



# Accurx Self-Book

Evaluation Report

# Working in collaboration with



Prova Health is an evaluation and analytics company, specialising in the adoption of digital health technology. Unity Insights and Prova Health have collaborated closely to provide this evaluation report.

**Kent Surrey Sussex  
Academic Health Science  
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Kent Surrey Sussex Academic Health Science Network (KSS AHSN) is one of fifteen AHSNs working to transform lives through innovation.



The NHS consists of various organisations working together to provide a variety of health and care services for patients and carers.

# Contents

	1
<b>Executive summary</b>	<b>6</b>
Context	6
Self-Book Activity	6
Key results	6
Recommendations	7
<b>1. Introduction</b>	<b>8</b>
1.1. Purpose of the report	8
1.2. Context	8
1.3. Accurx Self-Book	9
<b>2. The Evaluation</b>	<b>9</b>
2.1. Qualitative summary	9
2.2. Quantitative summary	10
<i>Health Inequalities</i>	10
2.3. Health economic summary	10
<b>3. Methodology</b>	<b>11</b>
3.1. Qualitative Analysis	11
<i>Data Collection</i>	11
<i>Analysis Methodology</i>	12
3.2. Quantitative Analysis	12
<i>Health inequalities</i>	13
3.3. Health Economic Analysis	14
<i>Benefit Streams</i>	15
<i>Unmodelled Benefits</i>	16
<i>Scenario Analysis</i>	17
<b>4. Results</b>	<b>18</b>
4.1. Qualitative Findings	18
<i>Practice Sample</i>	18
<i>Survey Responses</i>	21

	<i>Patient Satisfaction</i>	27
	<i>Staff satisfaction</i>	27
	<i>Time Saving</i>	29
	<i>Digital Barriers</i>	38
4.2.	Quantitative Findings	39
	<i>Self-Book uptake</i>	39
	<i>Self-Book usage</i>	41
	<i>Health Inequalities</i>	44
4.3.	Health Economic Results	47
	<i>Scenario 1 – PCN</i>	47
	<i>Scenario 2 – ICB</i>	49
	<i>Scenario 3 – National</i>	50
<b>5.</b>	<b>Discussion</b>	<b>52</b>
	<i>Self-Book is used for a variety of use cases</i>	52
	<i>Benefits for practices</i>	52
	<i>Self-Book has led to significant time saving for practices</i>	53
	<i>Self-Book has improved efficiency in practices</i>	54
	<i>Economic Benefits</i>	55
	<i>Patients had a positive experience of Self-Book</i>	55
	<i>Self-Book may enable access to primary care</i>	56
	<i>Health Inequalities</i>	56
<b>6.</b>	<b>Limitations</b>	<b>58</b>
	<i>Time since launch of Self-Book</i>	58
	<i>Selection bias</i>	58
	<i>Limitations in comparing to GPSS results</i>	58
	<i>Limitations with Likert scales</i>	58
	<i>Health Economic Assumptions</i>	59
<b>7.</b>	<b>Recommendations</b>	<b>59</b>
7.1.	Further analysis	59
7.2.	Development of case studies / best practice	60
7.3.	Further development of the platform	60
<b>8.</b>	<b>Concluding remarks</b>	<b>60</b>

<b>9.</b>	<b>References</b>	<b>62</b>
<b>10.</b>	<b>Appendix</b>	<b>64</b>
10.1.	Appendix A: Health economic details	64
	<i>Net present value</i>	64
	<i>Benefit streams</i>	64
	<i>Optimism bias</i>	65
	<i>Sensitivity analysis</i>	67
10.2.	Appendix B: Practice Sample	71
10.3.	Appendix C: Survey	72
	<i>Survey Questions</i>	72
	<i>Survey Results</i>	75
10.4.	Appendix D: Interview Guide	78

# Executive summary

## Context

Launched in September 2022, Self-Book by Accurx is intended to support practices to schedule and book appointments online, without the need for phone calls to facilitate the process. Practices can offer patients a range of appointment slots to choose from through a link sent directly to the patient.

The intervention seeks to help address growing pressure within Primary Care and declining patient satisfaction with access to GPs. By offering patients the opportunity to select a time and day that suits their needs, it is hoped that patients will find it a convenient solution.

Prova Health and Unity Insights have been commissioned to undertake a mixed-evaluation into the impact of Self-Book in practices. Prova Health led on the qualitative workstream of the evaluation, delivering interviews and surveys to assess the perception of the system from both patients and staff. Meanwhile Unity Insights has undertaken a quantitative assessment of the system's uptake, while performing analysis of the economic impact of the system.

## Self-Book Activity

Following the launch of the system, over 46% of practices nationwide have utilised the system to some degree, with around two-thirds of these having sent more than 1000 messages via Self-Book by the end of December 2022.

The launch of Self-Book coincided with the delivery of the autumn vaccination campaign for Flu and COVID and it is not a surprise that many early adopters of the batch-messaging functionality used the vaccination campaigns as the primary use-case. To-date over 75% of links sent through Self-Book have related to Flu and COVID.

Usage has been varied, however, with practices using the system to manage long-term conditions and routine appointments, such as blood tests. A growing number of practices are also using Self-Book to book direct appointments with a month-on-month growth in the number of individual links observed since launch.

## Key results

### Practice efficiency

Participants reported a range of benefits to both practices and staff. All staff interviewed stressed the time-saving benefits of Self-Book, which enabled them to deliver more as a result. Staff also reported lower levels of stress and higher job satisfaction.

*“It makes you feel like you've done a good job and you've not got that pressure of ‘there's 10 other people who you haven't had this same conversation with’.”*

Even with a minority of activity taking place via Self-Book, participants felt that the system had helped reduce time spent on the phone. Practices felt the benefit of this time-saving in a number of ways, with the system supporting active management of routine appointments and long-term conditions.

*“It [Self-Book] helps us fill in appointments now... If we have any empty ones, then we just use Self-Book... I send 50 messages and by next morning when I come in, the nurses have a nicely filled clinic.”*

### **Health economic outcomes**

Across all evaluation workstreams, it appears that Accurx’s Self-Book facility is likely to provide value to primary care once it is an established part of operating processes. At this stage, not all benefits can be modelled and so benefits stated are the minimum expected. Analysis on these few potential benefits suggests that the time saved through a streamlined booking process supports greater efficiencies throughout adopting organisations. Benefits at a PCN level were estimated to total £105,000 over a five-year period, while this rises to £3.19 million when applied at an ICB level and £123.1 million nationally. The included benefits are expected to be primarily experienced by the practices themselves.

### **Patient acceptability**

Responses to the patient survey found that the majority of respondents had a positive experience with using Self-Book. When booking vaccination appointments, 82% of respondents found the experience of making an appointment very good or fairly good. 77% of respondents also found making an appointment through Self-Book easier or much easier than calling their GP.

Most patients (68% for vaccine appointments, 62% for other appointments) responded that they would use Self-Book again, and that they would recommend using the service to a friend or colleague (61% and 55%, respectively).

## **Recommendations**

### **Further Analysis**

While the core benefits streams included within the health economic analysis are not directly cash-releasing, feedback from practices have hinted at a variety of potential cash saving benefits that may result from the resulting efficiency. Future evaluation should be considered to track the impact of the service over a longer timeframe, observing the impact of the system upon Quality Outcomes Framework (QOF) attainment and long-term condition management.

### **Development of Case Studies**

Through the evaluation’s engagement with GP practices, it arose that different organisations had adopted the system into their workflow in different ways. This variation may result in varying experience in terms of the benefit experienced. It is recommended that Accurx seek to identify best practice and support the sharing of knowledge across organisations, through the publication of case studies.

Across the evidence gathered in support of this mixed-methods evaluation there is a lot of positive feedback in relation to the impact Self-Book can have within practices. It is still a young system and an understanding of the full benefits will no doubt develop over time. Ultimately, it appears that the system is successful in delivering the intended benefits to practices, reducing the time required to schedule appointments and releasing pressure upon the primary care system.

# 1. Introduction

## 1.1. Purpose of the report

Unity Insights and Prova Health have been commissioned in partnership by Accurx to conduct an evaluation into the impact of the Self-Book service on general practices, staff and patients. This report presents the results of qualitative, quantitative and health economic analyses. Both the quantitative analysis and health economic modelling of the Self-Book service were conducted by Unity Insights. The qualitative data collection and analysis were completed by Prova Health. The incorporation of all findings in this report was a joint responsibility of Unity Insights and Prova Health.

## 1.2. Context

Primary care is the lynchpin of healthcare services - providing care and support to over one million individuals every day and frequently acting as the first point of contact for those requiring health-related advice or treatment (Fuller, 2022). Despite its importance, primary care faces several pressures which are subsequently affecting both staff and patients. A notable challenge is the double threat of declining GP numbers and increased patient numbers, whereby there are now only 0.44 fully qualified GPs per 1,000 patients in England (0.08 decrease since 2015) and the average number of patients assigned to a GP standing at 2,273 (17% increase since 2015) (The British Medical Association, 2023). The simultaneous GP shortages and increased patient numbers highlight the unmanageable workloads faced by staff, likely leaving no available capacity. With a rapidly shrinking and exhausted workforce, the risk of GPs becoming burned out is increasing (The British Medical Association, 2023). In addition to affecting staff, these pressures have also resulted in increased discontent with primary care by the public (Fuller, 2022), with the overall patient satisfaction decreasing by 17% by 2021 from 2020 to 36% - the lowest satisfaction score since 1997 (Wellings, et al., 2022). This could be the result of increased difficulty accessing care, with practices having recently come under pressure to increase the proportion of appointments that take place in-person to pre-pandemic levels.

In order to manage the mixture of remote and face-to-face appointments, along with the associated administrative demands, Primary Care organisations procure digital technology that can help staff manage, triage and schedule patients from a variety of sources. These include online consultation systems, video and telephony solutions and bulk-messaging programmes, along with a range of other functions.



