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The demand for private telehealth services in low- and middle-income countries: Evidence from South Africa

Mylene Lagarde [a], Irene Papanicolas [b], Nicholas Stacey [a,*]

[a] Department of Health Policy, London School of Economics and Political Science, United Kingdom
[b] Department of Health Services, Policy, and Practice, School of Public Health, Brown University, United Kingdom

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ABSTRACT

In low- and middle-income countries, many believe that telehealth services could significantly expand access to doctors by offering remote access at low cost. Yet, despite its convenience, telehealth care is limited by the absence of physical examination, point-of-care testing, or immediate treatment. Hence it is unclear how individuals value such options compared to standard face-to-face care. We study this issue in South Africa with general practitioners who today mostly practice in the private sector and are geographically located in wealthier areas with higher health insurance coverage. We use an incentive-compatible method to elicit robust measures of willingness-to-pay (WTP) for telehealth and face-to-face consultations with general practitioners in a sample of uninsured individuals. We find that only 36% of respondents are willing to pay the prevailing market price for a telehealth consultation. We find average WTP for in-person consultations is only 10% higher than that of telehealth. Additionally, individuals with higher health needs are willing to pay a premium for face-to-face consultations, while others are indifferent. Our findings suggest that private telehealth services are better suited for more minor health needs, but are unlikely to expand access to a majority unless cheaper models are introduced.

1. Introduction

Many governments in low- and middle-income countries (LMICs) have committed themselves to ambitious goals for improving population health, including the achieving of universal healthcare coverage (UHC). Yet, in practice, in the short run LMICs will have limited human resources with which to achieve these goals (WHO, 2016; Yan et al., 2023). For example, the number of medical doctors in Europe was 43.2 per 10 000 population in 2020 but only 2.8 per 10 000 population in Africa (WHO, 2021). This challenge is compounded by stark within-country spatial inequalities in the distribution of these doctors (Scheil-Adlung, 2015). In the absence of a rapid expansion of the number of healthcare providers, achieving UHC in many LMIC settings would require finding a way to increase access to the limited number of providers that are currently available.

Telehealth, or telemedicine, broadly refers to the use of information technologies to provide healthcare remotely via audio, video, or text chat (Tuckson et al., 2017). The primary virtue of telehealth is that users do not have to travel to visit a provider, which significantly reduces the monetary and time costs of receiving care, particularly for populations in underserved areas (McCool et al., 2022). However, while telehealth likely reduces the cost of accessing care to users, the type of care that can be provided is more limited. Not being physically present means physical examinations and point-of-care investigations (e.g. urine tests) cannot be undertaken. Hence, diagnosing illnesses may require referring patients for a face-to-face consultation or tests which could ultimately increase costs (Blandford et al., 2020). Moreover, telehealth can also negatively impact non-verbal cue perception and communication between patient and provider, which could lead to worse quality of care or misdiagnoses (Henry et al., 2017; Faucett et al., 2017).

While telehealth has existed in various forms for some time, the COVID pandemic accelerated its adoption. Many private web platforms and applications emerged to offer remote consultations due to movement and social distancing restrictions in place at the time (Barnett et al., 2018; Koonin et al., 2020; Monaghesh and Hajizadeh, 2020; Ali et al., 2020). Advocates have argued that these services can play a role in addressing longer term healthcare access issues in low- and middle-income settings (Akintunde et al., 2021). However, there is limited evidence to support that view and several unanswered questions. In particular, it is unclear how much populations with unmet need are willing to pay for private telehealth care, especially given its limitations. Existing evidence on demand for telehealth care is largely restricted to

* Corresponding author. 6 Portugal St, London, WC2A 2HJ, United Kingdom.
E-mail address: n.k.stacey@lse.ac.uk (N. Stacey).

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high-income settings (Chua et al., 2022). In the few instances where studies have been undertaken , measurement approaches have relied on stated preference methods, which may be subject to hypothetical biases and as such make drawing broader inferences hard (Chang et al., 2017; Suzuki et al., 2019; Arize and Onwujekwe, 2017).

In this paper, we study the demand for private telehealth services and its determinants in South Africa. In this context while medical doctors are concentrated in the private sector, the majority of the population cannot afford private health insurance and must rely on care provided by an overburdened public sector (Mayosi and Benatar, 2014). Several private platforms have emerged in this setting to offer telehealth care as a both more affordable and more convenient means of consulting with general practioners (GPs) (Naidoo, 2021). We use an incentive-compatible method to measure the willingness-to-pay (WTP) for one of those existing telehealth services: a remote consultation with a general practitioner (GP). We do this in a sample of individuals seeking care at the time of the study and without insurance. We first describe the distribution and determinants of WTP for telehealth consultations with a GP in this population. Next, we assess how WTP for telehealth consultations compares to WTP for face-to-face consultations, which we also elicit in the same population. To further understand and interpret our results, we elicit respondents' perceptions of the quality and convenience of the two modes of care.

