

# The impact of increased outpatient telehealth during COVID-19: Retrospective analysis of patient survey and routine activity data from a major healthcare system in England

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## Abstract

In response to societal restrictions due to the COVID-19 pandemic, a significant proportion of physical outpatient consultations were replaced with virtual appointments within the Bristol, North Somerset and South Gloucestershire healthcare system. The objective of this study was to assess the impact of this change in informing the potential viability of a longer-term shift to telehealth in the outpatient setting. A retrospective analysis was performed using data from the first COVID-19 wave, comprising 2998 telehealth patient surveys and 143,321 distinct outpatient contacts through both the physical and virtual medium. Four in five specialities showed no significant change in the overall number of consultations per patient during the first wave of the pandemic when telehealth services were widely implemented. Of those surveyed following virtual consultation, more respondents 'preferred' virtual (36.4%) than physical appointments (26.9%) with seven times as many finding them 'less stressful' than 'more stressful'. In combining both patient survey and routine activity data, this study demonstrates the importance of using data from multiple sources to derive useful insight. The results support the potential for telehealth to be rapidly employed

across a range of outpatient specialities without negatively affecting patient experience.

#### KEYWORDS

coronavirus, COVID-19, outpatient services, telehealth

## 1 | INTRODUCTION

The COVID-19 pandemic has precipitated a significant change in the delivery of acute outpatient consultations.<sup>1</sup> In order to ensure the safety of patients and staff, a substantial proportion of appointments were moved from a physical to a virtual setting during the first wave of the pandemic within the Bristol, North Somerset and South Gloucestershire (BNSSG) healthcare system.

Aside from infection control, possible advantages of telehealth extend to a cost and time saving for the patient due to the lack of required travel<sup>2</sup> and lesser costs for healthcare providers due to reduced estate and workforce requirements.<sup>3</sup> Citing these benefits, the English National Health Service was already aiming to reduce up to one-third of face-to-face outpatient attendances prior to COVID-19.<sup>4</sup>

However, there are a number of potential drawbacks. The extent to which clinical effectiveness can be sustained in a virtual setting is unclear.<sup>5</sup> Concerns also exist on the grounds of patient experience, specifically regarding at-home privacy, continuity of care, and empathy,<sup>6</sup> as well as exacerbating social health inequalities.<sup>7</sup>

Before the pandemic, investigators have found a varying degree of success in telehealth initiatives, including substantial differences in the effective uptake between alternate clinical specialities.<sup>8</sup> Empirical evidence during the pandemic provides a generally positive assessment of their use, with examples from ophthalmology<sup>9</sup> and orthopaedics.<sup>10</sup> However, few studies so far have utilised data from multiple sources, and this may limit the depth of any resulting insight.

In considering a range of typical outpatient specialities, the aim of this study was to leverage both patient survey and routine activity data in generating key insights regarding the use of virtual consultations. This information would be useful to clinicians and planners within the BNSSG system and beyond in appraising the longer-term use of outpatient telehealth services.

## 2 | METHODS

### 2.1 | Patient survey data

A total of 2998 patient surveys were completed in the 3 months from June through August 2020. The surveys were performed immediately following virtual outpatient consultations for patients of the University Hospitals Bristol and Weston NHS Foundation Trust.

Patients were selected for virtual consultations by clinicians at the Trust based upon perceived technical and clinical suitability to the electronic medium. Individuals were deselected if they were deemed of lacking support to use the technology or if a detailed physical or otherwise intimate examination was required.

The web-based survey included 12 questions covering whether it was the patient's first virtual consultation and what electronic device they had used; service-level details such as medical speciality; experience relating to perceived effectiveness and any technological difficulties; and future preferences regarding physical or virtual consultations. The specific survey questions are detailed later in Table 1.

