



Telemedicine in Diabetes Follow-Up: A Narrative Review of Equity Effects Four Years On

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Abstract

Telemedicine expanded abruptly in 2020 and has since settled at a fraction of its peak, with telehealth use among one large insured population falling from 48 per cent in 2020 to 29 per cent in 2022 and stabilising near 25 per cent. The equity question has changed shape accordingly. It is no longer whether disadvantaged patients receive remote care but which kind. In an analysis of 41,583 patients with 127,165 office, 39,484 telephone and 20,268 video visits, those in more deprived neighbourhoods had higher odds of telephone against office visits, lower odds of video against office visits, and higher odds of telephone against video. Reporting that combines audio and video under a single heading conceals this. A separate analysis found no compensating increase in in-person care among the most deprived, the uninsured or those outside metropolitan areas, indicating reduced contact overall rather than a shift between modalities.

Keywords: Telemedicine; Health equity; Digital divide; Diabetes follow-up; Video consultation

Introduction

Health systems expanded telemedicine rapidly in 2020, and reimbursement changes removed the principal barrier to its use [1,2]. Diabetes was among the conditions most readily transferred to remote follow-up, being consultation-based and dependent on data the patient can supply [3,4,24,25]. Telemonitoring with team-based management has been tested in cluster-randomised designs [24], and patient preference and satisfaction reviewed separately [25].

Concern about equity was raised immediately and has been examined extensively [5,6,29,30,31]. Policy analyses framed digital health equity as a requirement rather than an aspiration early in the expansion [30,31]. Four years on, the pattern of use has stabilised at a level well below the peak, which changes what the equity question is asking [7,8].

This review examines what has been measured about who receives remote diabetes follow-up and in what form, why the distinction between telephone and video matters more than it appears to, and what the evidence base itself omits.

Material and Methods

Search strategy: PubMed and the archives of the major health services research, informatics and diabetes journals were searched for studies of telemedicine access and equity. Search terms combined telemedicine and telehealth with disparities, area deprivation, video visit, telephone visit and diabetes. Reference lists of the principal deprivation analysis [9] and a policy brief on digital inclusion [7] were screened by hand for primary sources.

Eligibility: Studies were included if they reported use of remote care by defined population characteristics, distinguished modalities, or examined outcomes of remote diabetes follow-up. Studies conflating audio and video are cited where relevant and identified as such.

Data extraction and handling: Setting, period, population and the modality distinction applied were extracted as published. Whether a study separated telephone from video is stated in every case, because the two differ substantially in what can be assessed and combining them changes the apparent direction of

the equity finding. This review reports measured utilisation patterns and makes no recommendation about the delivery of care to any individual or service. No pooling or re-analysis was performed. Figures 1 to 6 and Tables 1 to 3 reproduce published values only. This is a narrative synthesis and was not registered as a systematic review.

Results

Where use has settled: Telehealth use among beneficiaries of one large public insurance programme fell from 48 per cent in 2020 to 29 per cent in 2022, stabilising thereafter at approximately 25 per cent (Figure 3) [7,10]. Across surgical specialties four years after the pandemic, telemedicine accounted for 4.5 per cent of 1,514,060 visits, with wide variation between specialties [11].

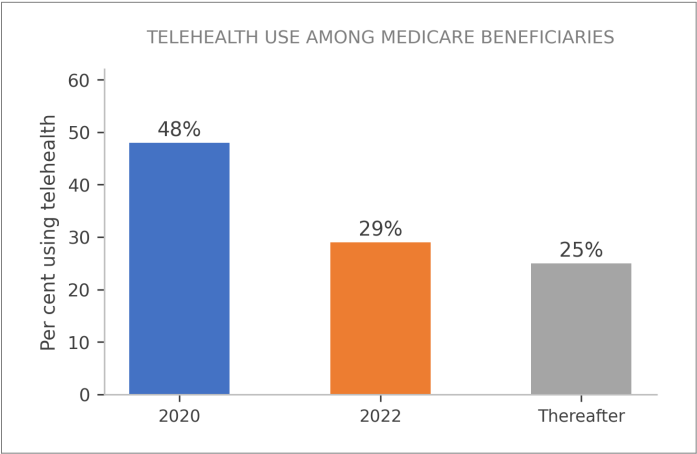


Figure 3: Telehealth use among beneficiaries of a public insurance programme [7,10]

Portal use moved the other way: Over the same period, patient portal use rose from 38 per cent in 2020 to 57 per cent in 2022 and 65 per cent in 2024 (Figure 4) [7,12]. Portals are used more frequently and across a fuller range of conditions than synchronous consultation, and are less studied, although reports concerning them are more likely to address digital equity [7].