Our study reveals three main results. First, we find that the WTP for telehealth consultations is below prevailing prices for a large majority of respondents. This result suggests that telehealth is affordable at prevailing prices only to a minority of uninsured South Africans. We also find that WTP for telehealth consultations is lower than for face-to-face consultations, although the premium for in-person services is small, at approximately 10% of the current price of a telehealth consultation. This premium is likely driven by the perceived higher quality of face-to-face consultations, which seems to outweigh the greater convenience of telehealth services. Finally, we show that perceived need for care is strongly correlated with WTP for services.

This paper is structured as follows. Section 2 introduces and describes the institutional context for this study. Section 3 presents a simple conceptual framework. Section 4 describes the methods and data. The results presented in Section 5 describe the WTP distributions we elicit, their correlates, and the difference between the WTP for face-to-face and telehealth care. Section 6 includes our discussion and conclusions.

2. Study setting

Post-apartheid South Africa remains characterised by high levels of persistent poverty and income inequality (World Bank, 2018). During apartheid, healthcare access and supply was organized on the basis of race (Van Rensburg and Benatar, 1993; Price, 1986). While explicit racial restrictions no longer exist, the organization of the current healthcare sector reflects the inequalities of the past (McIntyre and Ataguba, 2017; Coovadia et al., 2009). The wealthiest 15% of the population hold private health insurance (through membership in so-called medical aid schemes), and access generally high-quality care through private facilities and providers (often self-employed general practitioners in the case of primary care) (McIntyre and Ataguba, 2017). Meanwhile, the remaining 85% of the population mostly rely on public hospitals and crowded primary care clinics staffed by nurses, unless they can afford to pay out-of-pocket to use private providers (McIntyre and Ataguba, 2017). Despite the difference in the sizes of population served, healthcare resources are concentrated in the private sector: for the year 2021 there were 14.72 doctors per 10 000 population in the private sector, as compared to only 3.65 doctors per 10 000 population in the public sector (own calculations based on Ndlovu et al. (2021) and HPCSA (2022)).[1]

Inequalities of access to medical doctors in South Africa have a strong geographical dimension. Beyond the traditional disparities across urban and rural areas, there are significant variation within urban areas, as providers tend to be concentrated where medical aid membership is high. The City of Johannesburg provides a good illustration. As depicted in Fig. 1(a), some areas of the city have low rates of medical aid membership while others have very high rates.[2] At the same time, the density of doctors is strongly correlated to the share of the population covered by private insurance, as GPs locate close to their main clientele (see Fig. 1(b)). Thus, there are two dimensions to inequalities in access to doctors. The first arises from the direct financial costs created by consultation fees. The second is driven by the transportation and time costs imposed on those who live far from providers.

There are reasons to believe that telehealth services may provide an opportunity to address the geographical dimension of inequalities in South Africa. In April 2020, the Health Professions Council of South Africa (HPCSA) – the regulator responsible for the conduct of healthcare providers – eased existing regulations prohibiting the provision of "telehealth" care between provider and patient (Barit, 2020).). Since then, several platforms have appeared in the South African market, offering consultations by phone or video, and many have argued that they could reduce imbalance in access to private services (Paruk et al., 2022). In a recent op-ed, the chief executive of one of the largest medical aid schemes argued: *"We need to figure out how we can unlock private healthcare for more people. Some challenges include travel costs, loss of income due to lost productive time, language barriers, gaps in quality of care, or people in rural areas who lack access to the latest technology. However, this is also where the opportunity is and where the solution lies. Technology has the power to democratise private healthcare, making it more widely accessible and affordable"* (Naidoo, 2021). However, whether this opportunity materializes depends partly on the demand for telehealth services among those currently excluded from private care.

3. Conceptual framework

To motivate our analysis, we briefly consider theoretically how individuals might value different healthcare service types.[3] A consultation

[1] This estimate is constructed based on: (i) a measure of the population covered by the private sector defined as those who are medical aid members and (ii) the number of private sector doctors is the number of registered doctors minus the number of doctors working in the public sector. This is an imperfect measure for two reasons. First, the population of private users is underestimated because a small share of uninsured people sometimes pay out-of-pocket to use private doctors. Second, the population of private doctors is over-estimated because it includes individuals who may not practice anymore. Still, it is a measure that provides a rough estimate of the concentration of resources in the private sector, adjusting for the population served.

[2] Ward-level medical aid coverage estimates plotted in Fig. 1(a) are constructed from the Gauteng City Region Observatory's Quality of Life Survey V (GCRO (2022)). To produce Fig. 1 (b), we plot these estimates against data on the number of private practices per ward constructed with information on the location of GP practices from medpages, a comprehensive database covering about 80% of private doctors nationally.

[3] In Appendix 8 we present a formal demand model and derive some hypotheses for factors influencing willingness to pay.