## 1.3. Accurx Self-Book

Accurx is a software company offering a digital platform which supports integrated communication across the health and care system (Accurx, 2023). This facilitates healthcare teams and patients to connect with each other and additionally allows NHS professionals to manage their patient care and communication. This is delivered via a range of modes, including functionality to message patients, send patient questionnaires, conduct online consultations and video consultations, deliver appointment reminders, and enable communication between providers. In addition, Accurx is now providing its products to secondary care organisations, where 'waiting list validation' is an additional focus area.

More specifically, Accurx have produced a Booking Module, including 'Self-Book' and 'Batch Self-Book' features, which aims to invite patients to book their own appointments for specific slot types, rather than require a call with practice staff to find an appropriate time. This works by providing an appointment booking link to specific patients sent by the GP either as an individual or batch message, the patient then chooses an appropriate time and date for their appointment and the booking is then integrated into the underlying GP IT system, such as EMIS or SystmOne (Accurx, n.d.).

The Self-Book function was officially launched on 1<sup>st</sup> September 2022, with the introduction of batch messaging capability. Prior to this, individual Self-Book for phone appointments only had been included in the Accurx Patient Triage module. The launch coincided with the autumn vaccination campaign for Flu and COVID, leading to many practices utilising the platform to support these campaigns.

# 2. The Evaluation

## 2.1. Qualitative summary

Qualitative data aims to demonstrate the potential benefits of Accurx's Self-Book by adding a richer narrative to the quantitative analysis. The following areas will be sought to be evaluated wholly or partly using qualitative techniques (short patient survey and semi-structured interviews with staff), the extent of which will depend on engagement and the availability of data.

- Satisfaction – patient and staff
- Practice time saved
- System efficiency
- Improved health outcomes

- Health care associate experience

## 2.2. Quantitative summary

To understand the uptake of Self-Book across the system, the usage of Self-Book by practices (slot type and slot category) and how this has changed over time. To achieve this, Self-Book usage data from Accurx was analysed focusing on the following variables:

- Total links sent
- Type of link sent (i.e., batch or individual message)
- Total appointments booked
- Scheduled timeslot type (i.e., face-to-face, or phone)
- Scheduled timeslot categorisation (i.e., clinical purpose)

### Health Inequalities

Further analysis of quantitative data seeks to observe the variation in impact in terms of local demographics and potential health inequalities, as well as the factors that appear to have an association with the likelihood of patients using the Self-Book system to arrange appointments. A statistical analysis of the cohorts within the resident populations that have engaged with the service will inform assessments of where communities may not be engaged by the system. This is intended to provide an insight into whether the system helps address inequality of access, and which cohorts may require a traditional booking method.

Feedback will also be sought through qualitative enquiry to discuss the perception from the perspective of practice staff, whether the system has had any unintended consequences in terms of digital exclusion.

## 2.3. Health economic summary

A health economic analysis was produced to provide an estimation of the benefits Self-Book could yield to practices and the healthcare system. Two benefit streams were identified and modelled:

- Reduction in phone calls to practice
- Reduction in DNAs

The methodology of the model, including a description of each benefit stream calculation and the sources used to construct these, are presented in section 3.3.

Alongside the analysis, a Monte Carlo sensitivity analysis of the results was conducted to simulate potential variance in the identified outcomes.

# 3. Methodology

## 3.1. Qualitative Analysis

### Data Collection

#### *Semi-structured Interviews*

An interview guide (Appendix D: Interview Guide) was created using expert input from three GPs. The questions were focused on the themes identified in the original benefit streams.

Interviews were conducted using the guide, and more focused questions were asked where participants raised interesting and relevant themes. Three closed questions were used to allow the quantification of specific topics:

- “Has Self-Book saved your practice time?”
- “Has Self-Book improved access to primary care for your patients?”
- “Would you recommend Self-Book to other practices?”

Participants who volunteered to participate were sent a Participant Information Sheet (PIS) and were asked to return a signed consent form before each interview. The interviews were conducted online using Google Meets and recorded for transcription. The interviews lasted between 30-45 minutes.

#### *Patient Survey*

The survey was separated into two sections according to why a patient had used the service. These sections were “Vaccination” and “Other GP Appointment”. The latter includes batch-use of Self-Book for non-vaccination use cases and ad-hoc appointments. The survey was provided to participating practices, with the instruction to issue to Self-Book patients.

Questions focused on patient satisfaction with using Self-Book. It also captured feedback on how patients perceived access to care before and after using Self-Book. Likert scales were used to gather information about patients’ opinions, attitudes and perceptions of care and appointment booking, and are a validated measure of capturing psychometric information (Clark & Watson, 2019; Jebb, Ng, & Tay, 2021).

Due to the variation in patient selection methods for each site, it was not guaranteed that all patients who received the survey had used Self-Book. To account for this, an option was given to patients to respond to the survey indicating that they had not used Self-Book. This also allowed patients who had received a Self-Book link, but opted not to use it, to respond and state a reason as to why they didn’t use Self-Book. These responses were reviewed, to understand the reasons provided, but excluded from any questions relating to the experience of using the system itself.

## ***Sample***

A convenience sample was used to recruit general practice surgeries for the evaluation. Practices were approached for the evaluation according to their usage of Self-Book. The top 106 practices in terms of bookings made were contacted via email. Those that expressed an interest in taking part were then onboarded individually. Early access to Self-Book features was used as an incentive.

Receptionists, Practice Managers and GPs were identified as key staff stakeholders for Self-Book. These three groups of staff were selected for the interviews as they would be the primary users of the platform in GP practices.

A minimum threshold of two stakeholders per group was set. This met the minimum requirement of five participants needed to gain credible qualitative insights (Nielsen & Landauer, 1993; Macefield, 2009; Davies & Mueller, 2020).

In total, 106 sites were contacted via email. From these, 14 sites responded offering to participate in the survey. Ten staff members from seven practices agreed to participate in interviews.

Significant variability in business rules, retrospective data access, and different use cases of Self-Book meant that patient sample selection for the survey varied considerably between practices.

## **Analysis Methodology**

### ***Interviews***

A thematic analysis was performed on the interview transcript data. Themes were identified using the originally proposed benefit streams as a basis. Sub-themes were identified within these. The transcripts were coded initially using descriptive codes and these codes were grouped into conceptual themes.

### ***Survey***

Questions using a Likert scale were plotted as divergent stacked bar charts to reflect the spread of responses. Positive (Good and Very Good) and negative (Bad and Very Bad) answers were combined to allow results to be interpreted more clearly. Patients who responded “Other” to the question regarding why they didn’t use a Self-Book link were able to leave a free-text response. These were coded in the grouped themes.

## **3.2. Quantitative Analysis**

Quantitative analysis was performed to understand the uptake of Self-Book by practices and the comparative success of different forms of messaging. This was captured using practice-level data sourced from Accurx which included dates, the total number of links sent, the total number of links book, slot type (i.e., batch or individual) and slot categorisation (use case). To note, where presented at national and a Kent Surrey Sussex (KSS) perspective, data is adjusted for population

size, using figures used obtained from the February 2023, “Patients Registered at a GP Practice” data series publication from NHS Digital (NHS Digital, 2022). Kent Surrey Sussex Academic Health Science Network (KSS AHSN), an NHS-commissioned organisation that is intended to support the deployment of innovative systems within the NHS, has been engaged as part of this evaluation and therefore has been included in some elements of the quantitative analysis.

To investigate engagement with Self-Book and uptake across the system, the number of practices that had sent over 1000 links was explored. Furthermore, a time series was created to visualise how the number of links sent and the number of links booked changed over time. This was explored and presented at a national level.

In addition to uptake, the usage of Self-Book was explored in order to understand how practices were using Self-Book (i.e., through batch or individual links) and for what type of appointments (i.e., the use cases). This involved creating additional time series to compare the number of batch links booked and the number of individual links booked. Where appropriate, given the nature and scale of the data, analysis was stratified further by use case. Moreover, booking rates were compared between link type and use case where necessary to understand whether uptake depended on either of these factors.

## Health inequalities

Comparative analysis has been undertaken to understand whether demographic factors have an association with the likelihood of patients using the Self-Book system to arrange appointments. The demographics explored were aggregated at practice-level and included:

- Access to Primary Care (measured by the number of GPs per 100k in the registered population)
- Proportion of registered population over the age of 65
- Proportion of registered population over the age of 80
- Lower Internet Usage Classification (IUC)
- Weighted Average Index of Multiple Deprivation decile for the registered patient population.

A combination of sources was used to identify the demographics for practices across the country, primarily NHS Digital’s Patients Registered at a GP Practice dataset, (NHS Digital, 2022). This dataset provides age demographics for each GP Practice in the country, while also supplying a geographical perspective, in the form of patients registered by Lower Layer Super Output Area (LSOA). An LSOA is a geographical area defined by the Office of National Statistics, usually comprising between 400 and 1200 households. As many other government datasets are produced at this level, analysts are able to derive a more granular overview of the region a GP Practice, or other organisation, serves.

Another external dataset delivered at LSOA level that has been utilised for analysis is the Consumer Data Research Centre’s (CDRC) Internet User Classification (CDRC, 2019). This 2019 dataset provides a geographical assessment of digital maturity across England. The dataset

divides the population into ten groups, indicating the digital skillset of the local population. As the dataset refers to a pre-pandemic population, the data has been grouped into a binary position to provide a proxy measure. Three cohorts have been grouped into “Lower digital usage than average” (“e-Withdrawn”, “Passive and uncommitted users”, and “Settled offline communities”). The remaining seven groups (“Digital seniors”, “e-Cultural creators”, “e-Mainstream”, “e-Professionals”, “e-Rational utilitarians”, “e-Veterans” and “Youthful urban fringe”) were taken as representing “higher digital usage than average”. The composite proportion of patients in each of the two groups was calculated for each practice to support analysis.

A similar approach was taken to support analysis of engagement in the context of deprivation. The English Index of Multiple Deprivation (IMD) combines seven domains of deprivation into a single position for each LSOA nationwide (Ministry of Housing, Communities & Local Government, 2019). These data are presented as rankings and, more commonly, as deciles, to provide an insight into the relative deprivation residents of the LSOA may face. When aggregated to a practice level, the number and proportion of patients living within each decile can be assessed. For the purposes of statistical analysis these data have been reduced to a single weighted average. To calculate this, the population within each decile was multiplied by the decile rank (i.e., 1000 individuals within the fifth decile would be assigned a value of 5000), before all being added together and then divided by the total number of patients registered to the practice in question. The result of this process is a single weighted average position for the local population.

