


# Primary care consumers' experiences and opinions of a telehealth consultation delivered via video during the COVID-19 pandemic

Jo-Anne Manski-Nankervis<sup>A,B,\*</sup> , Sandra Davidson<sup>A</sup>, Harriet Hiscock<sup>C,D,E</sup>, Christine Hallinan<sup>A</sup>, Jemimah Ride<sup>F</sup>, Vignesh Lingam<sup>G</sup>, Jessica Holman<sup>H</sup>, Andrew Baird<sup>A</sup>, Emma McKeown<sup>A,H</sup> and Lena Sancic<sup>A</sup>

For full list of author affiliations and declarations see end of paper

## \*Correspondence to:

Jo-Anne Manski-Nankervis  
Department of General Practice, Faculty of  
Medicine, Dentistry and Health Sciences,  
The University of Melbourne, Vic. 3010,  
Australia  
Email: [jomn@unimelb.edu.au](mailto:jomn@unimelb.edu.au)

## ABSTRACT

This study examined consumers' experiences and opinions of a videoconference with a primary healthcare professional, and estimated the value of travel and time savings for consumers compared with face-to-face consultations. The online survey was conducted in Melbourne, Australia, between October 2020 and May 2021. The sample ( $n = 499$ ) was highly educated (Bachelor degree or higher, 79%; 393/499), predominately female (70%; 347/499), mainly spoke English at home (78%; 390/499) and had a mean age of 31.8 years (s.d. 11.40). Reduced travel time (27%; 271/499) and avoiding exposure to COVID-19 (23%; 228/499) were the main reasons consumers chose a videoconference. Mental health and behavioural issues were the main reason for the consultation (38%; 241/499) and 69% (346/499) of consultations were with a general practitioner. Perceptions of the quality of care were uniformly high, with 84% (419/499) of respondents believing videoconference was equivalent to a face-to-face consultation. No association was found between reporting that telehealth was equivalent to a face-to-face consultation and education, language, health status, reason for consultation or provider type. The average time saved per consultation was 1 h and 39 min, and the average transport-related saving was A\$14.29. High rates of acceptance and substantial cost savings observed in this study warrant further investigation to inform the longer-term role of videoconferences, and telehealth more broadly, in the Australian primary care system.

**Keywords:** allied health, cost analysis, COVID-19, general practice, health services research, survey, telemedicine, videoconference.

## Introduction

One of the many impacts of the Coronavirus disease 2019 (COVID-19) pandemic on health systems around the world has been an unprecedented increase in the use of telehealth. Telehealth, which involves the use of information and communications technology (e.g. telephone, email, videoconferencing) to provide patient care when clients and healthcare providers (HCPs) are physically separated, was rapidly adopted during the pandemic as a way of providing healthcare services while adhering to stay-at-home orders, and reducing the risk of exposure to the virus for both patients and HCPs.

Prior to the pandemic arriving in Australia, reimbursement through the Medicare Benefits Schedule (MBS) for primary care services delivered via telehealth was limited to patients who lived in rural or regional areas, lived at least 15 km from a general practitioner (GP) or other medical practitioner and had received at least three face-to-face attendances in the preceding 12 months. Under this model, telehealth consultations accounted for a negligible proportion of all general practice consultations (Snoswell *et al.* 2020). Since March 2020, the Australian Government has implemented a series of changes to the MBS, which removed the original restrictions and enabled HCPs to receive payment for a selection of services they provide using telehealth (Australian Government

Received: 8 August 2021

Accepted: 22 December 2021

Published: 15 March 2022

## Cite this:

Manski-Nankervis J *et al.* (2022)  
*Australian Journal of Primary Health*  
28(3), 224–231. doi:[10.1071/PY21193](https://doi.org/10.1071/PY21193)

© 2022 The Author(s) (or their  
employer(s)). Published by  
CSIRO Publishing on behalf of  
La Trobe University.

This is an open access article distributed  
under the Creative Commons Attribution  
4.0 International License (CC BY).

OPEN ACCESS

Department of Health 2020). An analysis conducted by Snoswell *et al.* (2020) of MBS data for general practitioner (GP) activity in the months of March, April and May 2019 compared with the same time period in 2020 found that the proportion of consultations conducted by telephone and videoconferences rose from 0% to 34% and 0% to 1% respectively. These figures illustrate the unexpected natural experiment in health service delivery brought about by the COVID-19 pandemic and raise questions about the degree to which pre-COVID-19 studies of telehealth, which are characterised by selective sampling and optimistic conclusions (Orlando *et al.* 2019), reflect the experiences of consumers and HCPs who engaged with telephone and videoconference consultations during the pandemic due to a lack of an alternative, at least for non-urgent care.