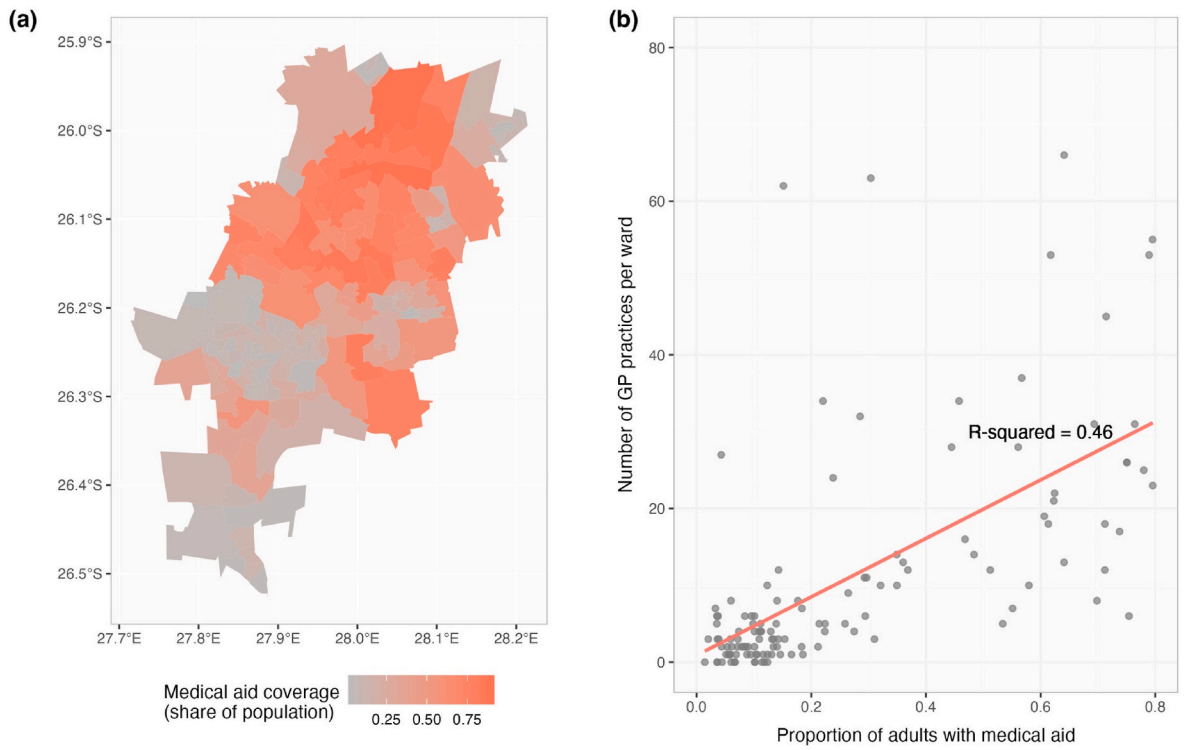

Fig. 1. Spatial distribution of medical aid membership and GP practices.

with a healthcare provider may be thought of as having several attributes. These would include the price, the time it would take to travel and receive the service, and the effectiveness of the service provided in meeting the user's need. Whether or not individuals choose to pay and receive that service would then be determined by whether their perception of the benefits exceeds the perceived cost. The benefits are the improvement in health status caused by the care and its associated quality, and the costs would include the direct cost of the price or fee and the indirect costs of the time taken to receive the service. How severe one's need is perceived to be also likely to influence the benefit of seeking care. Telemedicine consultations offer remote care, which may have some limitations in terms of the investigations the doctor could undertake (as compared to face-to-face care) but come with significantly lower indirect, time costs. However, it is an open question as to whether uninsured South Africans perceive there to be sufficient value in the type of care offered and lower indirect costs to make use of these services at prevailing prices.

4. Methods

4.1. Study design and sample

We collected primary data to study the demand for telehealth services by uninsured individuals because none of the existing data had the necessary information. Between November 2021 and July 2022, we ran Google advertisements targeting individuals actively seeking healthcare services through internet searches.[4] The choice of this recruitment strategy was driven by the nature of the service studied; providers of telehealth services similarly target individuals online given the need for minimal technology skills and connectivity. We excluded insured individuals and obtained a final sample of n = 644 uninsured individuals.

In Table 1, we present key characteristics of the sample. Compared to the general population, respondents are more urban (89%) and more female (70%), reflecting known correlates of the place of recruitment (online) and the targeted behaviour (health-seeking).

Table 1
Sample characteristics.