Demographic data were arranged by practice, PCN, ICB and National levels to support analysis. Each metric at a practice level was compared against Self-Book booking rates (i.e., the percentage of Self-Book links that resulted in a booking) to provide an insight into the association between each demographic factor and the likelihood of higher or lower engagement in terms of bookings. This is a basic form of linear regression, performed using existing models within Tableau, used to explore the factors that may have affected engagement to-date. These analyses were repeated for all links sent through Self-Book, regardless of use-case, as well for all links excluding those related to Flu and COVID vaccination programmes. All sites that had sent under 1000 links through Self-Book were excluded from analysis.

### 3.3. Health Economic Analysis

A health economic model was built using a combination of existing literature and data from the project itself. Data was provided by Accurx relating to usage of the Self-Book system up to 16<sup>th</sup> December 2022, this was analysed in combination with publicly available data, literature sources and directly collected directly from participating GP Practices.

The general methodology followed is principled on the Green Book Treasury (HM Treasury, 2022) approach and adapted to adjust for real world considerations and forecasting. More details on the general health economics approach used here can be found in Appendix A: Health economic details. Specific aspects of the modelling process in relation to this programme are laid out below.

All scenarios consider universal adoption by practices within the geography defined by each scenario. All practices are assumed to be an established user of Self-Book experiencing benefits, as observed through the real-world evidence relating to current users.

## Benefit Streams

### *Reduction in phone calls*

One of the core potential benefits of Self-Book this evaluation sought to observe was that the provision of a system to efficiently engage patients to schedule appointments, while allowing patients to select a time and date convenient to them, would have an impact on the number of call practices would have to field. This was a view echoed by Practices participating in the evaluation, both to Prova Health, and to Unity Insights when discussing potential data sources.

Messages were sent to more than a hundred established Self-Book users to gather evidence of the impact upon practice processes. Sixteen practices responded and participated in conversations regarding the perceived impact of the system and potential data availability. Unfortunately, only a minority of these were able to extract phone record data in a format that could be used to draw comparisons between pre- and post-Self-Book activity. Enough feedback was provided to establish the time spent by practices on calls scheduling appointments, and to validate the assumption that an appointment scheduled through Self-Book was seen as a call saved.

The Net change in the number of booking calls was calculated through analysis of Accurx’s own usage data, and NHS Digital’s Appointments in General Practice reporting (NHS Digital, 2022). The NHS Digital report provided an insight into the number of appointments held by each practice between October 2022 and December 2022. This data was compared to Accurx usage data to establish the proportion of total appointments scheduled via Self-Book for practices that were established Self-Book users (i.e., had issued more than 1000 links through the system). The resulting proportion (2.23%) was extrapolated to an annual number of appointments, incorporating seasonal variance in General Practice activity.

GP Practice data provided to the evaluation team was used to establish the average duration of a call (2.28 minutes), while the cost of a call was a combination of data taken from Unit Costs of Health and Social Care 2022 (PSSRU, 2022) and industry estimates of the average cost of a call per minute across IP telephony systems.



**Figure 1: Reduction in phone calls to practice benefit stream calculation.**

## Reduction in DNAs

The underlying assumption for this benefit stream was that, as patients would have greater control over the scheduling of their appointments, it is expected that the attendance rate of patients will increase, reducing waste to the system. This represents a clear potential cost reduction to practices.

Data was provided by nine GP practices relating to appointment rates and the proportion of Did Not Attends (DNAs) recorded. To measure this benefit stream, the DNA rates of equivalent periods, before and after the introduction of Self-Book, were analysed to understand the year-on-year effect that can be observed. While overall, DNAs did increase year-on-year, through comparison against NHS Digital data for the Sub-ICBs of each participating practice, a trend was recognised that the growth was lower than observed outside of the evaluation group.

This impact upon DNA rates provided the net change in DNA rate, which was the applied to Self-Book booking rates in the same manner as the previous benefit stream. The cost of a DNA was similarly taken from PSSRU's Unit Costs of Health and Social Care.



Figure 2: Reduction in DNAs benefit stream calculation.

## Unmodelled Benefits

Due to the early stage of deployment and the data provided to-date, it is important to recognise that there are likely to be further benefits of Self-Book, which at this stage cannot be modelled. Although reduction in phone calls to the practice is included as a benefit stream, further efficiency savings resulting from this are not modelled. Notably, reduced phone calls provide support to staff in managing their work demand as it requires fewer staff resources per appointment booking and enables time to be saved. Consequently, staff can streamline their recall process and / or complete other tasks. This has benefits including increasing the likelihood of achieving QOF targets and positively impacting staff through reduced stress levels and improved job satisfaction.

Other unmodelled benefits of Self-Book include improved clinical utilisation which allows unused appointments to be booked closer to the allocated timeslot than what was previously possible. Moreover, this facilitates a reduction in wastage such as disposed vaccines. Finally, at this stage, the model is also unable to capture patient benefits. This includes improved patient experience and satisfaction which are likely to result from reduced time in phone queues and improved access to care.



Further benefit streams were considered but could not be incorporated into the model due to a lack of data available to effectively monetise the data, or due to variation identified between participating GPs, making it difficult to understand how consistently the benefits would be experienced by organisations.

### System Savings (COVID)

One benefit stream which was considered, but not ultimately included, relates to a potential association between Self-Book utilisation and vaccine uptake. Quantitative data was analysed to assess an overall increase in vaccinations uptake based on the local delivery to over 50s. This analysis primarily utilised NHS England’s Weekly COVID Vaccination delivery data (NHS England, 2022). Due to changes in the reported dataset, the proportion of over-50s that had not received the vaccination was compared on 1<sup>st</sup> September 2022, and 5<sup>th</sup> January 2023 to derive an overview of the success of the vaccination campaign. A marginal increase was found, indicating a net increase in the number of vaccines delivered.

The benefit to the system was assessed using a combination of sources. The National Audit Office report into vaccine delivery in England, which provided the costs per vaccine delivered and indicative costs for the vaccines themselves (National Audit Office, 2022). These were contrasted with a cost-benefit analysis of the vaccines performed in an EU setting, which indicated a benefit-to-cost ratio of 1.4 per vaccine delivered (Lopez, 2021).

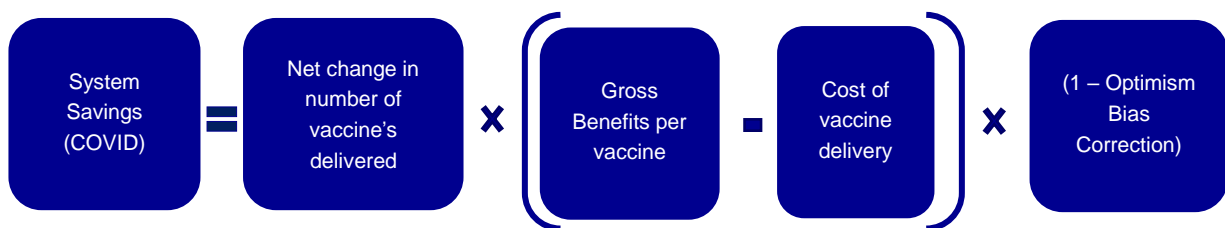


Figure 3: System savings (COVID) benefit stream calculation.

The measurement basis for this benefit stream is drawn from the best available data but is limited by the absence of clear reported data capturing the number of hospital episodes saved in a scalable format that could be applied to the model. Due to the reliance on cost-benefit analysis performed on vaccine delivery, and the small increase in vaccine delivery, this benefit stream was believed to be understated and also drawn from correlative data, rather than clear causal evidence, and was therefore withdrawn from the model.

### Scenario Analysis

Three different scenarios were modelled to estimate:

1. The impact of Self-Book on a single PCN
2. The impact of Self-Book at ICB level
3. The impact of Self-Book nationally

The benefit stream calculations outlined above are indicative of the first scenario. The main difference between the first scenario and the other scenarios is the target population, which increased as the scenarios progress. The average PCN and ICB population size were calculated and used for scenario one and two respectively, and the national population size was used for scenario three.

Variables relating to population as well as population size included appointment rate (i.e., the mean number of appointments as a percentage of the population total), the number of bookings made using Self-Book, and lastly the number of messages sent via Self-Book. For each population variable, bar the appointment rate which are assumed to remain constant within each scenario, assumes a 'UK population (mid-year) – growth rate' across the 5-year estimates in the model.

## 4. Results

### 4.1. Qualitative Findings

#### Practice Sample

##### *Practice demographics*

Initially, 106 practices were contacted via email, of which 54 expressed their interest in participating in the survey and interviews. As a result, 14 practices agreed to send out surveys, generating 1,616 responses overall. Seven sites agreed to participate in the semi-structured interviews. The practices were spread across different regions.



Source: ONS Open Geography Portal, ONS

**Figure 4: Geographical location of sample practices.**

The practices in the sample had a mixed satisfaction rating in the annual GP Patient Survey (GPSS) (NHS England, 2022). Ten of the survey practices were distributed below the national average satisfaction scores and nine scored higher.