Modality by deprivation: An analysis of primary care visits between March 2020 and December 2021 included 41,583 patients with 127,165 office visits, 39,484 telephone visits and 20,268 video visits (Figure 1). Compared with patients in the least deprived quartile, those in more deprived quartiles had higher odds of using telephone rather than office visits, lower odds of using video rather than office visits, and higher odds of using telephone rather than video (Figure 2) [9]. The investigators concluded that patients in socioeconomically disadvantaged neighbourhoods relied mainly on telephone consultation [9].

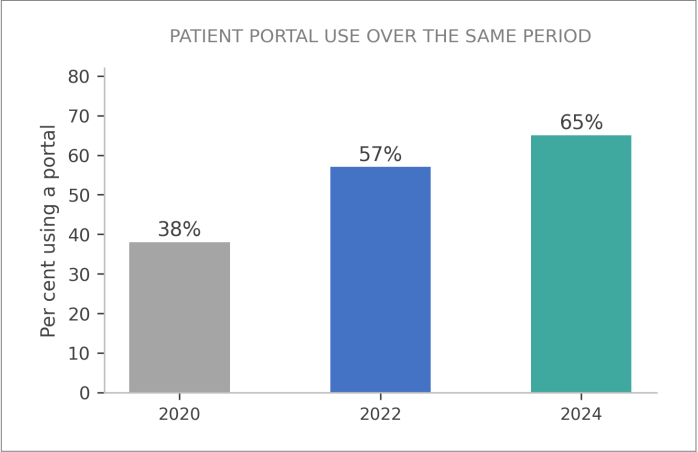


Figure 4: Patient portal use over the same period [7,12]

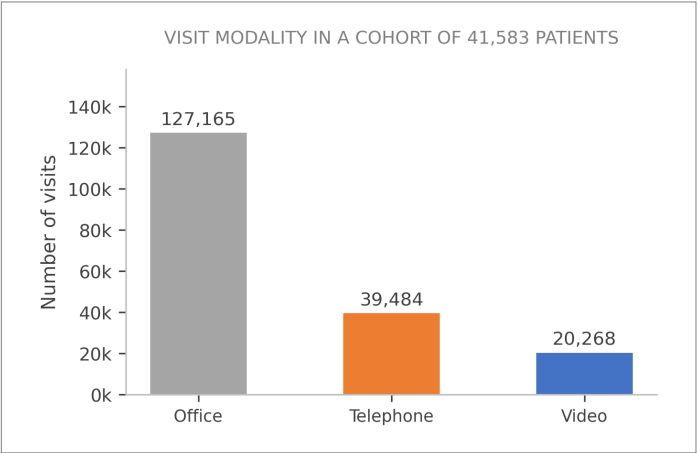


Figure 1: Visit modality in a cohort of 41,583 patients [9]

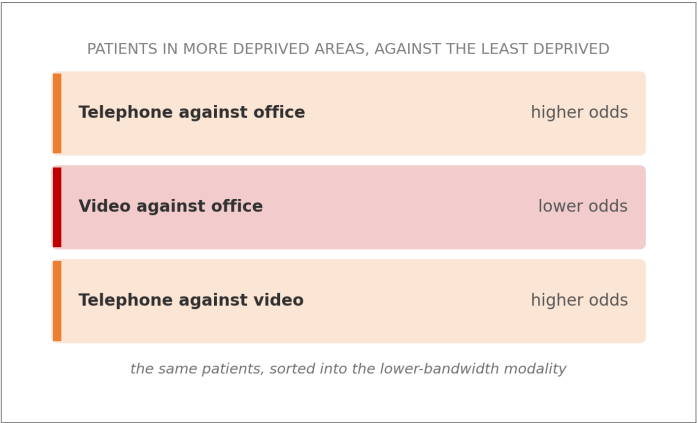


Figure 2: Direction of the deprivation effect on modality [9]

Modality	Visits recorded	Share of the total
Office	127,165	68.1%
Telephone	39,484	21.1%
Video	20,268	10.8%

Table 1: Visit modality in the deprivation analysis, as reported [9]

Who used remote care less: A separate analysis found lower uptake of telemedicine among patients who were older, female, American Indian or Alaska Native, who required an interpreter, or who lived in the most deprived quartile (Figure 5) [13,14]. Populations most affected by the digital divide, namely older

adults, low-income households and people without college degrees, are underrepresented in digital health studies, so real-world effectiveness may be lower than research suggests [7,15].