Overall, the consensus is that telehealth, including videoconferencing, was underused prior to the pandemic, and that it should be a more prominent part of the healthcare system post-pandemic (World Health Organization 2021). However, determining exactly how telehealth should be integrated into an accessible and effective healthcare system relies on a better understanding of who telehealth works for, and who it does not (Duckett 2020). Without this understanding, indiscriminate use of videoconferencing (and telehealth more broadly) has the potential to inadvertently exacerbate inequalities among people with poor health literacy, low technological literacy and/or insufficient access to technology (Davidson *et al.* 2022). The aim of this study was to examine the experiences and preferences of consumers who attended a primary care telehealth consultation via videoconference in Melbourne during late 2020 and early 2021, and to estimate the savings for consumers in attending a videoconference appointment rather than a face-to-face appointment.

## Methods

### Design, setting and recruitment

We conducted an online survey of consumers who completed a videoconference with a HCP at any one of eight participating primary care clinics between October 2020 and May 2021. Primary care clinics who used the Healthdirect video call platform (Healthdirect Australia 2021) for telehealth consultations were recruited into the study through the North West Melbourne Primary Health Network and the South East Melbourne Primary Health Network using advertisements in their respective newsletters, and through direct approach. All consumers who completed a videoconference at a participating clinic during the study period were eligible to participate in the online survey. At the end of their consultation, consumers were sent a link inviting them to complete an anonymous, 15-min survey. At the completion of the research, participating

clinics were provided with a brief report describing the aggregated survey results. Clinics with more than 10 participants were also provided with de-identified results for their practice. The study was approved by the Human Research Ethics Committee at the University of Melbourne (ID: 2057787).

### Survey

The online survey (Supplement 1) was adapted from a survey developed by Hiscock *et al.* (2021), and included 33 items covering a range of issues including consumer demographics, characteristics of the consultation, acceptability of the consultation and potential cost savings associated with a videoconference appointment compared with a face-to-face appointment. Questions on acceptability were adapted from the Telehealth Usability Questionnaire (Parmanto *et al.* 2016) and the Agency for Clinical Innovation Patient Evaluation Survey (Agency for Clinical Innovation 2015).

### Statistical methods

Survey data were collected using REDCap (Harris *et al.* 2009) and analysed in Stata (version 16.0; College Station, TX, USA). Data are described using frequencies and percentages and, where appropriate, measures of central distribution (e.g. mean, s.d.). Simple logistic regression was performed to estimate whether reporting that videoconference was as good as a face-to-face consultation was associated with: self-rated health, education, language spoken at home, HCP seen or the reason for the consultation. For the logistic regression equations, the independent variables were dichotomised as follows: self-rated health = 'good/very good/excellent' versus 'fair/poor'; education = 'Bachelor/postgraduate qualification' versus 'secondary school or less/trade or other qualification'; language = 'English' versus 'all other languages'; HCP = 'GP' versus 'Other'; reason for consultation = 'mental health' versus 'all other reasons'.

The value of savings for a videoconference appointment compared with a face-to-face appointment was estimated for time and transportation costs. Estimates of the economic value of time savings were based on respondents' self-report of the amount of time saved and whether they spent that time in a paid or unpaid role. In the analysis, participants who said they saved more than a day were attributed a 12-h saving; those who said they saved less than an hour were attributed a 30-min saving; those who said they did not save time were attributed 0 saving. Missing values were attributed the median time saved. Paid roles were attributed the average Victorian weekly wage in November 2020 (\$1592.30 per week for women; \$1794.20 per week for men; Australian Bureau of Statistics 2020) and the unpaid roles were attributed the 2020 Australian minimum wage (\$19.84 per hour; Fair Work Ombudsman 2021;

Verbooy *et al.* 2018). Transport costs were estimated based on self-reported mode of travel to the primary care clinic (i.e. personal car or public transport). For those who usually travelled in a personal car, the distance from their residence to the clinic was taken from a self-reported question about the number of kilometres travelled to the clinic, and mileage was estimated using the Australian Taxation Office rate of \$0.72 per km (Australian Taxation Office 2020). For people travelling via public transport, daily rates for Melbourne public Transport Zones 1 and 2 were applied (\$9.00 per day). The cost of parking and taxi (or equivalent) fares were based on self-report. Total costs were estimated as the sum of time costs and travel costs per person. Total costs were calculated with and without the inclusion of unpaid time. Socioeconomic status of the participant's area of residence was taken from the 2016 SocioEconomic Index For Areas (SEIFA) Index of Relative Socio-economic Advantage and Disadvantage (Australian Bureau of Statistics 2016) based on their postcode.

## Ethics approval

The study was approved by the Human Research Ethics Committee at the University of Melbourne (ID: 2057787).

## Results

### Respondents

A total of 5096 consumers were sent the link to the survey at the completion of their videoconference consultation. Of these, 657 consumers clicked on the link and 499 completed the survey. The response rate was 9.8%. The age range of consumers ranged from less than a month old to 66 years, with a mean of 31.8 years (s.d. 11.40; range 0–66 years).