	(1) Mean	(2) S.D.
Gender:		
Female	0.70	(0.46)
Race/Population group:		
Black African	0.67	(0.47)
Coloured	0.18	(0.38)
Asian/Indian	0.04	(0.19)
White	0.12	(0.32)
Age:		
18–25 years old	0.38	(0.49)
26–35 years old	0.30	(0.46)
36–45 years old	0.16	(0.37)
46–55 years old	0.09	(0.28)
56–65 years old	0.05	(0.23)
66 years old or older	0.02	(0.12)
Education/Employment:		
More than secondary	0.39	(0.49)
Employed	0.43	(0.50)
Urban/rural:		
Rural	0.11	(0.31)
Healthcare need:		
Expected likelihood of needing care	5.71	(3.05)
Any chronic disease	0.49	(0.50)
Observations	644	

Notes: This table presents characteristics of the study sample. Sample recruited from Google advertisements targeting individuals seeking general practitioner care in South Africa between November 2021 and July 2022. Standard deviations are reported in parentheses.

[4] In Appendix 1 we describe the recruitment strategy in greater detail as well as provide a comparison of the study sample characteristics to that of a nationally representative sample.

4.2. Survey structure

The survey includes three main sections. First, we retrieve information about respondents' demographic and socioeconomic characteristics. Questions cover age, gender, race, educational attainment, employment, household income. We also query respondents on their health status and recent healthcare seeking behaviour. Second, we elicit respondents' WTP for face-to-face and telehealth consultations. To control for order effects, we randomize the sequence in which respondents complete the WTP elicitation for the two modes of care. Finally, the survey ends with short clinical vignettes to measure respondents' perceptions of the strengths and weaknesses of face-to-face and telehealth care.

4.3. Measuring willingness-to-pay

4.3.1. Background

The empirical investigation of users' willingness to pay for healthcare products can follow two approaches, each with its own advantages and limitations. The first approach, stated preference, relies on hypothetical choices. Examples include contingent valuation surveys and discrete choice experiments (Özdemir et al., 2009). Contingent valuation studies ask respondents how much they would be willing to pay hypothetically for a good with certain characteristics (Diener, O'Brien, and Gafni, 1998; Steigenberger et al., 2022). In discrete choice experiments, respondents choose between alternative versions of a hypothetical product, each characterised by different attributes. Based on the choices made, the analyst can infer the willingness-to-pay (WTP) for the product and for its attributes (e.g. waiting times, physical examinations in the case of telemedicine GP consultation). The fundamental limitation of stated-preference methods is hypothetical bias, because the responses given by respondents in these surveys do not have not consequences (Harrison and Elisabet Rutström, 2008; Blumenschein et al., 2001; Özdemir et al., 2009; De Corte, Cairns, and Grieve, 2021). Evidence shows that individuals typically overstate their WTP in these surveys (Özdemir et al., 2009; De Corte, Cairns, and Grieve, 2021).

In the second approach, researchers elicit revealed or actual preferences of respondents. These methods have emerged in the experimental and development economics literature to address concerns around hypothetical responses. Revealed preferences approaches such as the Becker-deGroot-Marshak mechanism and the multiple price list (MPL) (Berry et al., 2020; Burchardi et al., 2021; Anderson et al., 2007) include real decisions and incentives to elicit the actual WTP of respondents, free of hypothetical bias. For example, in a MPL survey, individuals choose whether to purchase a good at a given price which increases (or decreases) at regular intervals to cover the range of interest (Andersen et al., 2006; Anderson et al., 2007). One of the respondents' choices is then randomly selected and the choice is actually implemented – i.e. the respondent purchases the good. This approach therefore ensures that individuals have an incentive to state truthfully, for each price, whether they are willing to buy the good or not (Anderson et al., 2007). As an added advantage, the MPL also allows to elicit the entire demand curve for a good.

In this study, we are primarily interested in measuring the WTP of respondents for an emerging type of healthcare service, and study its determinants. Therefore we choose a revealed preference approach to elicit WTP in the most robust way, without concerns of hypothetical bias. To that end, we implement a variant of the MPL approach for an actual telehealth consultation product, as described below.

4.3.2. Vouchers

In this section, we describe the actual product offered for purchase to respondents in the survey. We study two prepaid vouchers that were sold in South Africa by a large and well-known company at the time of the study: one for a telehealth consultation conducted by a GP and one for a face-to-face consultation at a GP's practice. The telehealth consultation voucher was offered on the market at ZAR 290 and the face-to-face consultation voucher at ZAR 360. These vouchers allow users to have a consultation with any GP from the participating network with national coverage, without paying any out-of-pocket fee at the time of consultation.

4.3.3. Multiple price list

We measure respondents' WTP for each voucher using a variation of the multiple price list (MPL) approach used in the lab and field experiment literatures (Andersen et al., 2006; Anderson et al., 2007; Burchardi et al., 2021; Armand et al., 2021; Shapiro, 2020).[5] First, respondents are presented with a description of the voucher through a simple infographic explaining the steps required to choose a provider, secure an appointment, and have the consultation. Next, they respond to a series of ten choices where they have to say whether they would prefer receiving a specific monetary amount or the voucher. The cash amounts are shown in descending order from ZAR 360 (approximately USD 20) to ZAR 180 (approximately USD 10), in increments of ZAR 20. The upper bound of the price range reflected the market value of the most expensive of the two vouchers, while the lower bound reflected a subsidized price much lower than the cost of the service, determined with conversations with the firm selling the voucher.