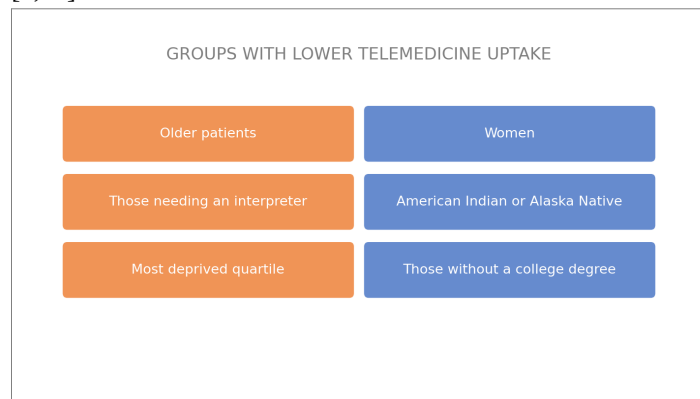


Figure 5: Groups with lower telemedicine uptake [7,13,14]

What did not compensate: In the same analysis, lower telemedicine use was offset by higher in-person attendance for some groups, including those aged 45 to 64, those over 65, retired patients and those requiring interpreters. But no increase in either in-person or remote care was observed among patients living in areas of high deprivation, the uninsured, or those in non-metropolitan areas (Figure 6) [13]. The investigators concluded that marginalised populations were not receiving equal access to either form of care [13].

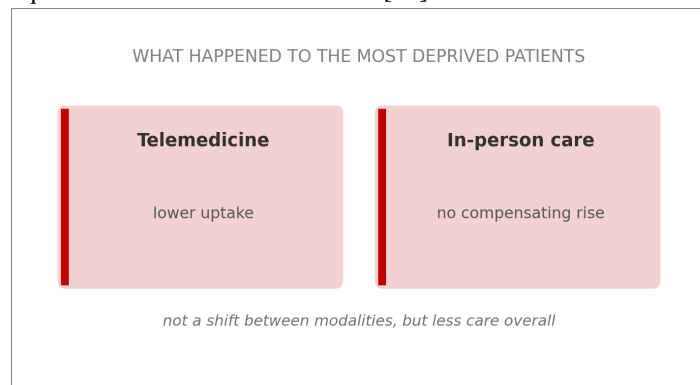


Figure 6: What happened to the most deprived patients [13]

Group	Telemedicine	In-person
Aged 45 to 64	Lower	Higher
Aged over 65	Lower	Higher
Requiring an interpreter	Lower	Higher
Most deprived areas	Lower	No increase
Uninsured	Lower	No increase
Non-metropolitan	Lower	No increase

Table 2: Whether reduced remote care was offset by in-person attendance [13]

Older adults specifically: Comparison of telephone with video consultation in geriatric primary care examined whether video visits had longer duration, more recorded diagnoses and more advance care planning discussion than telephone visits, and whether disparities in visit type existed by patient characteristic [16]. Barriers to video consultation among older adults in

supported living have been assessed directly, and reviews have set out approaches to addressing them [17,18,22]. Diabetes distress has been reported to affect telemedicine use in older adults specifically [23].

Observation	Implication
Audio and video are often combined	Disparity is concealed in the headline [7]
Deprived patients receive telephone	Lower-bandwidth care, not less care [9]
No compensating in-person increase	Less total contact for some groups [13]
Digital divide groups understudied	Effectiveness may be overstated [7,15]

Table 3: What the utilisation data indicate

Language as a separate axis: Patients with limited English proficiency used video consultation less than others during the expansion, and in multilingual safety-net settings interest in video visits exceeded the ability to complete them [21,33]. Requiring an interpreter compounds the problem, since a three-way telephone consultation is harder to conduct than either an in-person or a video equivalent [13,21].