Almost 70% (347/499) of consumers were female, and 78% (390/499) of all respondents spoke English as the main language at home (Table 1). The sample was highly educated, with 31% (155/499) reporting they had a Bachelor Degree and 48% (238/499) reporting they had a postgraduate qualification. Just under one-fifth (19%; 97/499) considered their health to be fair or poor.

### Characteristics of the consultation

Only 4% (28/499) of respondents reported that their recent videoconference consultation was the first time they had attended that particular clinic and 18% (90/499) reported that it was the first time they had seen that particular HCP (Table 2). Forty-two percent (286/499) said they had attended a telehealth appointment at the clinic within the last 12 months. The most common reason for attending the consultation via videoconference rather than face-to-face was a reduction in travel time and costs (27%; 271/499), and to reduce the risk of being exposed to COVID-19 (23%;

**Table 1.** Demographic characteristics of sample (*n* = 499).

| Characteristic                             | <i>n</i>                     | %        |                       |          |
|--|------------------------------|----------|-----------------------|----------|
| Sex  |                              |          |                       |          |
| Male                                       | 123                          | 24.7     |                       |          |
| Female                                     | 347                          | 69.5     |                       |          |
| Other                                      | 16                           | 3.2      |                       |          |
| Prefer not to say/missing                  | 4                            | 0.8      |                       |          |
| Main language spoken at home               |                              |          |                       |          |
| English                                    | 390                          | 78.2     |                       |          |
| Other                                      | 84                           | 16.8     |                       |          |
| Prefer not to say/missing                  | 25                           | 5.0      |                       |          |
| Education level                            |                              |          |                       |          |
| Secondary school or less                   | 61                           | 12.2     |                       |          |
| Trade or other certificate                 | 31                           | 6.2      |                       |          |
| Bachelor degree                            | 155                          | 31.1     |                       |          |
| Postgraduate qualification                 | 238                          | 47.7     |                       |          |
| Prefer not to say/missing                  | 14                           | 2.8      |                       |          |
| Self-reported health                       |                              |          |                       |          |
| Good/very good/excellent                   | 391                          | 78.4     |                       |          |
| Fair/poor                                  | 97                           | 19.4     |                       |          |
| Prefer not to say/missing                  | 11                           | 2.2      |                       |          |
| <b>SEIFA Quintiles – IRSAD<sup>A</sup></b> | <b>Unpaid role/paid role</b> |          | <b>Paid role</b>      |          |
|  | <b><i>n</i> = 353</b>        | <b>%</b> | <b><i>n</i> = 148</b> | <b>%</b> |
| 1  | 12                           | 3.40     | 7                     | 4.73     |
| 2  | 10                           | 2.83     | 4                     | 2.70     |
| 3  | 35                           | 9.92     | 14                    | 10.14    |
| 4  | 103                          | 29.18    | 34                    | 22.97    |
| 5  | 193                          | 54.67    | 88                    | 59.46    |
| <b>ABS ASGS<sup>A</sup></b>                | <b>Paid role/unpaid role</b> |          | <b>Paid role</b>      |          |
|  | <b><i>n</i> = 353</b>        | <b>%</b> | <b><i>n</i> = 148</b> | <b>%</b> |
| Major city                                 | 326                          | 92.35    | 135                   | 91.22    |
| Inner or outer regional                    | 27                           | 7.65     | 13                    | 6.78     |

<sup>A</sup>Note: *n* = 354 with postcode data. ASGS, Australian Statistical Geography Standard; IRSAD, Index of Relative Socioeconomic Advantage and Disadvantage.

228/499). A total of 13% (131/499) of respondents said that the decision to use telehealth was made by the clinic. Respondents were able to nominate multiple reasons for making an appointment with a HCP. The most common reason for attending the appointment was behavioural/mental health concerns (38%; 241/499), followed by an unspecified medical condition (27%; 173/499). The majority (69%; 346/499) of consultations were with GPs. A total of 93% (464/499) of respondents reported that the entire

