Direct-to-consumer telemedicine: navigating the implications for quality and safety of care

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Patients are increasingly seeking more accessible, simpler and more streamlined experiences across healthcare. These evolving expectations offer healthcare providers new opportunities to engage with service users, through a growing wave of direct-to-consumer care solutions. The advent of home diagnostics, online pharmacies and, importantly, telemedicine are some key examples of this emerging trend.[1 2]

By enhancing accessibility, enabling timely care and improving patient engagement, telemedicine holds the potential to significantly improve health outcomes and, potentially, the overall efficiency of healthcare delivery.[3] In particular, direct-to-consumer telemedicine allows users to independently initiate medical services remotely. By bypassing traditional intermediaries such as referral clinicians or facilitators, users can establish a direct engagement with healthcare providers via text messaging, video or telephone calls. Despite the advancements in telemedicine adoption during the pandemic,[4] its impacts on the various dimensions of quality, as defined by the Institute of Medicine[5] (ie, patient-centredness, effectiveness, efficiency, timeliness, safety and equity), remain largely unexplored.

The study by Zeng *et al*[6] in this issue of *BMJ Quality & Safety* makes a valuable contribution to this knowledge gap, by assessing the quality of direct-to-consumer telemedicine services in China. As explained in the paper, direct-to-consumer telemedicine services in China are mainly provided through two models: hospital sponsored (ie, linked to single physical hospitals and primarily using in-house staff) and enterprise sponsored (ie, supported by larger corporations and providing access to a wider network of providers). Specifically, this study compared the impact of the two main models on five of the six domains of quality of care: patient-centredness, effectiveness, efficiency, timeliness and safety. To this end, the authors employed trained individuals to act as standardised patients in announced encounters with telemedicine services. These individuals consistently portrayed 10 specific medical conditions (ie, diabetes, asthma, common cold, gastritis, angina, low back pain, childhood diarrhoea, childhood dermatitis, stress urinary incontinence and postpartum depression) in a total of 170 encounters (52 on enterprise-sponsored platforms, and 118 on hospital-sponsored platforms). The results offer preliminary insights with significant implications for the future adoption and scaling up of telemedicine and of direct-to-consumer telemedicine services in particular.

First, the analysis highlights a low overall correct diagnosis rate of 50%—and low adherence to published guidelines for consultation (15%) and management decisions (30%). Diagnostic errors have a substantial burden globally, with one study estimating that about 5% of US adult patients experience diagnostic errors in outpatient settings every year.[7] Similarly, a retrospective medical record review of 21 practices in North West England reported a possible, likely or certain missed diagnostic opportunity in 4.3% of the consultations evaluated.[8] These findings need to be analysed from a 'systems thinking' perspective, as diagnostic errors often reflect healthcare system complexities and vulnerabilities and typically have multiple 'root causes' that go beyond the actual service delivery model.[7] Additionally, although the findings of this study by Zeng *et al* raise important concerns about misdiagnosis rates in direct-to-consumer telemedicine, it is equally important to

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consider how these values compare with usual care in the same context. Rigorous research should compare the incidence and epidemiology of diagnostic error in similar services delivered through a face-to-face versus direct-to-consumer telemedicine consultation, as well as to understand the role of contributory factors and whether these differ between these service delivery models.[9]

Second, the authors highlight concerns about the timeliness of direct-to-consumer telemedicine services, with an initial mean response time of 3 hours and 47 min, and an overall mean interaction time of 12 hours and 19 min. The authors suggest these results could be explained by the fact that direct-to-consumer telemedicine in China operates asynchronously. As for misdiagnosis rates, it would also be important to benchmark these values against face-to-face care and non-direct-to-consumer telemedicine platforms. These findings also call for a careful examination of the system's ability to triage urgent requests, as well as of the processes and strategies in place to ensure their prioritisation. Importantly, further research should address the ethical and legal implications of these aspects for those receiving and providing care.

Further explorations about the appropriateness and safety of response timings and communication patterns, which may (and likely will) vary according to the clinical characteristics of the clinical encounters, should also be considered. With the advent of artificial intelligence-based approaches in healthcare,[10 11] there is an emerging opportunity to leverage data for risk stratification and improved diagnosis, thus embedding data-driven insights and decision support tools in telemedicine platforms to ensure that those in greatest need receive timely care.

Third, when comparing the models, the authors found that enterprise-sponsored platforms outperformed hospital-sponsored platforms in terms of accessibility, response time and case management. Such differences between the two direct-to-consumer telemedicine models warrant further research: what are the underlying factors driving this variation? Are they structural (ie, resource, capacity) or process related (ie, workflows, patient pathways)? A broader contextual analysis is necessary to comprehend these variations. For example, performing a PESTLE (Political, Economic, Social, Technological, Legal and Environment) analysis[12] of the implementation process could provide more nuanced insights on the drivers for variation, as well as expose opportunities for cross-learning.