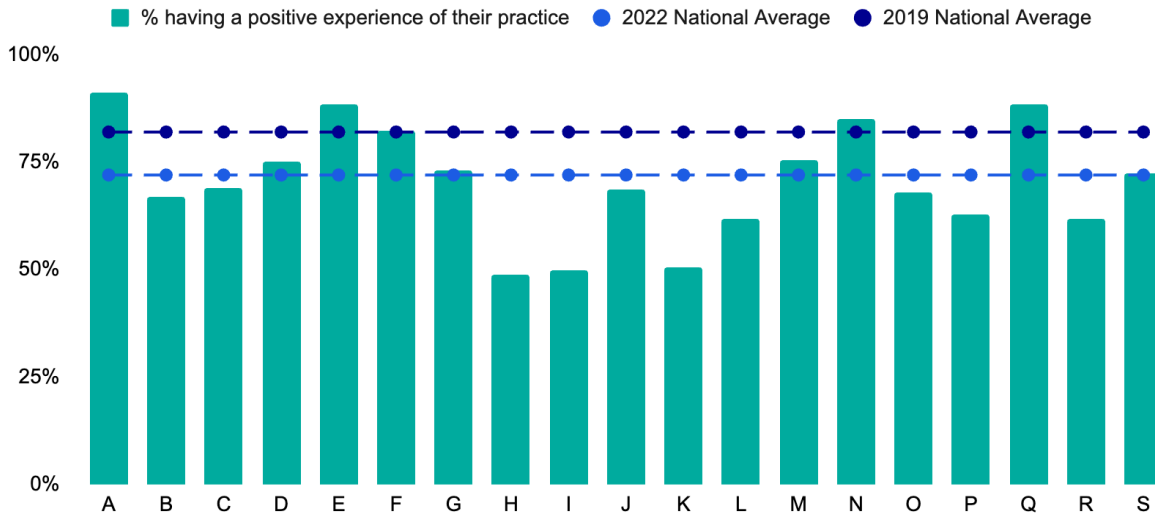


Figure 5: GP Patient Survey Results for sample practices and national average score for 2022 and 2019.

### Booking rate / Cohort Selection

Practices selected cohorts of patients who may have received a Self-Book link. This selection process varied between practices as each had different abilities to access these lists of patients retrospectively. The majority selected a cohort of patients in specific disease areas (i.e., asthma, diabetes) or immunisation cohort (i.e., Flu and COVID immunisations). This was as these patients may have received a Self-Book link as part of their annual recall.

A total of 14,188 surveys were sent to patients. From these, 1,616 survey responses were received. The response rate varied between practices, as shown in the chart below, with practice H achieving the highest response rate at 18% and practices A and N achieving the lowest response rates at 4%.



n=1616

Figure 6: Survey response rate for each practice and total number of surveys sent.

### Interview stakeholders

Ten staff members were interviewed from these practices, providing valuable insights into the usage and impact of Self-Book on their workflow. How these staff members were distributed across practices is displayed in Table 1. The interview responses offered a deeper understanding of how the patient experience was impacted by using the platform and how it has changed practice workflows.

Table 1: Number of stakeholders interviewed at each site.

	GP	Practice Manager	Receptionist
Practice A		1	1
Practice M			1
Practice O	1	1	1
Practice P	1		
Practice Q		1	
Practice R		1	
Practice S		1	

## Interview Themes

The five primary themes identified from staff interviews were patient satisfaction, staff satisfaction, time saving, improved efficiency and digital barriers. Each theme provides insight into how Self-Book impacted healthcare delivery at the sites participating in the evaluation.

**Table 2: Themes identified during interviews (n=number of participants stating a theme).**

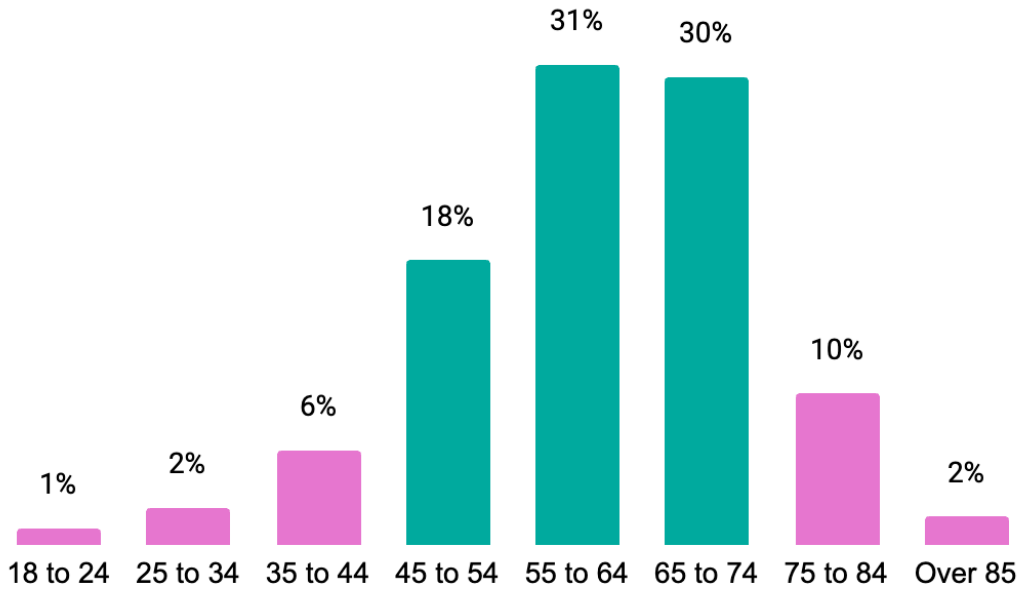
Theme	n	Sub-theme	n
Patient Satisfaction	10	Modern way of accessing GP	4
Staff Satisfaction	10	Improved ways working	10
		Reduction in stress	4
		Improved job satisfaction	4
Time Saving	10	Reduced call length for appointment bookings	10
		Reduced incoming call volume to the practice	10
Improved Efficiency	10	Improved ability to plan recalls	6
		Streamlined appointment booking process	10
		Assurance	10
		Upskilling of reception Staff	2
		Reduced unused capacity	4
Digital Barriers	10	Self-Book benefits non-English speaking patients	5
		Self-Book can improve access for elderly patients	10

## Survey Responses

Of the 1,616 survey responses, 867 (54%) had previously used the Self-Book platform and 749 (46%) stated they had not used Self-Book. For those who had used Self-Book, 609 responded that they had booked a COVID or Flu appointment via Self-Book. A small number of respondents (258) had used the platform to book another type of GP appointment.

As depicted in Figure 7, there was a variation in survey respondents by age. The majority of survey respondents were between the ages of 45 and 74.

The positive and negative responses have been combined into two aggregate responses for each question to allow easier interpretation. For example, *Good* is a combination of *Very Good* and

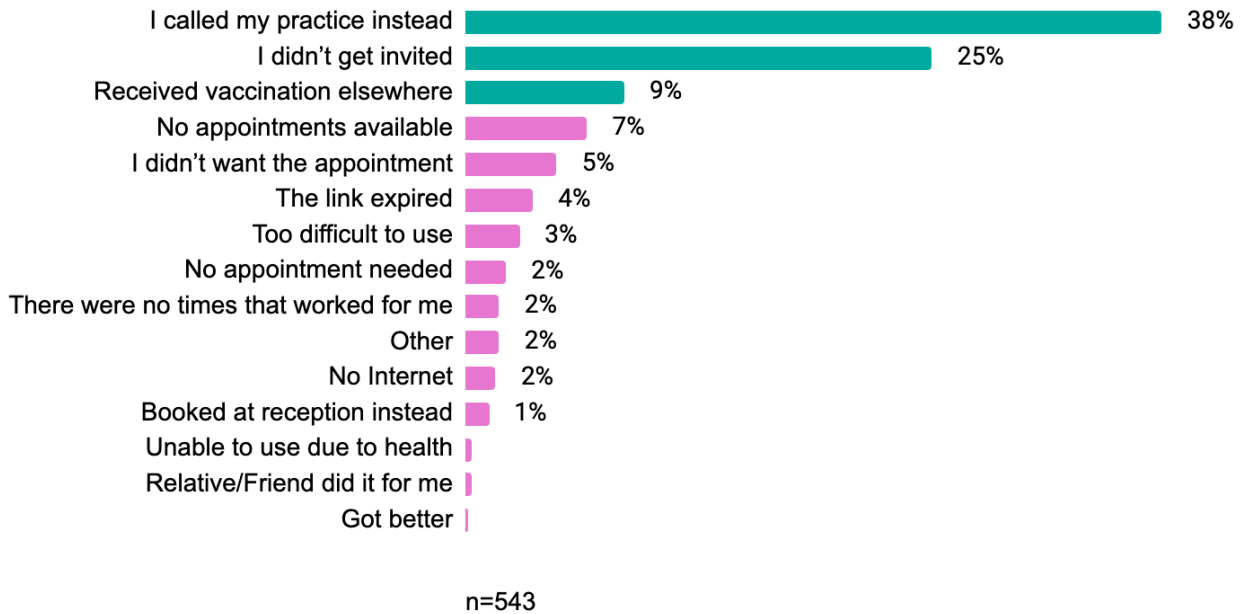


*Good*, and *Bad* is a combination of *Bad* and *Very Bad*. The raw responses can be seen in Appendix C: Survey.

**Figure 7: Age distribution of survey respondents.**

### Patients who did not use Self-Book

Of the 749 respondents that didn't use Self-Book, 543 stated a reason for not using the service (Figure 8). A majority of these (38%) opted to call the practice instead. A quarter (25%) said that they did not get an invite. This is likely due to the variation in cohort selection methods used by the practices. Therefore, they may not have been given the opportunity to use Self-Book. Patients that did not use the system were excluded from analysis of responses relating to the experience of using Self-Book.



**Figure 8: Reasons for not using Self-Book as reported by survey respondents.**

Nine percent of respondents invited for immunisation using Self-Book had already received their vaccination at another provider (i.e., a local pharmacy) and hence did not need the appointment. Capacity issues external to Self-Book meant that seven percent of respondents found no appointments available when attempting to book online.