What remote diabetes care can achieve: Separately from the equity question, telemedicine interventions have improved diabetes management in randomised and observational studies, including in Black and Hispanic populations and in paediatric type 1 diabetes [19,20,26]. Those studies establish that the modality works; they do not address who receives it, and the two literatures have largely been conducted separately [3,27].

Discussion

The equity question has changed since 2020 and the literature has partly not kept up. When remote care was the only care, the question was who could reach it at all. Now that use has settled at around a quarter of its peak in one large programme, and in-person care has resumed, the question is which patients are steered into which modality [7,9,10].

On that question the finding is consistent and specific. Patients in more deprived neighbourhoods had higher odds of telephone consultation and lower odds of video, relative to office visits and relative to each other [9]. They were not excluded from remote care; they were sorted into the version of it that carries less information. A telephone consultation cannot show an injection site, a foot, or a glucose display, and in diabetes follow-up those are not incidental.

This is why the measurement convention matters more than it looks. Much digital health research reports synchronous telehealth as a single category, combining audio and video [7]. Under that convention the deprivation gradient largely disappears, because the deprived patients are counted as telemedicine users. The disparity is not absent from the data; it is absent from the variable.

The finding that should concern services most is the one about substitution. Where older patients and those needing interpreters used less telemedicine, they attended more in person, which is a modality shift and reasonable enough. Among the most deprived, the uninsured and those outside metropolitan areas, neither rose [13]. That is not a distributional question about how care is delivered; it is less care.

A caution about the vintage of this evidence, which the title of this review makes unavoidable. The deprivation analysis covers March 2020 to December 2021, the peak period, and the strongest four-year data available concern overall utilisation rather than equity [9,11]. Whether the modality gradient persists now that in-person care is freely available is not established, and it is the question a service planning its follow-up model actually needs answered.

There is a design implication that follows without needing further data. If telephone is what deprived patients predominantly receive, then services choosing to deliver diabetes follow-up remotely should decide what a telephone review can and cannot accomplish, and schedule accordingly [9,16]. Treating audio and video as interchangeable in service planning reproduces the same conflation that obscures the disparity in the research [7].

The other implication concerns measurement. A service that records only whether a contact was remote cannot detect this gradient in its own population, which means the first step for any service concerned about it is to record modality separately [7,9]. That is a data field rather than a programme, and it is the cheapest part of the response.

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Study limitations

The limitations belong to the underlying literature. The principal modality analysis is retrospective, from a single health system, and covers the pandemic period rather than current practice [9]. Deprivation is measured at area level, which misclassifies individuals within heterogeneous neighbourhoods [9,13]. Studies that combine audio and video cannot contribute to the modality question at all, and they are numerous [7]. Utilisation is not an outcome, and none of the studies reviewed here links modality to glycaemic or clinical results in diabetes [3,4,26]. Telehealth interventions have improved diabetes management in some populations, but those studies do not address modality equity [20,26]. The populations most affected by the digital divide are underrepresented in this research, so the disparity may be understated [7,15]. Four-year utilisation data come largely from settings and specialties other than diabetes [11]. Insurance and reimbursement arrangements differ substantially between health systems, so patterns do not transfer [1,2,32]. Safety-net and multilingual settings report distinct barriers again, including limited English proficiency and interest that exceeds access [8,21,33]. Cohort descriptions of who used telehealth in urban systems during the expansion, and of remote nutrition consultation, add further population detail [28,34]. And portal use and synchronous consultation are studied separately although patients experience them as one service [7,12].

Conclusion

Four years after the expansion, remote care has settled at roughly a quarter of its peak in one large programme while patient portal use has continued to rise. The equity problem has moved with it. Patients in deprived neighbourhoods are not excluded from remote consultation; they are disproportionately given the telephone rather than video, which is a lower-bandwidth encounter and in diabetes follow-up a materially different one. Research that reports audio and video together loses this entirely, so the convention is doing real work. And for the most deprived, the uninsured and those outside metropolitan areas, reduced remote care was not offset by more in-person attendance, which makes the finding about the amount of care rather than its format.

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Conflict of Interest

The authors declare no competing interests.

Ethics Statement

This article reviews previously published studies only. No new patient data were collected and no participants were recruited, so ethical approval was not required.

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