To make the choices incentive compatible, participants have a 25% chance that one of their ten choices is selected at random and implemented at the end of the survey (i.e. they receive either the cash or the voucher, depending on what they chose in the randomly selected question). In practice, a few days after the survey cash winners receive their money through a mobile-money service commonly used in South Africa whilst voucher winners receive an email including instructions and a unique code to redeem their voucher. To ensure the validity of responses, we include comprehension and attention checks to make sure that respondents read and understand the explanations.[6] We included three comprehension questions, pertaining to (1) the share of respondents whose choice is selected for real implementation and (2) the consequences of the choices made in a question based on a fictitious respondent. We find that 79% of respondents are able to answer two of the three questions correctly. When respondents incorrectly answer a question, they see a screen with the correct answer and further explanation. We did not exclude respondents if they had failed these questions.

4.4. Measuring perceptions of services

Finally, we elicit individuals' beliefs regarding the relative merits of telehealth and face-to-face consultations with GPs, to help us interpret the drivers of respondents' valuation of the two types of care. To do so, we use a simple vignette in which depicts the case of a patient complaining of a common symptom (chest pain) who can choose between consulting a GP through a face-to-face or telehealth consultation.[7] We chose this clinical case because it enables us to assess understanding of a downside of telehealth, related to the lack of examination. Chest pain can be a sign of serious conditions (e.g. unstable angina or heart failure) and minor ailments (e.g. heartburn). To exclude the severe diagnoses, a physician would have to undertake a physical examination or further investigations, which are not feasible remotely. Respondents are asked to compare these two consultations and share their beliefs regarding (i) the relative competence of providers, (ii) the effectiveness of care, and

[5] In Appendix 4 we provide more information on our multiple price list implementation.

[6] In Appendix 5 we provide the question text, summary statistics on the distribution of the scores on the comprehension question. We also replicate our results tables where we exclude poorly performing respondents, and find our results are largely similar.

[7] In Appendix 6 we provide the text of the vignette used.

(iii) the time spent by the patient to have the consultation.

5. Results

We begin by describing the distribution of WTP for telehealth consultations. In Fig. 2, we present the results as a demand curve, where each point represents the share of respondents in the sample whose WTP for a consultation voucher is equal or greater to a given price. As one might expect, demand for the voucher is downward-sloping, with more people willing to buy the telehealth voucher at lower prices. Only about 36% of respondents are willing to pay an amount greater than the prevailing price of ZAR 290 for the telehealth consultation.

Next, we investigate differences in WTP for a face-to-face and telehealth consultation. In Table 2 we characterize the distributions of WTP elicited for the two types of consultation. Overall, the mean and median WTP for a remote consultation is ZAR 249.35 and ZAR 200 respectively, compared to a mean and median of ZAR 258.63 and ZAR 240.00 for a face-to-face consultation. We can reject the null of equivalence of distribution with a Wilcoxon signed-rank test with p-value of 0.004.

In Table 3, we formally measure the difference in WTP between the two types of consultations by leveraging the within-subject design of our survey, since we elicit the WTP for both types of care for each respondent. We follow Alan et al. (2014) and fit individual fixed-effect Tobit models to control for unobserved within-individual heterogeneity (column 3) and for the fact that the values of the dependent variable are censured.[8] The results confirm that people are willing to pay ZAR28.59 more to see a doctor face-to-face care over a telehealth consultation. In light of a simple conceptual framework, this finding is consistent with two implications. First, the direction of the difference suggests that the convenience premium for telehealth care is outweighed by the quality discount that people expect with remote care. This interpretation is supported by results from vignettes used to assess respondents' perceptions of the merits of face-to-face and remote care (Fig. 3). Three quarters of respondents believe that a telehealth consultation takes less time. Meanwhile, a similar proportion believes that face-to-face providers are more likely to be competent than those offering telehealth consultations, and that face-to-face care is more likely to lead to recovery.

Second, the size of the difference in WTP between telehealth and face-to-fact consultations, representing about 10% of the price of a telehealth consultation, suggests that the low demand for telehealth is not driven by a large quality discount. Instead, the demand for private care in the uninsured population appears low, even when services are presumably of high quality.

Finally, we turn to the role of health needs in the valuation of services. For that, we consider how different measures of health needs influence WTP estimates. Table 4 reports the results from tobit regressions of WTP estimates on health-related measures encompassing care need and prior care-seeking behaviour (columns 2 and 4). While WTP is generally higher among respondents who are older (i.e. aged over for 45), the strongest predictor is respondents' expected likelihood of needing care, which sees a 1-point increase (on a scale of 1–10) being associated with a 6.46 ZAR increase in WTP. Overall, these results confirm the prediction of our conceptual framework that people with higher needs will value a consultation with a doctor at a higher level than those with lower needs.