**Table 2.** Characteristics of the telehealth consultation (n = 499).

|  | n   | %    |
|--|-----|------|
| Reason for consultation  |     |      |
| Cancer   | 2   | 0.3  |
| Developmental concern  | 2   | 0.3  |
| Alcohol and drug support   | 4   | 0.6  |
| Surgical concern (e.g. review after surgery, referral, skin check) | 9   | 1.4  |
| Work-related assessment/checkup                                    | 9   | 1.4  |
| Muscle, bone or joint injury                                       | 11  | 1.7  |
| Accident or injury   | 20  | 3.1  |
| Medical certificate  | 22  | 3.4  |
| Preventive health (e.g. immunisation, cancer screening, checkup)   | 51  | 8.0  |
| Repeat prescription  | 53  | 8.3  |
| Medical condition (e.g. asthma, diabetes, ear infection, epilepsy) | 173 | 27.2 |
| Behavioural/mental health concern (e.g. anxiety, ADHD, dementia)   | 241 | 37.9 |
| Other  | 20  | 3.1  |
| Prefer not to say/missing  | 19  | 3.0  |
| Reason for attending via telehealth (multiple responses possible)  |     |      |
| Reduced travel time and cost                                       | 271 | 27.4 |
| Reduced risk of contact with COVID-19                              | 228 | 23.0 |
| Satisfied with a previous telehealth experience                    | 176 | 17.8 |
| I didn't choose, a telehealth appointment was made for me          | 131 | 13.2 |
| Difficulty with travel (e.g. due to illness or limited mobility)   | 76  | 7.7  |
| Reduced burden on family members, friends or carers                | 36  | 3.6  |
| Curiosity – I wanted to see how it works                           | 31  | 3.1  |
| Other/prefer not to say  | 41  | 4.1  |
| Type of healthcare provider  |     |      |
| General practice   | 346 | 69.3 |
| Allied health provider   | 137 | 27.5 |
| Mental health professional   | 12  | 2.4  |
| Other  | 4   | 0.8  |
| Had attended this clinic previously (multiple responses possible)  |     |      |
| Yes, I am new to this clinic                                       | 28  | 4.1  |
| No, I have attended over 12 months ago                             | 128 | 18.9 |
| No, I have attended via telehealth within the last 12 months       | 286 | 42.3 |
| No, I have attended in-person within the last 12 months            | 234 | 34.6 |

(Continued on next column)

**Table 2.** (Continued)

|                              | n   | %    |
|------------------------------|-----|------|
| Had seen HCP previously      |     |      |
| Had seen this HCP before     | 395 | 79.2 |
| Had not seen this HCP before | 90  | 18.0 |
| Unsure/missing               | 14  | 2.8  |

consultation was completed using videoconferencing, whereas 3.6% (18/499) reported that the consultation was converted to telephone during the consultation due to technical problems with the video; data was missing for 3.4%.

### Acceptability

Only 2% (10/499) of respondents disagreed with the statement that joining the videoconference consultation was easy, and even fewer (1%; 5/499) indicated that they were not comfortable using videoconference technology (Table 3). Nearly all respondents agreed that telehealth is an acceptable way to receive healthcare services (94%; 469/499) and that it improves access to care (94%; 470/499).

Perceptions of the quality of care received in the videoconference consultation were uniformly high (Table 3). A total of 94% (469/499) of respondents agreed that they had the opportunity to ask questions about their care, 97% (483/499) agreed that their concerns were adequately addressed, and 97% (483/499) felt that their privacy and confidentiality was maintained throughout the consultation. Nevertheless, 11% (57/499) of the sample did not believe that videoconference was as good as a face-to-face consultation.

### Logistic regression analysis

As shown in Table 4, the logistic regression analysis found no association between the belief that telehealth was as good as a face-to-face consultation and self-rated health, education, language spoken at home, HCP seen or the reason for the consultation.

### Cost analysis

A total of 96% (474/499) of respondents reported that they saved time by attending their recent consultation by videoconference rather than face-to-face, with 60% (302/477) estimating that had saved 1–2 h (Table 5) and a mean time saved of 1 h and 39 min. A total of 41% (204/499) of respondents said that they spent the time they saved in an unpaid role (i.e. unpaid work or education) and 38% (190/499) said they spent it in a paid role. The average financial value of time savings was \$47.07 per consultation, including the value of unpaid time, and \$28.01 per consultation if only paid time was included (Table 6). The mean saving related to travel costs was \$14.29 (s.d. 45.31), which

**Table 3.** Acceptability of the telehealth consultation ( $n = 499$ ).

|   | <i>n</i> | %     |
|---|----------|-------|
| Joining the telehealth consultation was easy                              |          |       |
| Agree/strongly agree  | 478      | 95.8  |
| Disagree  | 10       | 2.00  |
| Prefer not to answer/missing  | 11       | 2.20  |
| I was comfortable using the telehealth technology                         |          |       |
| Agree/strongly agree  | 485      | 97.20 |
| Disagree  | 5        | 1.00  |
| Missing   | 9        | 1.80  |
| Telehealth was convenient   |          |       |
| Agree/strongly agree  | 481      | 96.4  |
| Disagree  | 7        | 1.40  |
| Prefer not to answer/missing  | 11       | 2.20  |
| Telehealth is an acceptable way to receive healthcare services            |          |       |
| Agree/strongly agree  | 469      | 94.0  |
| Disagree/strongly disagree  | 14       | 2.80  |
| Prefer not to answer/missing  | 16       | 3.21  |
| Telehealth improves access to healthcare services                         |          |       |
| Agree/strongly agree  | 470      | 94.2  |
| Disagree  | 9        | 1.80  |
| Prefer not to answer/missing  | 20       | 4.1   |
| The telehealth service gave me the opportunity to ask about my care       |          |       |
| Agree/strongly agree  | 469      | 94.0  |
| Disagree  | 7        | 1.40  |
| Prefer not to answer/missing  | 23       | 4.61  |
| My health concerns were adequately addressed                              |          |       |
| Agree/strongly agree  | 483      | 96.8  |
| Disagree/strongly disagree  | 5        | 1.0   |
| Prefer not to answer/missing  | 11       | 2.2   |
| My safety and privacy was maintained in the consultation                  |          |       |
| Agree/strongly agree  | 483      | 96.8  |
| Disagree  | 3        | 0.6   |
| Prefer not to answer/missing  | 13       | 2.6   |
| The telehealth service I received was as good as an in-person appointment |          |       |
| Agree/strongly agree  | 419      | 84.0  |
| Disagree  | 57       | 11.4  |
| Prefer not to answer/missing  | 23       | 2.81  |

