellis (2021)	Cross-sectional (Tier 1)	To examine the social connectivity among Medicare beneficiaries	USA	Rural = 12 Urban = 20788	Social Connectedness	Individuals living in urban/metropolitan areas were less likely to feel disconnected (OR = 0.92, CI = 0.88, 0.97) than those living in in rural, less populous locations
Mama, Cardel and Schmitz (2020)	Oral Presentation Abstract (Tier 2)	To explore associations between perceived threat of COVID-19 and psychosocial distress on health-related quality of life	USA	Rural = 90	Quality of life, psychosocial distress	Rural cancer survivors perceived the threat of COVID-19 itself as low, however reported elevated psychosocial distress related to COVID-19, negatively impacting their mental but not physical health.

Daniels et al (2021)	Oral Presentation Abstract (Tier 2)	To characterise the pandemic's influence on social and health behaviours of rural and urban cancer patients	USA	Rural = 332 Urban = 994	Health behaviours	Urban and rural groups were not significantly different in their experiences of social interaction or feelings of loneliness. Urban patients felt they were at greater risk of contracting COVID-19 (22% vs, 14%; $p < 0.001$), and to more frequently feel their daily lives and exercise habits had been changed (86% vs 77%; $p < 0.001$).
Singh et al (2020)	Mixed Methods (Tier 1)	To assess the health, psychosocial, and economic impacts of the pandemic on people with chronic conditions, including cancer	India	Rural = 401 Urban = 409	Psychosocial and economic	Rural participants were disproportionately experiencing acute medical illnesses, difficulties accessing healthcare and medicine, less access to functioning health facilities, poorer treatment satisfaction, loss of employment/income and poorer nutrition than their urban counterparts.
Singh, Rai and Ishan (2021)	Cross-sectional (Tier 1)	To study the impact of COVID-19 lockdowns on utilisation of health-care services	India	Rural = 125 Urban = 86	Health service access	Rural participants had more difficulties accessing medicines than their rural counterparts (OR = 4.01, CI = 2.90, 5.53). Rural participants were twice as likely as their urban counterparts to miss their follow-up appointments due to difficulties visiting the hospital

Zomerdijk et al (2021)	Cross-sectional (Tier 1)	To identify the psychological impacts of COVID-19 on haematology patients and inform development of supportive interventions	Australia	Rural = 196 Urban = 198	Wellbeing; psychological distress; unmet supportive care needs; fear of cancer reoccurrence	Living in a rural area was associated with greater psychological distress during the pandemic (B -1.29 [-2.53, -0.05], $p = 0.041$). Unwanted variation in care for rural patients was likely heightened during the pandemic due to travel restrictions / barriers to accessing care
Studies on telehealth						
Brunelli, Fox and Langbecker (2021)	Mixed-Methods (Tier 1)	To investigate the preparedness of cancer nurses to deliver survivorship care via telehealth	Australia	Rural setting = 32 Metropolitan = 47	Telehealth	Nursing staff identified improvements in equity of access by reducing travel for patients and clinicians, allowing timely and more easily integrated connection between patients and clinicians, and incorporation of interventions. Telehealth can enhance quality of life, increase convenience, reduce burden, improve independence, and increase access to multidisciplinary metropolitan-based oncology. Despite positive nurse attitudes to use, uptake and use of telehealth remains low in all locations. Hence rural equity gap remains. Telehealth was less likely to be used by rural cancer patients (45.3%) than urban (53.7%, $p < .0001^{**}$). Findings underscore disparities in telehealth use across historically underserved populations.
Jewett et al (2021)	Retrospective (Tier 1)	Examined telehealth use across patient populations with established disparities in treatment and outcomes	USA	Rural = 1253 Urban = 9844	Telehealth	

Keefe et al (2020)	Expert opinion (Tier 2)	To provide a basis for preparing for, and implementing, optimal management of cancer during the pandemic	Australia	Not reported	Telehealth	As a result of telehealth utilisation access to care may have improved for rural patients.
Patt et al (2021)	Cross-sectional (Tier 1)	To characterise multi-stakeholder implementation, utilisation, and feedback of telemedicine	USA	Not reported	Cancer care uptake via telemedicine platforms	Implementation of telemedicine was limited by broadband access in rural communities. Recommendation for improved broadband access for rural areas as a policy priority.
Rariy et al (2021)	Cross-sectional (Tier 1)	To describe a collaborative telehealth partnership model	USA	Not reported	Telehealth	Use of this telehealth model for rural patients reduced waiting times, reduced patient travel by 21,705 miles, saved 310 travel hours, saved US\$7380 in travel and accommodation costs. The model utilises local hospitals for telehealth visits to ensure adequate broadband and technology capabilities.