To what extent are people with higher needs willing to pay more for face-to-face care over remote telehealth care? We investigate this question through some sub-group-analysis, looking at the extent to which WTP differs by level of measures of healthcare need (Table 5). We find evidence that the premium for face-to-face consultation is driven by individuals who report a higher expected care need. In other words, when individuals are planning to seek care, their preference for face-to-face compared to remote consultation is stronger than when they have less pressing needs. This confirms that in-person consultations are more valued in direct response to healthcare needs, in relation to the higher expected quality elicited in vignettes.

6. Discussion

The introduction of information technologies into the supply of common goods and services has upended markets across sectors. Ride-hailing apps have made traditional private taxis obsolete, and home delivery apps are changing the nature of retail shopping (Young and Farber, 2019). Could these technologies be leveraged to address long-standing structural challenges in the organisation of healthcare in LMICs? Some believe so (Schwamm, 2014; Schwarz et al., 2020). Yet, the potential of any novel health technologies is constrained by its demand (Dupas, 2014). To better understand the potential for telehealth services to expand access to care in a new segment of the population, we investigated the demand for private telehealth and face-to-face GP care in South Africa, where telehealth firms have rapidly emerged in the wake of the COVID crisis.

Our study has three main findings. First, nearly two-thirds of respondents are unwilling to pay for a telehealth consultation at the prevailing market price. Second, individuals value face-to-face care more than telehealth consultations, but the magnitude of the premium is low, representing approximately 10% of the price of the telehealth consultation. Our conceptual framework suggests that this premium is the net effect of the perceived quality premium of face-to-face care minus the convenience premium of telehealth. Although we cannot quantify these two effects, the quality premium for in-person care remains higher than the benefits of convenience. Third, consistent with our framework, we find that those with higher perceived needs value telehealth services more, but also have greater WTP for face-to-face care over telehealth care.

Comparisons of these results with existing literature are challenging due to the novelty of the product and method, the limited number of existing studies, and differences in settings. To our knowledge, the only other WTP estimation of primary care telehealth services in LMICs was done in Nigeria Arize and Onwujekwe (2017) found extremely low WTP, at about 2 USD. Yet direct comparisons are difficult due to differences in settings and methodological approaches (i.e. use of stated rather than revealed preference methods). In high-income settings, the literature is larger, but contextually different (Liu et al., 2013; Chang et al., 2017; Suzuki et al., 2019; Stahl and Dixon, 2010).

While the existing evidence on demand for telemedicine may be thin, our findings provide insights into the potential role for private telemedicine in countries similarly characterized by the juxtaposition of a well-resourced private sector and a free but low-quality public sector. Brazil, India and Nigeria are other examples of such countries, where a portion of the population cannot afford a costly private insurance but may sometimes opt for private services (especially if they become more affordable) (Marten et al., 2014).

This study has a number of policy implications. Our results first have implications for the conditions under which telehealth can materialize its promise of expanding access to care. While regulatory barriers to the provision of telehealth have been removed (Paruk et al., 2022), these services are unlikely to expand access to services significantly at current prices. The limited quality discount of telehealth compared to face-to-face consultations also suggests that financial constraints (i.e. general ability to pay for health care), not perceived lower quality, are the main factor behind the low demand. In other words, the financial constraints limiting access to private telehealth services are similar to those limiting access to conventional private services. Expanding access through remote care will therefore require either subsidizing or reducing the price of telehealth to make it more affordable to a larger

[8] In Appendix 7 we provide a more detailed explanation of the regression approach as well as performing specification checks by re-estimating models using alternative approaches (including OLS and interval regression).

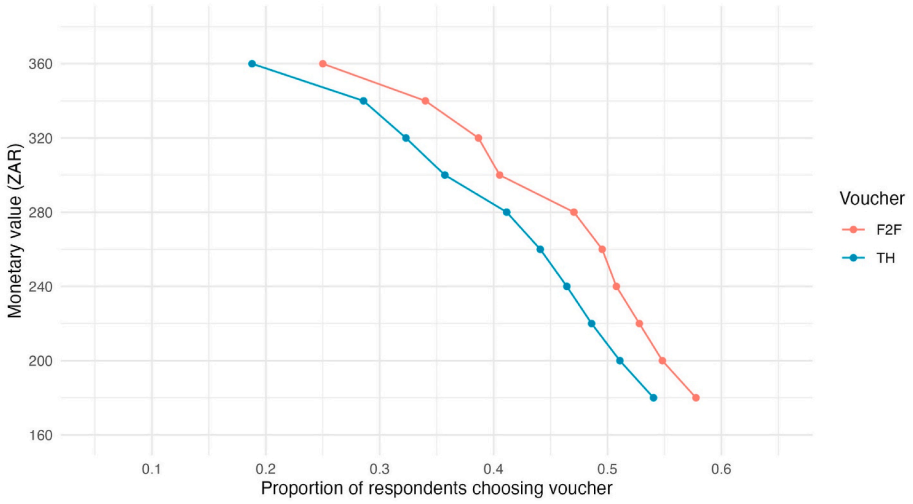

Fig. 2. Demand curves for consultation vouchers.