## 2.2 | Routine activity data

Patient activity data was obtained through the BNSSG System Wide Dataset<sup>11</sup> for all outpatient consultations provided by the Trust. Data was sourced over the 14-month period from September 2019 through October 2020 in order to establish a pre-COVID-19 baseline and to capture activity during and after the first wave (in which telehealth use intensified).

Data for 143,321 distinct outpatient consultations was available for analysis, obtained from the 20 highest-volume clinical specialities. All such specialities are covered by virtual consultations for which survey responses were obtained. The specific specialities are detailed later in Figure 1.

## 3 | RESULTS

The patient survey responses are summarised in Table 1 with the activity data, in terms of monthly outpatient consultation volumes by speciality, summarised in Figure 1. Additional data summaries used as part of this study are summarised within the Supplementary Material.

TABLE 1 Summarised data for patient surveys performed following virtual consultations (N = 2998)

Question	Response	Number	Percentage
Was this your first virtual consultation with the hospital?	Yes	2327	77.6%
	No	671	22.4%
Did you have any concerns when you were told you would be having a virtual consultation?	Yes	317	10.6%
	No	2667	89.4%
What device did you use for your virtual consultation?	Computer	1330	44.5%
	Tablet or iPad	465	15.5%
	Smartphone	1174	39.2%
	Other	23	0.8%
Beforehand, were you given all of the information you needed about the virtual consultation?	Yes	2876	96.4%
	No	106	3.6%
How was the process of booking the appointment?	Good or excellent	2608	87.7%
	Fair	89	3.0%
	Poor	36	1.2%
	Do not know	241	8.1%
How was the quality of the sound/picture during the consultation?	Good or excellent	2540	85.8%
	Fair	248	8.4%
	Poor	92	3.1%
	Do not know	79	2.7%
During the appointment I felt listened to	Agree or strongly agree	2374	97.5%
	Neutral	16	0.7%

TABLE 1 (Continued)

Question	Response	Number	Percentage
	Disagree or strongly disagree	7	0.3%
	Do not know	38	1.5%
During the appointment I felt involved in decisions about my care and treatment	Agree or strongly agree	2340	95.9%
	Neutral	49	2.0%
	Disagree or strongly disagree	13	0.5%
	Do not know	37	1.6%
During the appointment I felt able to communicate everything I wanted to	Agree or strongly agree	2359	96.6%
	Neutral	30	1.2%
	Disagree or strongly disagree	19	0.8%
	Do not know	34	1.4%
Overall, compared to having a physical appointment at hospital, did you find the virtual consultation?	Less stressful	1041	43.8%
	About the same	1093	46.0%
	More stressful	146	6.1%
	Do not know	98	4.1%
Did you prefer having your virtual appointment instead of physically at the hospital?	Prefer virtual	868	36.4%
	Prefer physical	641	26.9%
	No preference	800	33.4%
	Do not know	76	3.2%
After the pandemic is over, if there was a choice, would you prefer to continue virtual appointments or have physical consultations at the hospital?	Prefer virtual	590	25.0%
	Prefer physical	859	36.5%
	No preference	733	31.2%
	Do not know	173	7.3%

### 3.1 | From the patients' perspective

More survey respondents 'preferred' virtual (36.4%) than physical appointments (26.9%). When compared to physical appointments, seven times as many respondents found the virtual consultations 'less stressful' (43.8%) than 'more stressful' (6.1%). The vast majority of respondents felt both 'listened to' (97.5%) and 'involved in decisions about care and treatment' (95.9%). Yet of the 624 respondents who expressed a current preference for virtual over physical consultations, 103 (16.5%) would prefer physical consultations following the pandemic.

Regarding potential technical issues, patients who had previously attended at least one virtual consultation had less 'concerns' (6.8%) than those who had not (11.7%). One in five respondents were not aware of who to contact if they had a technical problem.

