How do online doctor consultations compare to in-person ones?

Consulting doctors online offers convenience and accessibility for patients, and the prospect of much needed cost savings. ***Amanda Dahlstrand****,* ***Nestor Le Nestour*** *and* ***Guy Michaels*** *studied the impacts of switching consultations from in person to online. They write that online consultations are more likely to be followed up in person (which reduces their cost savings for providers and patients), but don't result in adverse medium-term effects on patients.*

In today's hybrid world, many decisions affect which one-to-one services, such as financial advice, tutoring or healthcare, are delivered online and which ones in person, and to whom. Although the shift to online provision can potentially lower costs and increase convenience, the nature of service meetings may differ significantly when conducted through a screen. As a result, switching services to an online format can affect costs, quality, user experience and downstream outcomes. Despite the increased prevalence of online provision in recent years, there is limited evidence from direct head-to-head comparisons of in-person and online one-to-one services. To better inform decision-makers, we need a deeper understanding of the trade-offs involved.

Choosing the appropriate delivery mode is particularly important in healthcare. For providers, including both private and public healthcare organisations and insurers, the shift to online services presents opportunities for productivity gains, which are urgently needed due to rising costs in ageing societies. For patients, online healthcare services provide convenience, around-the-clock access, time savings, reduced risk of contagion and the potential to level the playing field between urban and rural areas as well as rich and poor ones. Key to healthcare delivery are patient consultations with primary care physicians (PCPs), also known as general practitioners (GPs).

Our research examines the impacts of switching doctor consultations from in-person to online meetings on various patient outcomes and provider costs. To do so, we assemble new data on individual consultations from Sweden, where national health insurance covers both public and private providers. The primary contributor of our data is Europe's

largest digital healthcare firm, which, since 2019, has provided registered patients with comprehensive primary care, including both in-person and online doctor consultations. The data we analyse encompass both consultation types and are matched with anonymised individual panel data on patient demographics, socioeconomic characteristics and numerous health outcomes from the rest of the healthcare system.

Challenges

One challenge in comparing online and in-person consultations is that we rarely observe patients in both modes. However, we focus on patients registered with a primary care provider that offer both types of consultations. We focus only on patients who were directed to nurses during times when all doctors were busy. The nurses then determined whether the patients should consult (as soon as possible) with a doctor, and whether this consultation should be in-person or online. These two features allow us to compare the differing effects of the two modes for similar patients.

A second challenge arises because nurses may sort patients to online (as opposed to in-person) doctor consultations based on factors that we cannot observe. To address this issue, we use variation in nurses' tendency to direct patients online, as measured in other meetings. This allows us to approximate the effects of randomly allocating patients to the two consultation modes.

Our methodology for addressing sorting reveals that the cost savings from online consultations are lower than those using simpler comparisons. This suggests that on average, sicker patients are directed to in-person consultations, a sorting problem that we address. Our estimates indicate that compared to in-person doctor consultations, online consultations occur sooner and are shorter overall, entailing shorter patient-facing time and longer administrative time for the doctor (to write prescriptions and notes after seeing the patient). They also yield similar within-consultation outcomes to in-person ones, including rates of informative diagnosis, prescriptions, specialist referrals and patient satisfaction ratings.

We next examine the effect of online consultations on hospitalisations that could have been avoided with timely primary care, overall hospitalisations, visits to the emergency department (ED), also known as accident and emergency (A&E), and new visits to the primary care provider within 30 days after the nurse meeting or the doctor consultation.

We find no statistically significant effect on avoidable hospitalisations, an imprecisely estimated increase on overall hospitalisations, and significant increases in ED visits and doctor-booked in-person follow-up consultations. However, for medium-term outcomes (more than 30 days after the doctor consultation), we find no significant effects on any of these four outcomes.

Taken together, our estimates suggest that online consultations offer some cost savings to providers without significant medium-term adverse health effects on patients. However, the increased short-term follow-ups reduce these cost savings for providers from around 75 per cent to just 20 per cent and effectively eliminate cost savings for patients. While these findings indicate that online consultations are not a cost panacea, they still provide patients valuable advantages, such as the ability to consult doctors sooner, reduced contagion risk, and greater scheduling flexibility, including availability outside regular work hours.

High follow-up rates

We also note that our estimates show relatively high follow-up rates for two reasons. First, we study patients directed to consultations by nurses, and those patients are likely sicker and more prone to follow-ups than patients not directed to consultations. Second, our sample mostly consists of patients from big cities (where in-person clinics were first opened), for whom in-person follow-ups are less time-consuming than patients in remote areas. Thus, directing the average Swedish patient to an online consultation (versus an in-person one) is likely to yield larger social savings than those in our sample.

We also find that patients generally view online consultations as replacements for in-person ones. However, older patients and immigrants are more sceptical of online consultations. Given this finding and our results on sorting into online consultations, we explore the possibility that online consultations may be better suited for less vulnerable patients. Consistent with this hypothesis, we find suggestive evidence that patients with histories of hospitalisations or ED visits are considerably more likely to follow up after online consultations than other patients. We also find that directing vulnerable patients to in-person consultations and less vulnerable ones to online consultations may save costs for both providers and patients.

By examining a setting where assignment to online versus in-person care occurs after

patients have already requested care, we shed light on the respective effects of online and in-person delivery, free from concerns about the sorting of different patients (or the same patients under different symptoms) into care when based on their expectations of online or in-person consultations and from providers' sorting of patients into modes.

Taken together, our findings suggest that demand for in-person follow ups after online provision and differences in patients' needs are important considerations for hybrid health organisations. These and other considerations may affect the organisation of other hybrid one-to-one services in a large number of providers worldwide. This is an area of growing importance, and more evidence is needed from other settings on how to organise such hybrid provision effectively.

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