Table 2
Distribution of WTP for telehealth and face-to-face consultation measures.

	(1)	(2)
	WTP Telehealth *(ZAR)*	WTP Face-to-face *(ZAR)*
Mean	249.35	258.63
Standard deviation	76.65	79.43
Minimum value	180.00	180.00
25th percentile	180.00	180.00
Median	200.00	240.00
75th percentile	340.00	350.00
Maximum value	360.00	360.00
Observations	644	644
P-value Wilcoxon signrank test	0.004	

Notes: This table presents key characteristics describing the distributions of the measures of WTP for telehealth and face-to-face consultations for the study sample. Sample recruited from Google advertisements targeting individuals seeking general practitioner care in South Africa between November 2021 and July 2022. ZAR = South African Rand.

Table 3
Premium for face-to-face consultations.

	(1)	(2)	(3)
	WTP	WTP	WTP
	(ZAR)	*(ZAR)*	*(ZAR)*
F2F	29.73** (13.75)	28.99** (13.30)	28.59*** (9.84)
Controls	N	Y	N
FEs	N	N	Y
Observations	1288	1288	1288

This table contains the results of a regression analysis of the difference in mean WTP between face-to-face and telehealth consultations. Sample recruited from Google advertisements targeting individuals seeking general practitioner care in South Africa between November 2021 and July 2022. For each respondent there is an observation for each, a panel is constructed where individual-level fixed effects are used to control for unobservable traits. Standard errors reported in parentheses. Statistical significance indicated by stars, where ***p < 0.01, **p < 0.05, *p < 0.100. ZAR = South African Rand.

population of uninsured individuals. One cheaper model that has emerged sees nurses providing an initial consultation, with referral to a GP only if necessary (Kena Health, 2023). Yet, moving away from doctor-provided care could further undermine the perceived lower quality of care and reduce demand of telehealth.

Our results also have implications for the role of telehealth in the public sector. Although private telehealth may still be too costly to be an option for under-served populations, there is significant scope to integrate such technology into the public provision of health services and improve access to medical doctors, particularly in rural settings. The eSanjeevani government programme in India is an example of such solution which provides nearly 100 000 daily remote consultations with a doctor, which patients can choose to have from home or from a clinic (HealthMinistry of and Family Welfare, 2023). A similar avenue could be explored in South Africa, at least first through a careful phase of piloting and evaluation (Paruk et al., 2022). A first step would be the revision of the 2019–2024 National Digital Health Strategy for South Africa (Department of Health, South Department of HealthSouth Africa, 2019), which was written prior to the legalization of direct-to-consumer telemedicine care and therefore does not consider the use of such technology.

A final implication of our findings relates to the potential complementary role of telehealth and in-person care. We found that individuals with lower expected needs were indifferent between telehealth and face-to-face services, unlike those with higher needs who valued significantly more in-person consultations. This contrast suggests two complementary role for the two types of care. Telehealth services are likely more suited for simple consultations with patients, such as routine follow-up consultations or simple requests, where patients might be reassured that the service provided will easily meet their needs. While these two types of services are currently presented as substitutes, marketing them for different purposes may align perceptions of quality and value.

This study has some limitations. The first one relates to concerns about the generalizability of findings to a broader sample. Study participants were recruited online, therefore were likely more technologically savvy, making telehealth consultations more appealing to them than the general population. If this is true, our WTP measure is overestimated, suggesting that the reach of the private telehealth market is even smaller than our findings suggest. Furthermore, we ran the survey during the COVID pandemic (between November 2021 and July 2022). During this period, lockdown stringency had eased significantly and there were no explicit restrictions on leaving the house for healthcare seeking. Nevertheless, preferences for remote care may have been higher, due to concerns about contracting COVID during in-person visits. If this positive effect on the valuation of telehealth care was only temporary, the WTP beyond the COVID-era is likely lower that our estimates. Overall, both concerns point to the fact that our estimates might represent upper bounds of the WTP for telehealth services.