was highest for those who travelled by car or motorcycle (\$27.29; s.d. 74.95). Overall, the mean total savings (paid and unpaid time plus travel) were valued at \$61.36, or for paid time plus travel at \$42.30 (Table 6). Among those who

provided postcode information ( $n = 353$ ), the mean total savings were \$67.78, ranging from \$56.02 among those in metropolitan areas to \$209.73 among those in regional areas. Those with SEIFA scores below the national average had higher total estimated cost savings from telehealth consultation on average (\$124.60; 95% CI \$72.85–176.35) compared with those above the national SEIFA average (\$57.06; 95% CI \$48.99–65.14). Higher estimated cost savings were also observed for those with a SEIFA score below the national average if time costs were limited to paid time, as shown in Table 6. There were no significant differences in travel costs across metropolitan and regional areas, nor between those with SEIFA scores below or above the average.

## Discussion

This study found that highly educated primary care consumers overwhelmingly believe that videoconference is as good as a face-to-face consultation, and many prefer it because of convenience and cost benefits. Avoiding potential exposure to COVID-19 was also a key driver for choosing to attend the consultation by videoconference rather than in-person. Cost analysis found considerable consumer-related cost savings associated with videoconference, especially for consumers who lived in regional areas.

Surprisingly, we found no between-group differences related to the belief that videoconference is as good as a face-to-face consultation. Based on a long history of telehealth being used effectively to assess and manage mental health issues (Hilty *et al.* 2013), and recent literature indicating that telehealth is less acceptable to consumers and clinicians when a physical examination is required (Imlach *et al.* 2020; Davidson *et al.* 2022), we expected that consumers attending for mental health reasons would rate videoconference more highly. However, we found no differences between ratings for acceptability of telehealth for mental health and other health issues. It is likely that our null finding is due to the heterogeneous nature of the 'other' conditions rather than a true reflection of telehealth being equally acceptable for all conditions.

The lack of association between speaking English at home and believing telehealth is equivalent to a face-to-face consultation is also in contrast to previous studies that have found that consumers who are not proficient in the primary language of the health service are less likely to prefer telehealth (Hiscock *et al.* 2021), and are more likely to need to have the consultation re-scheduled as a face-to-face consultation (Jiang *et al.* 2021). It is possible that our highly educated sample was very proficient in English, despite it being a second language for 18%. Our findings are consistent, however, with previous studies showing a very high rate of acceptance among primary care consumers for telehealth consultations conducted using video (Powell *et al.* 2017; Imlach *et al.* 2020; Isautier *et al.* 2020).



**Table 4.** Association between consumer and consultation characteristics and perceptions of telehealth via video.

|                           | Total | Equivalent to face-to-face |        | Not equivalent to face-to-face |        | OR    | 95% CI      | P-value |
|---------------------------|-------|----------------------------|--------|--------------------------------|--------|-------|-------------|---------|
|                           |       | <i>n</i>                   | (%)    | <i>n</i>                       | (%)    |       |             |         |
| Self-rated health         |       |                            |        |                                |        |       |             |         |
| Good to excellent         | 381   | 332                        | (87.1) | 49                             | (12.9) | 0.637 | 0.291–1.397 | 0.261   |
| Fair to poor              | 93    | 85                         | (91.4) | 8                              | (8.6)  |       |             |         |
| Primary language          |       |                            |        |                                |        |       |             |         |
| English                   | 383   | 342                        | (89.3) | 41                             | (10.7) | 1.668 | 0.846–3.286 | 0.139   |
| Other                     | 78    | 65                         | (83.3) | 13                             | (16.7) |       |             |         |
| Education                 |       |                            |        |                                |        |       |             |         |
| Bachelor degree or higher | 365   | 317                        | (86.8) | 48                             | (13.2) | 0.393 | 0.151–1.018 | 0.055   |
| Other                     | 89    | 84                         | (94.4) | 5                              | (5.6)  |       |             |         |
| Reason for visit          |       |                            |        |                                |        |       |             |         |
| Mental health             | 241   | 202                        | (83.8) | 39                             | (16.2) | 0.978 | 0.606–1.579 | 0.929   |
| Other                     | 258   | 217                        | (84.1) | 41                             | (15.9) |       |             |         |
| Healthcare provider       |       |                            |        |                                |        |       |             |         |
| General practitioner      | 346   | 295                        | (85.3) | 51                             | (14.7) | 0.564 | 0.691–1.966 | 0.564   |
| Other                     | 149   | 124                        | (83.2) | 25                             | (16.8) |       |             |         |