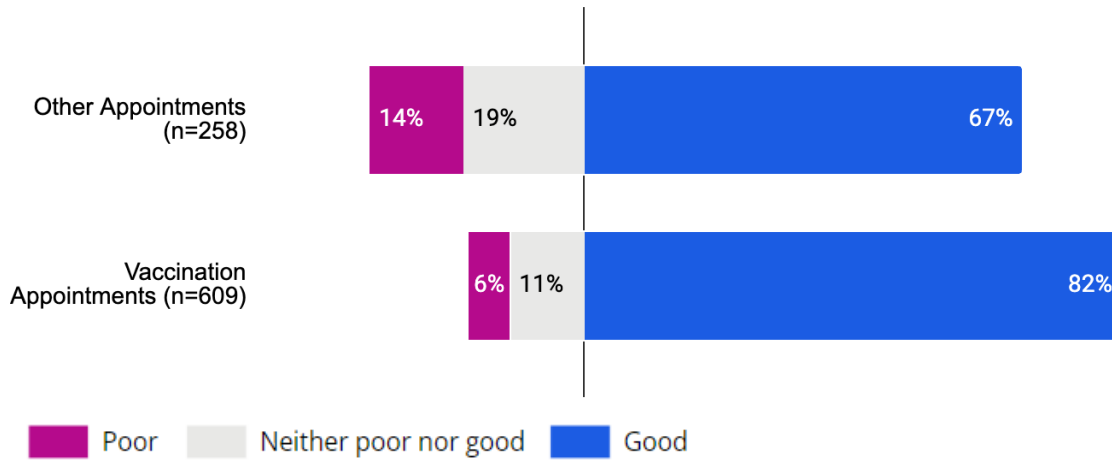
### Patient satisfaction

#### A majority of patients found it easy to use Self-Book

The majority of respondents had a positive experience with using Self-Book. When booking other appointments, 67% of respondents found the experience of making an appointment using Self-Book very good or *fairly good*, 19% found it *neither good nor poor*, and 14% found it *very poor* or *fairly poor*.

When booking vaccination appointments, 82% of respondents found the experience of making an appointment using Self-Book very good or fairly good, 11% found it neither good nor poor, and only 6% found it *very poor* or *fairly poor*.

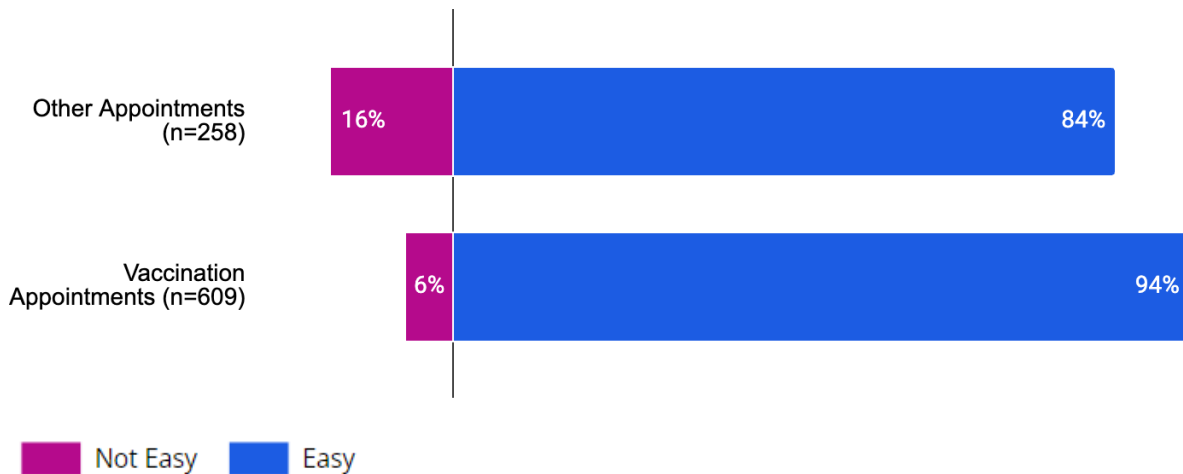
Notably, a higher proportion of vaccination respondents responded positively compared to other appointment types. This likely reflects the other factors that impact access to GP appointments, including capacity and patients' expectations of appointment type and available times. Frustrations with the lack of appointments and face-to-face consultations were apparent in some of the free-text responses received.



**Figure 9: Survey responses to the following question, “Overall, how would you describe your experience of making an appointment using the online booking service?”.**

A significant majority of respondents found Self-Book easy to use in both groups. When booking Other Appointments using Self-Book, 84% of patients found it very easy or fairly easy to use, and 16% found it not very easy or not at all easy to use.

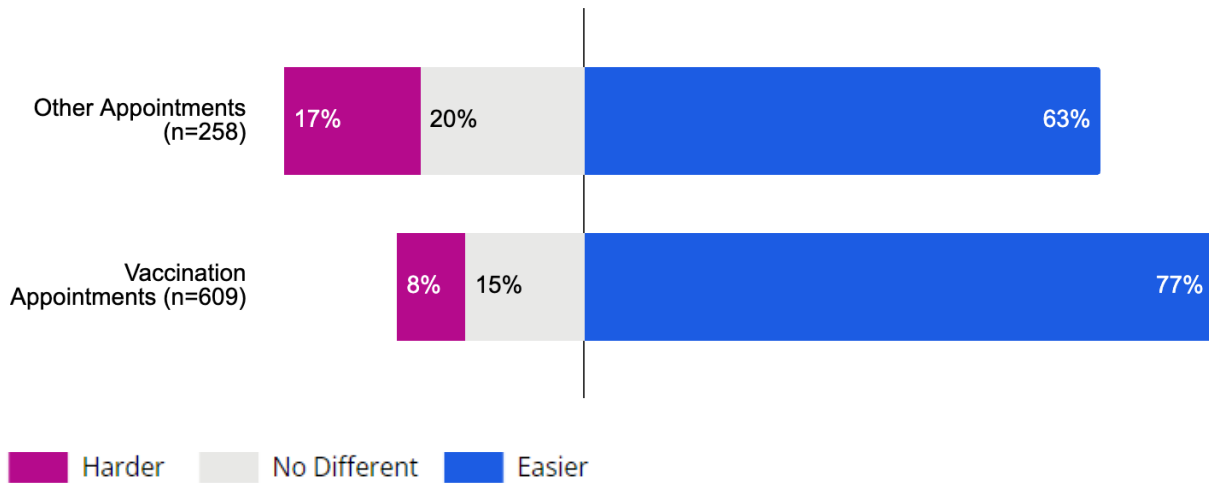
When booking vaccination appointments using Self-Book, 94% of patients found it very easy or fairly easy to use, and 6% found it not very easy or not at all easy to use.



**Figure 10: Survey responses to the following question, "How easy was it to book an appointment using the online booking service?".**



Most patients preferred using Self-Book to calling the practice. For other appointments, 63% of patients found using Self-Book *easier* or *much easier* than phoning their GP surgery, 20% found it *no different* than phoning their GP, and 17% found it *harder* or *much harder* than phoning their GP for vaccination appointments, 77% of patients found using Self-Book *easier* or *much easier* than phoning their GP surgery, 15% found it *no different* than phoning their GP, and only 8% found it *harder* or *much harder* than phoning their GP.



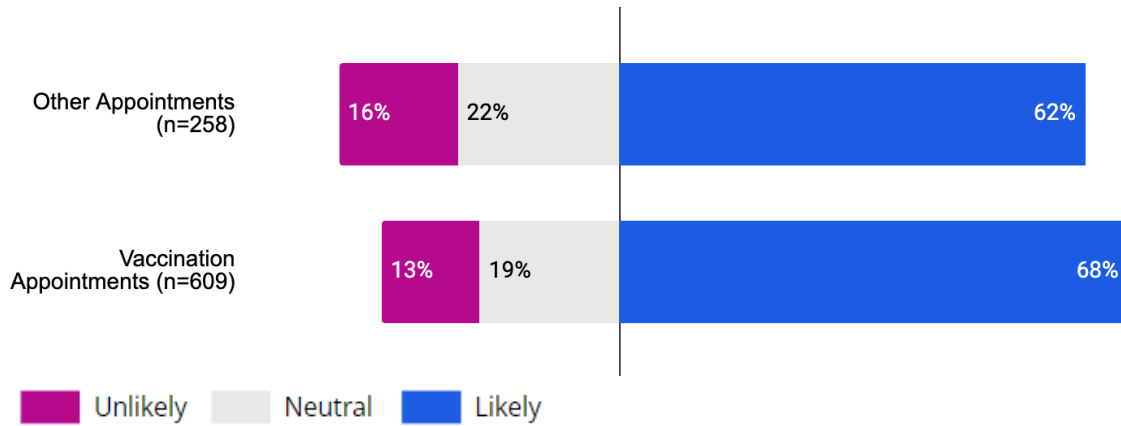
**Figure 11: Survey responses to the following question, "Compared to phoning your GP Surgery to book an appointment, how did you find the online booking service?".**

**Patients would use Self-Book again and recommend it to friends or colleagues**

Most patients would be either *extremely likely* or *likely* to use Self-Book again, and over half of the patients would recommend Self-Book to friends or colleagues.

For other appointments, 62% of patients said it was *extremely likely* or *likely* they would use Self-Book again if it was offered to them, 22% of patients responded neutrally, and 16% of patients said it was *unlikely* or *extremely unlikely* they would use Self-Book again if it were offered to them.

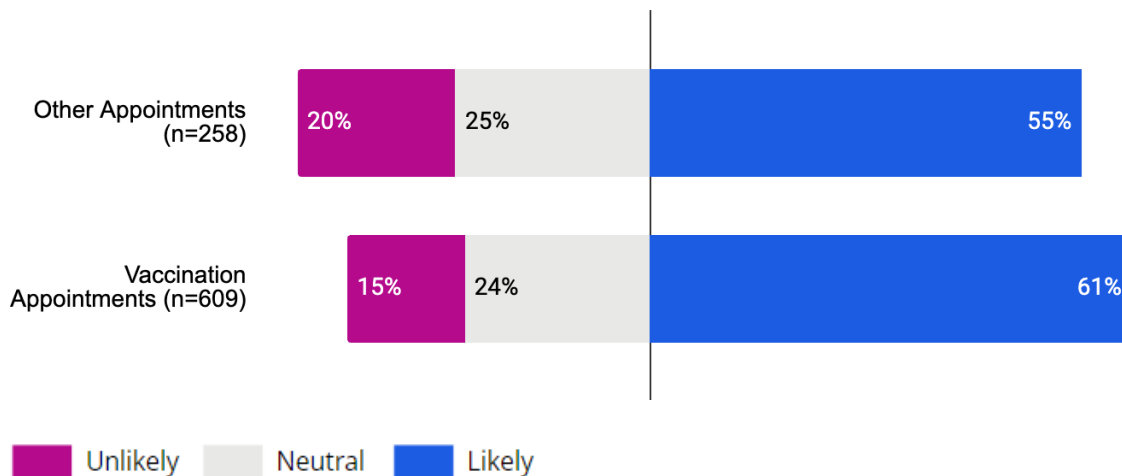
In terms of vaccination appointments, 68% of patients said it was *extremely likely* or *likely* they would use Self-Book again if it were offered to them, 19% of patients responded neutrally, and 13% of patients said it was *unlikely* or *extremely unlikely* they would use Self-Book again if it were offered to them.