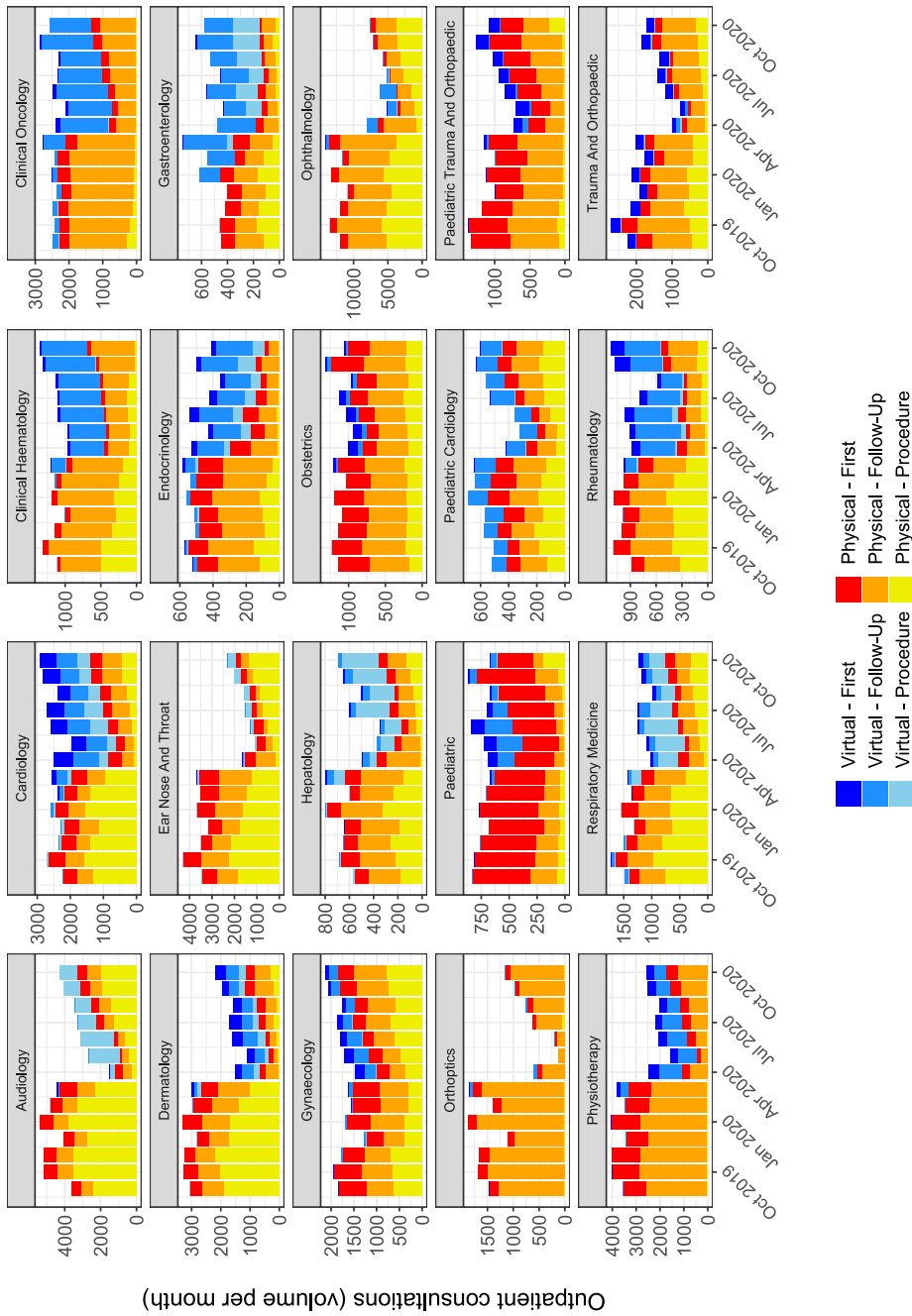


FIGURE 1 Outpatient activity per month by clinical speciality and consultation type [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

Four in five specialities showed no significant change in the overall number of consultations per patient during the first wave of the pandemic when telehealth services were widely implemented (Supplementary Material, Figure S1 and Table S1). Patients of three specialities (ophthalmology, orthoptics and endocrinology) experienced a greater than 2 week increase in mean time between consultations (Supplementary Material, Figure S2 and Table S1).