A final limitation arises from the scope of health services we consider. The vouchers used in the WTP survey are for a consultation with a GP and do not pertain to a particular service or need. We chose

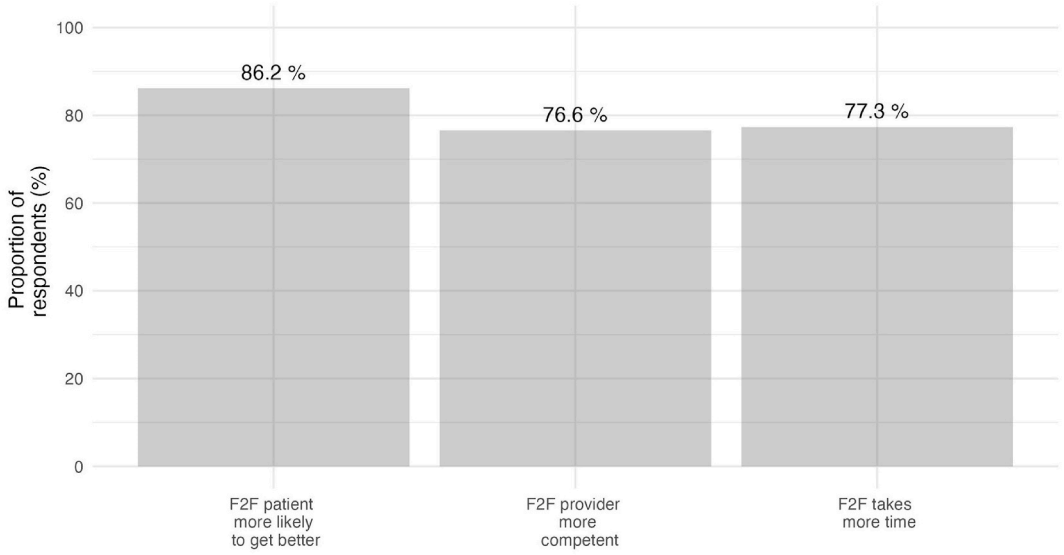

Fig. 3. Perceptions of consultation types.

Table 4
Correlates of WTP for telehealth consultations.

	(1)	(2)	(3)	(5)
	Telehealth consultation WTP	Telehealth consultation WTP	Telehealth consultation WTP	Telehealth consultation WTP
	(ZAR)	*(ZAR)*	*(ZAR)*	*(ZAR)*
Age 46 years old or older	72.38** (28.83)	67.27** (28.72)	64.89** (29.09)	62.22** (28.97)
Expected likelihood of needing care (1–10)		7.21** (3.04)		6.46** (3.09)
Any chronic disease			30.89* (18.54)	23.02 (18.80)
Observations	644	644	644	644

Notes: This table contains results from tobit regressions of WTP for telehealth consultations (ZAR) on measures of health need and socioeconomic characteristics of respondents as controls. Sample recruited from Google advertisements targeting individuals seeking general practitioner care in South Africa between November 2021 and July 2022. Controls not shown but included in all specifications are gender, race, secondary school completion, employment status, household income quintile, and urban/rural. All models are two-sided tobit models, with outcome with a lower limit of ZAR180 and upper limit of ZAR360. Standard errors reported in parentheses. Statistical significance indicated by stars, where ***p < 0.01, **p < 0.05, *p < 0.10. ZAR = South African Rand.

this product because it is currently offered in the private sector. Yet this choice limits the extent to which our results generalize to other more specialized services, which may lend themselves well if not better for remote delivery, and therefore be more attractive to consumers. Examples include mental health care (see Adepoju (2020)) or the management of stable chronic disease (see Hoffer-Hawlik et al. (2020)). Further research would need to explore the demand for such services, in South Africa and other LMIC settings.

In conclusion, although telehealth technologies have the potential to address access to healthcare, the limited willing to pay for such services remains a barrier that limits its potential benefits. Should private telehealth platforms be used to expand access to underserved populations, this would require finding ways to lower its cost without compromising the quality of care offered.

Table 5
Heterogeneity in premium for face-to-face consultations.

	(1)	(2)	(3)
	WTP	WTP	WTP
	(ZAR)	*(ZAR)*	*(ZAR)*
F2F	−10.46 (18.88)	15.89 (10.04)	28.24*** (10.22)
F2F x Expected likelihood of needing care (1–10)	6.80** (3.01)		
F2F x Any chronic disease		25.80 (17.70)	
F2F x Age 46 years old or older			2.76 (33.94)
FEs	Y	Y	Y
Observations	1288	1288	1288

Notes: This table contains the results of a regression analysis of the difference in mean WTP between face-to-face and telehealth consultations. Sample recruited from Google advertisements targeting individuals seeking general practitioner care in South Africa between November 2021 and July 2022. For each respondent there is an observation for each, a panel is constructed where individual-level fixed effects are used to control for unobservable traits. Standard errors reported in parentheses. Statistical significance indicated by stars, where ***p < 0.01, **p < 0.05, *p < 0.100. ZAR = South African Rand.

CRediT authorship contribution statement

Mylene Lagarde: Conceptualization, Funding acquisition, Writing – review & editing. **Irene Papanicolas:** Conceptualization, Funding acquisition, Writing – review & editing. **Nicholas Stacey:** Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Validation, Visualization, Writing – original draft, Writing – review & editing.

Declaration of competing interest

The authors declare no conflicts of interest.

Data availability

Data will be made available on request.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.socscimed.2024.116570.

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