**Figure 12: Survey responses to the following question, "Next time you need to book an appointment at the GP surgery, how likely are you to use the online booking service if it was offered to you?".**

When making other appointments, 55% of patients said it was *likely* (4-5 on Likert scale) they would recommend Self-Book to a friend or colleague, 25% of patients responded neutrally (3 on Likert scale), and 20% of patients said it was *unlikely* (1-2 on Likert scale) they would recommend Self-Book to a friend or colleague.

When booking vaccination appointments, 61% of patients said it was *likely* (4-5 on Likert scale) they would recommend Self-Book to a friend or colleague, 24% of patients responded neutrally (3 on Likert scale), and 15% of patients said it was *unlikely* (1-2 on Likert scale) they would recommend Self-Book to a friend or colleague.



**Figure 13: Survey responses to the following question, "How likely is it that you would recommend using the online booking service to a friend or colleague when booking their GP appointment?".**

## Patient Satisfaction

All staff reported that they felt patients had responded to Self-Book positively. They reported that it was a contemporary way to access a service and matched patients' expectations. A practice manager felt that Self-Book was providing a "really positive experience" for patients in the context of the current health system crisis.

**"It feels much more contemporary. It feels more like the rest of their life."**

**"People will just say, can I have a link? Because then they can sit down later on, work out childcare or work or whatever else they're juggling and book their appointment rather than being pressured."**

## Staff satisfaction

### Self-Book improved ways of working in practices

Self-Book had a significant impact on practices' ability to cope with the increased pressures over winter, particularly in the context of higher-than-expected demand. Self-Book was described as "game-changing", and all ten interviewees stated they would recommend Self-Book to other practices.

**"I love it...I think it's so easy."**

**"Very, very positive...I wouldn't be without it now."**

**"I've got so many good things and experiences to say about Accurx. It's fantastic."**

**"It is something that is beneficial to both us and the patients. And I think people are starting to realise that using Self-Book is quicker and easier than having to do it the old way."**



**Figure 14: Ten out of ten (100%) interview respondents said they would recommend Self-Book to other practices.**

### Staff reported reduced stress and improved morale thanks to Self-Book

Telephone work was reported to be a significant factor in stress and dissatisfaction by all staff members interviewed. This was due to the high volume of calls to process and the often negative tone of patients. Patients were often frustrated with the difficulties of getting through to the practice and the availability of appointments. This frustration would often be taken out on the reception staff answering the call. The conversation was further antagonised when staff attempted to negotiate with the patient to find a suitable appointment. Staff reported that these calls could often be challenging and time-consuming.

**“(With Self-Book) then they don't have the task of debating with patients.”**

**“(With Self-Book) you are not getting into that debate.”**

Self-Book enables practices to offload these stressful calls. Either the call is avoided in the first place, or the challenging part of the call (the appointment negotiation) is diverted to Self-Book. The three reception staff interviewed reported that this was a significant benefit, meaning they were more relaxed about starting their shift and seeing a large volume of calls waiting to be answered. This was because they perceived each call to be significantly less challenging.

**“...morale is definitely better.”**

**“...a friendlier and less stressed out reception team than previously because it's (Self-Book's) taken some weight off their shoulders.”**

**“...less stress and the patients are also happier because they are getting sorted quicker.”**

**“It's something that we all really appreciate having in reception especially.”**

### Staff reported improved job satisfaction

Staff reported that the reduction in stress per call as a result of Self-Book meant they had the headspace to dedicate more time to patients where they felt it was needed. This was in contrast to previously, where the volume of calls waiting to be answered meant that each call was answered with an underlying feeling of wanting to finish it as quickly as possible to move on to the next one.

**“So (with Self-Book) I'm not dreading triaging.”**

**“...nobody's got the pressure of calling up the patient for the appointment.”**

**“It makes you feel like you've done a good job and you've not got that pressure of ‘there's 10 other people who you haven't had this same conversation with’, because they've already been dealt with and they've managed their own appointments.”**

As a result of this, reception staff felt they were able to deliver a better service to their patients and this has had a positive impact on their job satisfaction.

### Time Saving

All staff interviewed reported that Self-Book had led to time savings in their practice.



**Figure 15: Ten out of ten (100%) interview respondents answered “Yes” when asked if Self-Book had saved time in their practice.**

### Staff reported reduced call length for appointment bookings since using Self-Book

Before Self-Book, the only method of booking an appointment was by telephoning the surgery. This process was prolonged for both patients and staff. Patients would call the surgery and have to

wait in a long queue of calls before getting through to the reception team. From answering the phone to completing the call, staff reported that the process could take anywhere from “3 minutes” to “15 minutes”.

Each telephone interaction would be time-consuming, involving numerous back-and-forth conversation points on what time/date would suit a patient. The staff member would have to open the electronic appointment diary and navigate a day at a time, listing appointments to the patient until a mutually agreeable slot was found.

**“To get one booking, you're talking about having to log in, go into a patients record...You're talking probably five minutes a call.”**

**“I mean, the amount of time it (Self-Book) has cut down for us is crazy, because we could spend anywhere between 10 to 15 minutes with a patient on the phone booking that one patient in for an appointment. Whereas Self-Book takes only four clicks and that's it, it's done. So it's saved a lot of time.”**

Self-Book enables a streamlined conversation of identifying an appointment is needed and immediately sending the booking link to a patient. The conversation around availability and convenience is avoided, resulting in a much quicker interaction with each patient. Staff estimated that this phone call now takes “a minute or less”.

**“So the case gets handled a lot faster.”**

**“It's so much quicker”**

**“It's (a) less than a minute click job.”**

**Staff reported reduced incoming call volume to the practice since using Self-Book**

All practice sites reported that Self-Book had resulted in fewer calls into the practice. This was primarily due to using Self-Book for bulk recalls of patients, such as long-term condition reviews and immunisation campaigns. Previously, every invite sent out to a patient would have resulted in a potential incoming call to the practice to book an appointment.

**“And (now) our reception team aren't bogged down in calls (to book an appointment). Traditionally we've written to say, please contact reception to book an appointment. Or, asked the receptionist to ring out to book an appointment. They're swamped with phone calls as it is.”**

Practice managers reported that most of these are now resolved via Self-Book. This translated into receptionists spending less time answering these time-consuming calls.

**“It (Self-Book) has impacted our phone calls as well. We send out 8,000 Flu invites. Most of our Flu this year got booked by Self-Book, 90% just for Flu. So that's a significant number. Otherwise, those patients would've called into the practice.”**

In relation to sending out 100 invites for the NHS Health Check in the previous month, one practice manager explained: “That saved 14 calls into the practice and a hundred calls out”.

**“DMARD\* bloods, you know, you've got 300 patients that you're inviting, you just send them that link... then they're not contacting the practice, ringing in offering them four or five different times.”**

*\*Disease-modifying antirheumatic drugs*

### **Improved Efficiency**

**Practice managers reported improved ability to plan recalls with Self-Book**

Self-Book enabled practices to plan recalls proactively. They valued the oversight that Self-Book gave to their batch recalls for different cohorts of patients.

**“...it's been much easier. It's much more visible. I can see that the batches are going through, I can see how many people are booking from those batches.”**

When planning their recall process, practices no longer need to dedicate a staffing resource to receive calls and book appointments. Previously, sending out bulk invites would mean needing staff to receive the incoming calls that resulted from these invites. As these were done en-masse and in one go, these would result in an influx of calls to the practice on the same day. This could overwhelm the phone lines and have knock-on effects for access on that day.

**“I just don't have to worry which day of the week I'm sending the text messages because, you know, I would normally think, okay, how many receptionists do we have downstairs? Do we have enough? How many text messages can I send today?”**

**“Now, I don't really have to worry about it. I can send it any time because I know the majority will be booking directly (via Self-Book). That is really good.”**

With Self-Book, the practices can send out their bulk recalls without worrying about a sudden influx of calls into the practice. Two practice managers reported that previously they would have to plan when to send their recall invites according to their reception staffing. This was no longer the case, as most patients would book online instead of calling the practice.

**“Remember, you used to send the old [SUPPLIER NAME] message. Then reception would say: “What have you done! The phones are going crazy!””**

### **Staff reported a streamlined appointment booking process with Self-Book**

Self-Book allows any staff member to start the appointment booking process with a patient. Booking an appointment previously often involved at least two staff resources.



If a clinician felt that an appointment was necessary (for example, after filing a blood result), they would ask the receptionist to telephone the patient to arrange an appointment.

**“They (a GP) would send a task to reception and then the receptionist would have to call the patient.”**

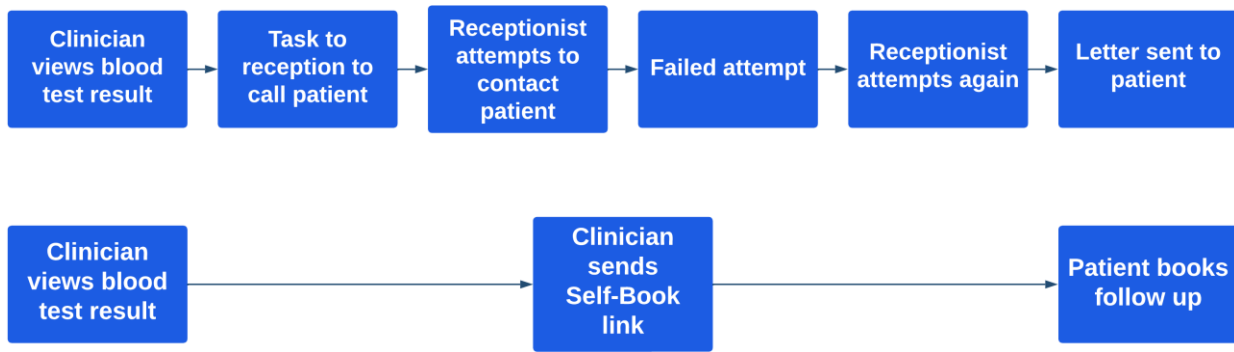
The unplanned nature of the call would mean that the patient may not pick up, necessitating multiple outbound attempts from the practice.