Including only consultations that were conducted using videoconferencing was both a limitation and a strength of this study. It was a limitation because telehealth using videoconferencing is relatively rare in Australian primary care (Snoswell *et al.* 2020) and, therefore, findings from this study cannot be generalised to telephone consultations. However, focusing on videoconferencing may also be a strength, as current reimbursement for telehealth consultation through the MBS favours videoconferencing over telephone consults in a way that may see videoconferencing increase in the future. Another limitation of the study is the very high level of education, and relatively young age, of respondents, which is a reflection of recruitment sites being concentrated near one of Victoria's major universities. The low response rate is also a weakness of the study. Therefore, the results cannot be generalised to children, adolescents or the elderly and to the broader Victorian or Australian population. However, it should be noted that in terms of age and sex, the sample reflected Medicare data, which shows that the consumers of GP videoconferences from April 2020 to March 2021 were mainly female (62.3%) and the median age was 30–39 years (Medicare Australia 2021). We also do not know if consumers who did not complete the survey had similarly positive experiences of their videoconference consultation. It is possible that consumers who found connecting to the videoconference difficult or had poor quality of video or audio were less likely to go on to complete an online survey.

It should also be noted that using income to estimate the value of time may lead to an overestimate of the cost savings

attributed to videoconference consultations. These results estimate the value of time saved, without suggesting that individuals would actually save this amount of money, as many people would be able to attend healthcare during paid hours by taking paid leave. Time and travel cost savings are likely to be perceived differently by patients, with travel reductions perceived as savings, whereas time savings may not be overt to the individual. However, both are relevant when considering the value of videoconferences in terms of welfare gained (i.e. the time saved has value at a societal level).

## Implications

Videoconferencing is an acceptable way to deliver primary care services and may be preferable for some consumers at least some of the time. The value of time and travel costs saved do not suggest that people could be charged up to \$60 out of pocket extra for a telehealth consultation and still be better off overall, as this does not take into account the perceived value of in-person versus videoconference consultations, nor people's ability to use paid leave to attend healthcare. Actual willingness to pay for videoconference consultations may therefore be quite different to this estimate. If people only perceive savings to be just those related to travel, and they perceive that videoconference consultations provide equivalent quality of care to a face-to-face consultation, then the willingness to pay for videoconference consultations may be closer to \$14.

**Table 5.** Time and costs associated with attending a consultation ( $n = 495$ ).

|  | <i>n</i> | %     |
|--|----------|-------|
| The telehealth appointment saved me time                                 |          |       |
| Agree or strongly agree  | 474      | 95.75 |
| Disagree or strongly disagree  | 17       | 3.43  |
| Prefer not to answer   | 4        | 0.81  |
| What is the estimated time you have saved by attending via telehealth?   |          |       |
| Less than 1 h  | 121      | 24.44 |
| 1 h  | 159      | 32.12 |
| 2 h  | 143      | 28.89 |
| Half a day (4 h)   | 31       | 6.26  |
| A whole day (8 h)  | 5        | 1.01  |
| More than 1 day  | 11       | 2.22  |
| Prefer not to answer   | 8        | 1.62  |
| Disagree (0 hours saved)   | 17       | 3.43  |
| Missing  | 21       | 4.24  |
| How would you have normally spent this time?                             |          |       |
| In a paid role or job  | 190      | 38.38 |
| In an unpaid role or job, or in education                                | 204      | 41.21 |
| Prefer not to answer   | 80       | 16.16 |
| Missing  | 21       | 4.24  |
| How would you usually travel to the clinic for an in-person appointment? |          |       |
| Public transport   | 206      | 41.62 |
| Personal car or motorcycle   | 173      | 34.95 |
| Walk or bicycle  | 82       | 16.56 |
| Taxi/Uber or equivalent  | 11       | 2.22  |
| Prefer not to answer/unsure/other  | 23       | 4.65  |

When estimates of the overall financial and time savings were combined, consumers in more disadvantaged areas saved more than consumers in the least disadvantaged areas, and consumers living in regional areas saved more than consumers living in urban areas.

## Conclusion

High rates of acceptance and substantial consumer cost savings were observed in this study, which was based primarily on samples of well educated, young adult to middle-aged consumers who speak English as their first language. Future research should concentrate on understanding the perspectives of other groups to ensure that embedding videoconference consultations more firmly in the system does not inadvertently increase inequalities in accessing quality primary health care.