While relevant from both a clinical and policy perspective, the findings from the study of Zeng *et al* are based on only 10 different clinical cases, each representing a specific medical condition. This limited scope may not adequately capture the complexity and variety of presentations seen in a real-world setting. Additionally, while the Institute of Medicine's framework[5] describes quality across six domains (ie, patient-centredness, effectiveness, efficiency, safety, timeliness and equity), the last domain was not assessed in this study. Digital innovation carries a well-recognised, inherent risk of perpetuating existing inequities for those who might lack access, knowledge or skills to fully embrace the potential of these innovations.[13] Future research should prioritise incorporation of these equity considerations into the scenarios evaluated. Leveraging real-world data could provide additional insights to address the digital divide and ensure that telemedicine interventions benefit all segments of the population equitably.

Moreover, the combination of a direct-to-consumer approach and use of telemedicine as a service delivery model introduces additional complexities to the interpretation of these results. The effects documented in this paper may be partially influenced by the enhanced access provided through a direct-to-consumer route—an influence that might be less pronounced in a telemedicine model that includes traditional intermediaries, such as gatekeepers or referral organisers. An alternative approach to disentangle these different aspects could, for example, involve a three-arm randomised controlled trial comparing face-to-face care, telemedicine with traditional intermediaries and direct-to-consumer telemedicine.

While this study provides a valuable preliminary assessment of the impact of direct-to-consumer telemedicine, the findings call for a more comprehensive evaluation of the safety implications of such solutions. Specific recommendations to further advance this research field could include:

- Augmenting the spectrum of metrics considered, including the impact on the wider healthcare system (eg, spillover effects such as costs resulting from follow-up consultations, subsequent admissions and emergency department use).
- Using mixed methodologies to gain more nuanced insights, particularly to gain deeper understanding on the impacts on patient-centredness and equity of care.
- Leveraging the power of routinely collected healthcare data for impact assessment.

Altogether, these strategies will not only help in mitigating potential unintended safety consequences for patients but, critically, support the intended goal of delivering high-quality and equitable telemedicine services across the continuum of care.

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REFERENCES

1 Burki T. Direct-to-consumer services: improving access to care for people with diabetes and obesity. *Lancet Diabetes Endocrinol* 2024;12:305.
2 Wittman SR, Hoberman A, Mehrotra A, *et al*. Antibiotic receipt for pediatric telemedicine visits with primary care vs direct-to-consumer vendors. *JAMA Netw Open* 2024;7:e242359.
3 Campbell K, Greenfield G, Li E, *et al*. The impact of virtual consultations on the quality of primary care: systematic review. *J Med Internet Res* 2023;25:e48920.
4 Li E, Tsopra R, Jimenez G, *et al*. General practitioners' perceptions of using virtual primary care during the COVID-19 pandemic: an international cross-sectional survey study. *PLOS Dig Health* 2022;1:e0000029.
5 Institute of Medicine (US)Committee on Quality of Health Care in America. *Crossing the quality chasm: a new health system for the 21st century*. Washington (DC): National Academies Press (US), 2001. Available: http://www.ncbi.nlm.nih.gov/books/NBK222274/
6 Zeng Z, Xu DR, Cai Y, *et al*. Assessing quality of direct-to-consumer telemedicine in China: a cross-sectional study using unannounced standardised patients. *BMJ Qual Saf* 2024;33:609–12.
7 Singh H, Meyer AND, Thomas EJ. The frequency of diagnostic errors in outpatient care: estimations from three large observational studies involving US adult populations. *BMJ Qual Saf* 2014;23:727–31.
8 Cheraghi-Sohi S, Holland F, Singh H, *et al*. Incidence, origins and avoidable harm of missed opportunities in diagnosis: longitudinal patient record review in 21 english general practices. *BMJ Qual Saf* 2021;30:977–85.
9 Zwaan L, Schiff GD, Singh H. Advancing the research agenda for diagnostic error reduction. *BMJ Qual Saf* 2013;22 Suppl 2:ii52–7.
10 Jindal A, Sumodhee D, Brandao-de-Resende C, *et al*. Usability of an artificially intelligence-powered triage platform for adult ophthalmic emergencies: a mixed methods study. *Sci Rep* 2023;13:22490.
11 Zhai Q, Lin Z, Ge H, *et al*. Using machine learning tools to predict outcomes for emergency department intensive care unit patients. *Sci Rep* 2020;10:20919.
12 Basu R. *Implementing quality: a practical guide to tools and techniques: enabling the power of operational excellence*. 1st edn. London: Thomson Learning, 2004.
13 Adedinsewo D, Eberly L, Sokumbi O, *et al*. Health disparities, clinical trials, and the digital divide. *Mayo Clin Proc* 2023;98:1875–87.