### 3.2 | From the healthcare system's perspective

Many specialities exhibited a significant decrease in physical appointments at the start of the first wave with virtual consultations increasing to replace the reduced activity (Figure 1). However, there was an uneven shift to virtual consultations between specialities for First, Procedure and Follow-up consultations. Three in five saw a greater than 5% decline in First consultations while slightly more (70%) saw equivalent decreases in Procedure activity. In contrast, half of specialities saw greater than 5% increases in Follow-up consultation activity.

Location and accessibility of healthcare services featured as important determinants for preference to virtual consultations, with free-text responses revealing 'waiting time' and 'travel time' to be the most-reported reasons. Contributory factors are highlighted by the presence of 'public transport' and 'car parking' within free-text survey responses.

## 4 | DISCUSSION

The results support the potential for telehealth technology to be rapidly employed across a multitude of clinical specialities (Figure 1) without negatively affecting overall reported patient experience (Table 1). Moreover, there is evidence to suggest that patients have favoured virtual consultations over those within hospitals. While some patients voiced concerns, this was substantially higher among individuals who had not previously received a virtual consultation, suggesting any preconceptions may be unfounded.

Regarding limitations it should first be noted that trends within the data will be associated with various effects of the pandemic, such as workforce availability and specific infection control measures which may disproportionately affect certain specialities. Second, while the activity data covered all patient contacts, the survey covered a cohort specifically selected upon perceived suitability. Not only does this lead to a likely overstatement of population preference to telehealth but it also excludes contacts which are deemed clinically inappropriate outside of the hospital setting. Third, unique patient identifiers (i.e., NHS numbers) were not available within the survey data and so it was not possible to link to primary care records in examining the effect of demographic or socioeconomic factors. Indeed, deprivation and ethnicity are previously recognised determinants of telehealth uptake.<sup>12,13</sup>

Further research could consider the maximal extent to which telehealth can be safely used across the various clinical specialities, based on the suitability of certain conditions to remote appointments. This will help managers understand where efforts to digitise outpatient services should be targeted. Linking survey and primary care data would support this, in identifying individual-level characteristics which associate with virtual or physical patient preference. Finally, in order to promote a better patient experience for those requiring physical consultation, further work could investigate ways for hospitals and councils to alleviate any travel-time burden. This could entail improved public transport options or the scheduling of appointments outside of peak travel times.

## 5 | CONCLUSIONS

This study found that virtual outpatient consultations can be rapidly implemented across a breadth of clinical specialities and with generally positive patient experience, thus highlighting the potential for telehealth in the diversification of outpatient services. In combining both patient survey and routine activity data, this study demonstrates the importance of using information from multiple sources to derive detailed insight.

### ACKNOWLEDGEMENTS

The authors acknowledge the contributions of Catlin Bateman, Mitchel Gladwin, Puzhen Jiang, Marisa Kegg, Julie Marshal, Mark Price and Elizabeth Williams. No specific funding was received for this study.

### CONFLICT OF INTERESTS

The authors report no conflict of interests.

### ETHICS STATEMENT

This study has used anonymised routine health data and has not made use of any patient or person identifiable data

### DATA AVAILABILITY STATEMENT

Data is not available due to patient confidentiality.

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### SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

**How to cite this article:** Tyler JMB, Pratt AC, Wooster J, Vasilakis C, Wood RM. The impact of increased outpatient telehealth during COVID-19: retrospective analysis of patient survey and routine activity data from a major healthcare system in England. *Int J Health Plann Mgmt.* 2021;36(4):1338-1345. <https://doi.org/10.1002/hpm.3185>