**Table 6.** Estimated savings from telehealth consultation per person ( $n = 495$ ,  $n = 353$  with SEIFA and rurality based on postcode).

|                                       | <i>N</i> | Total cost (A\$; paid + unpaid time + travel)<br>Mean (95% CI) | Total cost (A\$; paid time + travel)<br>Mean (95% CI) | Time cost (A\$; paid + unpaid)<br>Mean (95% CI) | Time cost (A\$; paid)<br>Mean (95% CI) | Travel cost (A\$)<br>Mean (95% CI) |
|---------------------------------------|----------|--|---|---|--|------------------------------------|
| Overall                               | 495      | 61.36 (53.24, 69.48)   | 42.30 (34.23, 50.37)                                  | 47.07 (41.86, 52.46)                            | 28.01 (22.64, 33.37)                   | 14.29 (10.28, 18.29)               |
| Linked to SEIFA and rurality data     | 353      | 67.78 (56.98, 78.58)   | 47.74 (36.99, 58.50)                                  | 51.87 (45.08, 58.65)                            | 31.83 (25.07, 38.59)                   | 15.91 (10.33, 21.49)               |
| SEIFA score                           |          |  |   |   |  |                                    |
| Below national average (< 1000)       | 56       | 124.60 (72.85, 176.35)   | 99.98 (46.59, 153.36)                                 | 90.10 (59.93, 120.27)                           | 65.48 (33.33, 97.63)                   | 34.50 (4.55, 64.44)                |
| Above national average ( $\geq$ 1000) | 297      | 57.06 (48.99, 65.14)   | 37.89 (30.19, 45.60)                                  | 44.66 (39.18, 50.14)                            | 25.48 (20.34, 30.63)                   | 12.41 (8.83, 15.98)                |
| Rurality                              |          |  |   |   |  |                                    |
| Major city                            | 326      | 56.02 (48.66, 63.38)   | 38.34 (30.91, 45.77)                                  | 44.42 (39.28, 49.56)                            | 26.74 (21.49, 31.99)                   | 11.60 (8.44, 14.77)                |
| Inner or outer regional               | 27       | 209.73 (109.33, 310.14)  | 161.23 (56.39, 266.08)                                | 141.80 (86.00, 197.59)                          | 93.30 (33.02, 153.59)                  | 67.93 (5.47, 130.39)               |

## Supplementary material

Supplementary material is available [online](#).