**“So there's none of this back and forth with patients that aren't gonna pick up.”**

Self-Book allows the clinician (or another staff member) to send a booking link directly to a patient without involving the reception team. It also minimises the risk of a failed contact as only one outbound message is needed from the practice.

**“Yes, if they (a GP) receive a test result, they look at the test result, they will contact the patient on Accurx, and they will say what... the blood test results (are), and “please use this link to book an appointment”.”**

**“And what this does is enables the doctor to do the whole process and just send a link out or, or send it to reception to send that link out.”**



**Figure 16: Typical practice workflow for contacting patients regarding a blood result without Self-Book (top pathway) and with Self-Book (bottom pathway).**

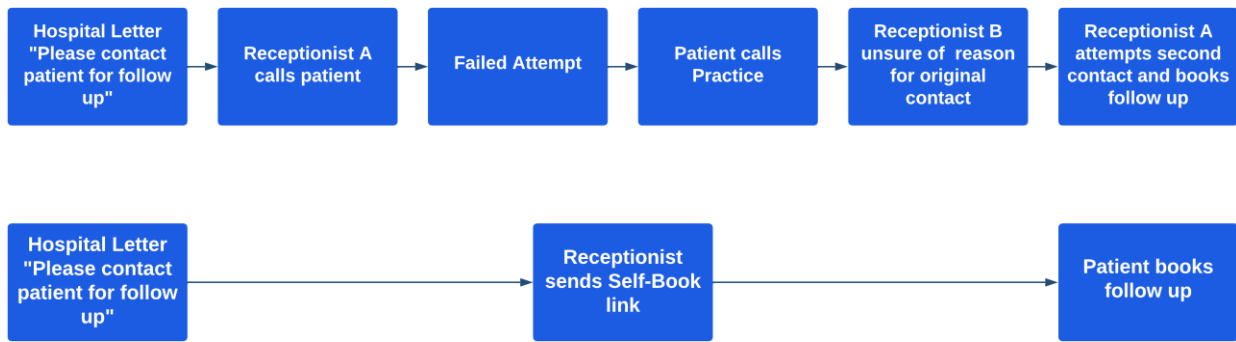
### Assurance was a valued benefit of Self-Book

All staff valued the assurance given by Self-Book's Electronic Health Record integration. This provides an auditable trail of outbound communication from the practice. This was valued both from a medico-legal and efficiency perspective.

Prior to Self-Book, practices had no way of reliably documenting outbound calls from the practice. Staff gave the example of receiving a hospital letter requesting that the GP arrange a follow up for a patient. Previously, a receptionist would attempt to call the patient to arrange this follow-up.

However, as this was an unplanned activity, the patient would not be expecting a call and, therefore, may not answer. The patient may then call the practice in response to this missed call. Another staff member may answer the phone and may not know why the practice called in the first instance. The member of staff who originally tried would then try again later in the day when they returned to the original task.

**“They (reception) can send that text, and as long as they can see it's been delivered, they can put that to bed. They don't have to worry about making a note for themselves and going back to it. That's one off the list. I know they definitely feel it's a lot easier than having to chase the patient around all day.”**



**Figure 17: Typical practice workflow for contacting patients regarding a hospital letter without Self-Book (top pathway) and with Self-Book (bottom pathway).**

Staff reported that Self-Book alleviates this problem as each outbound message and the reason for sending the link are documented automatically in the Electronic Healthcare Record. This means the patient is unlikely to need to call the practice to book an appointment, and if they do (for example, they can't use the Self-Book link), the reason for the initial contact is visible to all staff members.

Self-Book also provided a safety net for assuring that patients had received an outbound communication to patients regarding seeking an appointment. This avoided staff having to repeatedly attempt to ring patients in an attempt to arrange a follow up appointment.

**“(The) fantastic thing about Accurx (Self-Book) is that it immediately goes into the patient notes. So when the patient calls reception, they know what message was sent out. I construct a message where reception knows which appointment to book in.”**

**“Then it's just the assurance that okay, they will get a message to book and it's recorded in the notes and there's an audit trail.”**

**Practices have been able to upskill reception staff due to Self-Book’s time saving**

Two practices reported that Self-Book had enabled them to utilise their reception staff to take on other roles as a result of reduced phone demand. After the implementation of Self-Book, one

receptionist reported other roles they were now performing: “So we (reception) do the registrations, the prescriptions. We do coding and filing now”.

**“So it makes it easier and frees up reception to do the other work that we need to do.”**

This had the dual benefit of increasing the utility of a specific staff role and providing more value to the role itself. Staff reported that solely answering phones all day in the current climate can be extremely demoralising and unsatisfying, leading to burnout and high staff turnover. Increasing the variety of roles performed by reception staff increased job satisfaction and counteracted the negative effects of answering phones.

**“So what has changed because of Self-Book is that we used to have the receptionist doing reception only. They are learning to do other tasks. So we are getting them to do summaries... to help with the scanning... to help with the registrations. So I feel that makes reception a more interesting role.”**

#### **Self-Book allows practices to reduce unused capacity**

Self-Book allowed practices to fulfil unused capacity opportunistically. Unfilled nursing slots over the next few days would have previously remained empty. These are appointments that are normally booked in advance as part of planned care delivery. One manager described sending a Cervical Smear invite to a batch of patients if any nursing appointments for the next day remained available. In this way, Self-Book facilitated the conversion of these routine Nursing appointments to Cervical Screening appointments.

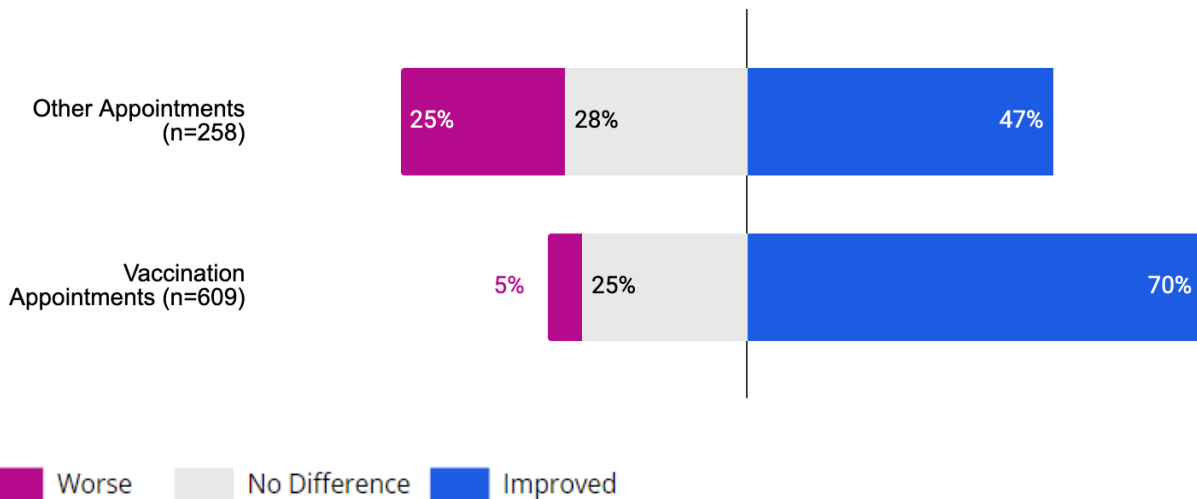
**“It (Self-Book) helps us fill in the appointments now. So we are not left with empty appointments for (the) next day for the nurses. If we have any empty ones, then we just use a Self-Book. I send it before I finish work. I'll send the link to book for**

**smears. I send 50 messages and by next morning when I come in, the nurses have a nicely filled clinic.”**

Of those that booked an appointment via Self-Book, a majority of respondents felt it improved their ability to access appointments.

When booking other appointments, 47% of patients found that their ability to access appointments had *greatly improved* or *improved*, 28% of patients found their ability to access appointments *no different* to before, and 25% of patients found their ability to access appointments had become *worse* or *much worse*.

When booking vaccination appointments, 70% of patients found their ability to access appointments had *greatly improved* or *improved*, 25% of patients found their ability to access appointments *no different* to before, and only 5% of patients found their ability to access appointments had become *worse* or *much worse*.



**Figure 18: Survey responses to the following question, "Compared to before your practice was using the online booking service, has your ability to access GP appointments improved?".**

All staff interviewed agreed that Self-Book had improved access to primary care services for their patients. This was because of the direct impact on the booking system but also the practice wide benefits noted previously.



**Figure 19: Ten out of ten (100%) interview respondents answered “Yes” when asked if Self-Book had improved access to primary care.**

## Digital Barriers

### Self-Book facilitated non-English speaking patients to book an appointment

Self-Book was seen as a better alternative than phoning when a non-English speaking patient needed to book an appointment. Staff described navigating the appointment system via the phone as challenging for these patients.

**“And that's easier for them because they can do it together (with reception) instead of over the phone where you've got three people speaking it can get a bit muddled.”**

**“So then you're not having to just keep offering appointments and dates, and then sometimes they're getting confused because you're just spewing information at them in their second language. So, it's... easier to see it written down.”**

Sending a Self-Book link was more intuitive to non-English speakers. One receptionist described showing a patient who had walked into the surgery how to book an appointment using Self-Book. This had longer term benefits as it demonstrated to the patient how to use the booking link for when they next sought a GP appointment.