## References

- Agency for Clinical Innovation (2015) Chronic Pain Telehealth Toolkit. Patient Evaluation Survey Questions. Available at [https://aci.health.nsw.gov.au/resources/pain-management/chronic\\_pain/chronic-pain-telehealth-toolkit](https://aci.health.nsw.gov.au/resources/pain-management/chronic_pain/chronic-pain-telehealth-toolkit)
- Australian Bureau of Statistics (2016) 2033.0.55.001 – Census of Population and Housing: Socio-Economic Indexes for Areas (SEIFA), Australia. Available at <https://www.abs.gov.au/ausstats/abs@.nsf/mf/2033.0.55.001>
- Australian Bureau of Statistics (2020) 'Average Weekly Earnings, Australia.' (Australian Bureau of Statistics: Canberra) Available at <https://www.abs.gov.au/statistics/labour/earnings-and-work-hours/average-weekly-earnings-australia/latest-release> [Accessed 19 January 2021]
- Australian Government Department of Health (2020) 'COVID-19 Temporary MBS Telehealth Services.' (MBS Online: Canberra) Available at <http://www.mbsonline.gov.au/internet/mbsonline/publishing.nsf/Content/Factsheet-TempBB>
- Australian Taxation Office (2020) 'Car expenses.' (Australian Taxation Office: Canberra) Available at [https://www.ato.gov.au/individuals/income-and-deductions/deductions-you-can-claim/Transport-and-travel-expenses/car-expenses/?=redirected\\_car](https://www.ato.gov.au/individuals/income-and-deductions/deductions-you-can-claim/Transport-and-travel-expenses/car-expenses/?=redirected_car) [Accessed 19 January 2021]
- Davidson SK, Sanci L, de Nicolas Izquierdo C, Watson CJ, Baltag V, Sawyer S (2022) Best practice during teleconsultations with adolescents: a scoping review. *Journal of Adolescent Health*. doi:10.1016/j.jadohealth.2021.11.012
- Duckett S (2020) What should primary care look like after the COVID-19 pandemic? *Australian Journal of Primary Health* 26, 207–211. doi:10.1071/PY20095
- Fair Work Ombudsman (2021) 'Minimum wages.' (Fair Work Ombudsman: Canberra) Available at <https://www.fairwork.gov.au/pay/minimum-wages> [Accessed 19 January 2021]
- Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG (2009) Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *Journal of Biomedical Informatics* 42(2), 377–381. doi:10.1016/j.jbi.2008.08.010
- Healthdirect Australia (2021) 'Healthdirect Australia.' (Healthdirect Australia: Sydney) Available at <https://about.healthdirect.gov.au/> [Accessed 19 January 2021]
- Hilty DM, Ferrer DC, Parish MB, Johnston B, Callahan EJ, Yellowlees PM (2013) The effectiveness of telemental health: a 2013 review. *Telemedicine Journal & E-Health* 19(6), 444–454. doi:10.1089/tmj.2013.0075
- Hiscock H, Pelly R, Hua X, West S, Tucker D, Raymundo CM, Dalziel K (2021) A survey of paediatric telehealth benefits from the caregiver perspective. *Australian Health Review*. doi:10.1071/AH21036
- Imlach F, McKinlay E, Middleton L, Kennedy J, Pledger M, Russell L, Churchward M, Cumming J, McBride-Henry K (2020) Telehealth consultations in general practice during a pandemic lockdown: survey and interviews on patient experiences and preferences. *BMC Family Practice* 21(1), 269–269. doi:10.1186/s12875-020-01336-1
- Isautier JM, Copp T, Ayre J, Cvejic E, Meyerowitz-Katz G, Batcup C, Bonner C, Dodd R, Nickel B, Pickles K, Cornell S, Dakin T, McCaffery KJ (2020) People's experiences and satisfaction with telehealth during the COVID-19 pandemic in Australia: cross-sectional survey study. *Journal of Medical Internet Research* 22(12), e24531. doi:10.2196/24531
- Jiang W, Magit AE, Carvalho D (2021) Equal access to telemedicine during COVID-19 pandemic: A pediatric otolaryngology perspective. *The Laryngoscope* 131, 1175–1179. doi:10.1002/lary.29164
- Medicare Australia (2021) Medicare Item Reports. Available at [http://medicarestatistics.humanservices.gov.au/statistics/mbs\\_item.jsp](http://medicarestatistics.humanservices.gov.au/statistics/mbs_item.jsp) [Accessed 1 May 2021]
- Orlando JF, Beard M, Kumar S (2019) Systematic review of patient and caregivers' satisfaction with telehealth videoconferencing as a mode of service delivery in managing patient' health. *PLoS One* 14, e0221848. doi:10.1371/journal.pone.0221848
- Parmanto B, Lewis AN, Graham KM, Bertolet MH (2016) Development of the telehealth usability questionnaire (TUQ). *International Journal of Telerehabilitation* 8(1), 3.
- Powell RE, Henstenburg JM, Cooper G, Hollander JE, Rising KL (2017) Patient perceptions of telehealth primary care video visits. *The Annals of Family Medicine* 15(3), 225–229. doi:10.1370/afm.2095
- Snoswell CL, Caffery LJ, Haydon HM, Thomas EE, Smith AC (2020) Telehealth uptake in general practice as a result of the coronavirus (COVID-19) pandemic. *Australian Health Review* 44, 737–740. doi:10.1071/AH20183
- Verbooy K, Hoefman R, Van Exel J, Brouwer W (2018) Time is money: investigating the value of leisure time and unpaid work. *Value in Health* 21(12), 1428–1436.
- World Health Organization (2021) 'How to plan and conduct telehealth consultations with children and adolescents, and their families.' (World Health Organization: Geneva)

**Data availability.** The data that support this study may be shared upon reasonable request to the corresponding author and with appropriate ethics approvals in place.

**Conflicts of interest.** The authors declare no conflicts of interest. Primary care practices did have access to the Healthdirect platform via participating primary health networks during the study period.

**Declaration of funding.** This research did not receive any specific funding.

**Acknowledgements.** The authors thank the general practice and allied health clinics in Melbourne who participated in this study, despite the significant impact of COVID-19 on their practices. We also thank the consumers for completing the survey.

### Author affiliations

<sup>A</sup>Department of General Practice, Faculty of Medicine, Dentistry and Health Sciences, The University of Melbourne, Vic. 3010, Australia.

<sup>B</sup>Centre for Digital Transformation of Health, Faculty of Medicine, Dentistry and Health Sciences, The University of Melbourne, Melbourne, Vic. 3010, Australia.

<sup>C</sup>Health Services Research Unit, The Royal Children's Hospital, 50 Flemington Road, Melbourne, Vic. 3052, Australia.

<sup>D</sup>Health Services, Murdoch Children's Research Institute, 50 Flemington Road, Melbourne, Vic. 3052, Australia.

<sup>E</sup>Department of Paediatrics, The University of Melbourne, Melbourne, Vic. 3010, Australia.

<sup>F</sup>Health Economics Unit, School of Population and Global Health, The University of Melbourne, Melbourne, Vic. 3010, Australia.

<sup>G</sup>South Eastern Melbourne Primary Health Network, Heatherton, Vic. 3202, Australia.

<sup>H</sup>North Western Melbourne Primary Health Network, Parkville, Vic. 3052, Australia.