**“So, you can go out and you go, “this is how you do it and then you just choose a day and then they're like, ‘okay, do that’.”**

**“So, then you've sat, you've been with them, you've shown them how to do it on the mobile and then in the future they know what to do.”**

**Self-Book can indirectly facilitate access to primary care for elderly patients**

All staff reported that age was the most common barrier to being able to use Self-Book. However, this was felt to be a minority of elderly patients only. They also all felt that Self-Book indirectly facilitated access to primary care services for this group of patients due to the reduced call queue lengths and less stressed staff.

**“So I feel like they (elderly patients) get that (now) and we've got the time to do it because we're not having to do it with every single person.”**

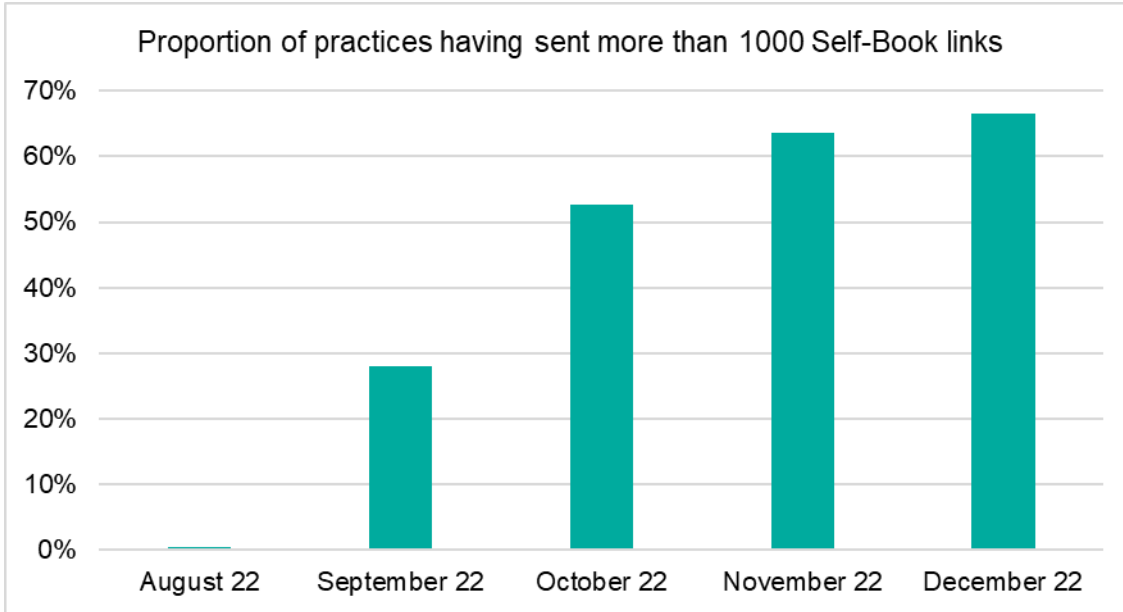
**“So I feel like we get to be... more personable with the (elderly) patients.”**

Previously, elderly patients would be waiting in significant phone queues (“40-60 minutes”) and may have given up rather than completing the call. Reception staff reported feeling like they were able to spend longer on the phone with these patients.

## 4.2. Quantitative Findings

### Self-Book uptake

2942 practices are reported to be using Self-Book nationally, equating to 46% of practices. As expected however, use of Self-Book is not the same across practices and is likely to vary in the number of links sent, types of links sent and use cases of links sent. For practices sending out over 1000 links in a given month, more established and sustained use of Self-Book is indicated. The proportion of practices using Self-Book who send out over 1000 links in a given month is illustrated in illustrated Figure 20.

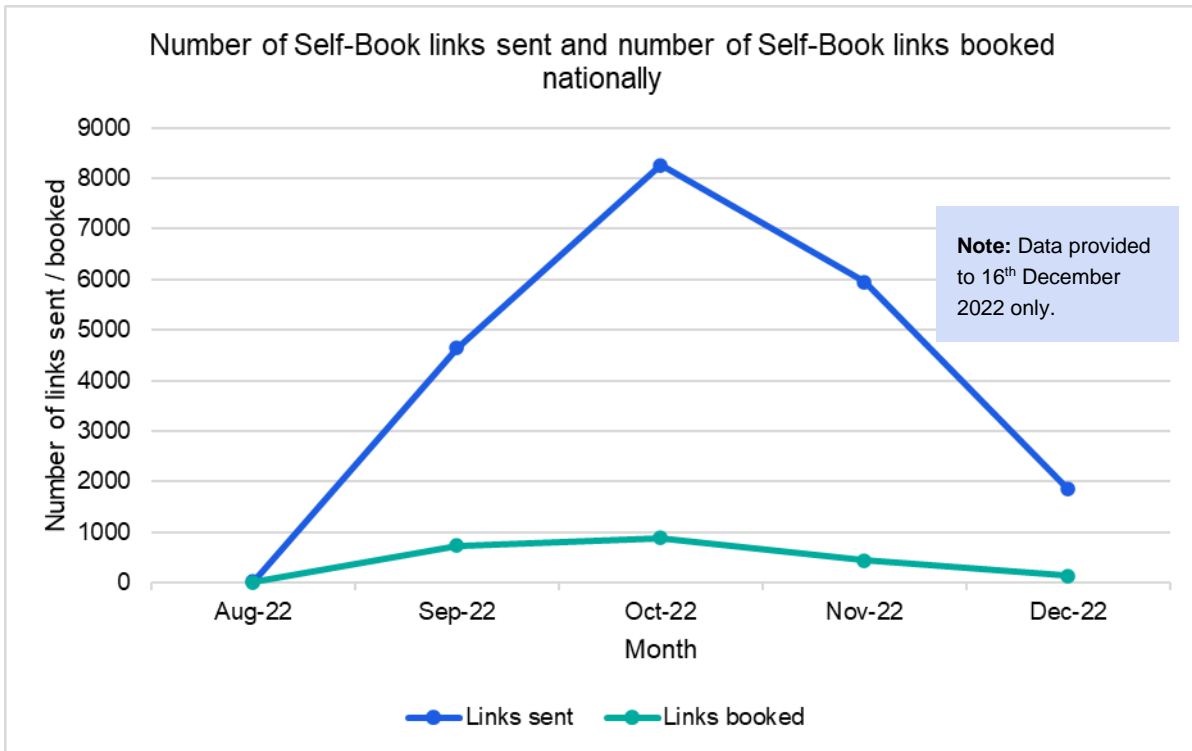


**Figure 20: A cumulative bar chart to show the proportion of practices reaching 1000 links sent over time.**

The proportion of practices using Self-Book who send over 1000 links has increased dramatically since launch in September 2022, reaching 66% in December 2022. As well as suggesting use is more established and sustained in practices using Self-Book, Figure 20 suggests a sustained increase in the spread of Accurx’s Self-Book system across practices. Conversely the average national booking rate between September and December is low at 10.33% (Table 3). It is worth noting however, that this figure varies when looking at certain use cases, which is outlined in further detail in the subsection below.

In contrast to the national picture, the percentage of practices using Self-Book across KSS is 56% - 10% higher than the national figure. Exploring this again at ICB level highlighted variation across KSS, with over 60% of practices in Sussex and Surrey using Self-Book compared to 48% in Kent. Overall booking rate was similar to the national figure at 10.1%. To understand Self-Book uptake over time (number of links sent and booked), data was aggregated monthly based on dates Self-Book links were first sent. This data is presented in Figure 21.



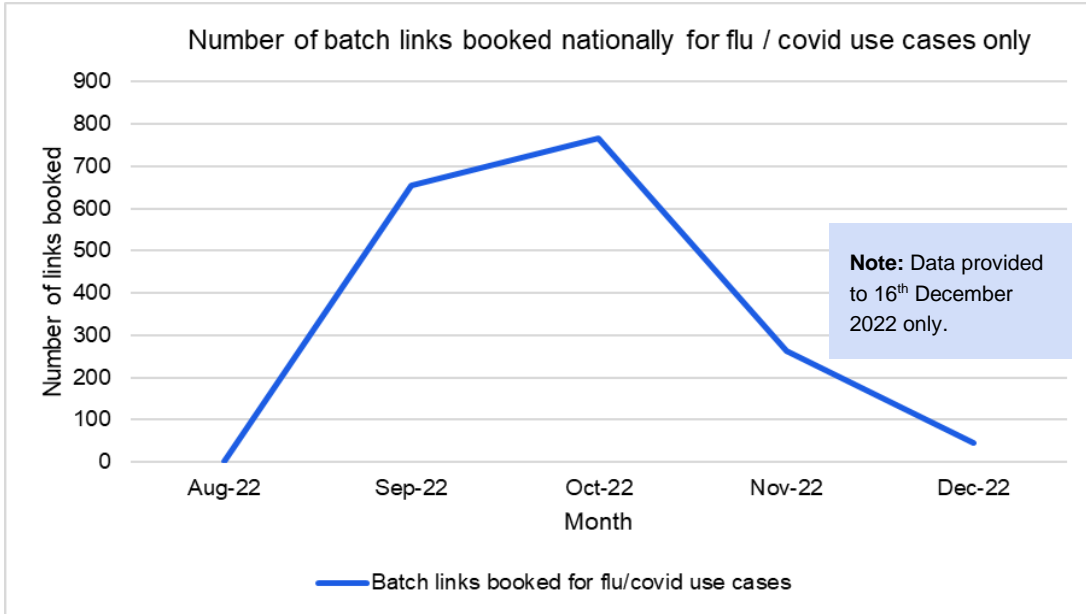


**Figure 21: A line graph illustrating the number of Self-Book links sent by Accurx and the number of Self-Book links sent that resulted in a booking, whereby data is adjusted for population per 100k. Please note: Data was provided to 16th December 2022, and therefore December, as shown, represents only half of the month.**

As depicted in Figure 21, the number of links sent increases sharply from August to October where it peaks, before declining more gradually throughout November and December. A similar trend is observed for the number of links booked. Although these trends parallel one another, booking numbers are much smaller than link numbers, highlighting the low booking rate mentioned previously. To note, when investigated at KSS level, uptake of Self-Book is in alignment with the rest of the country. **Please note:** Data was provided to 16th December 2022, and therefore December, as shown, represents only half of the month.

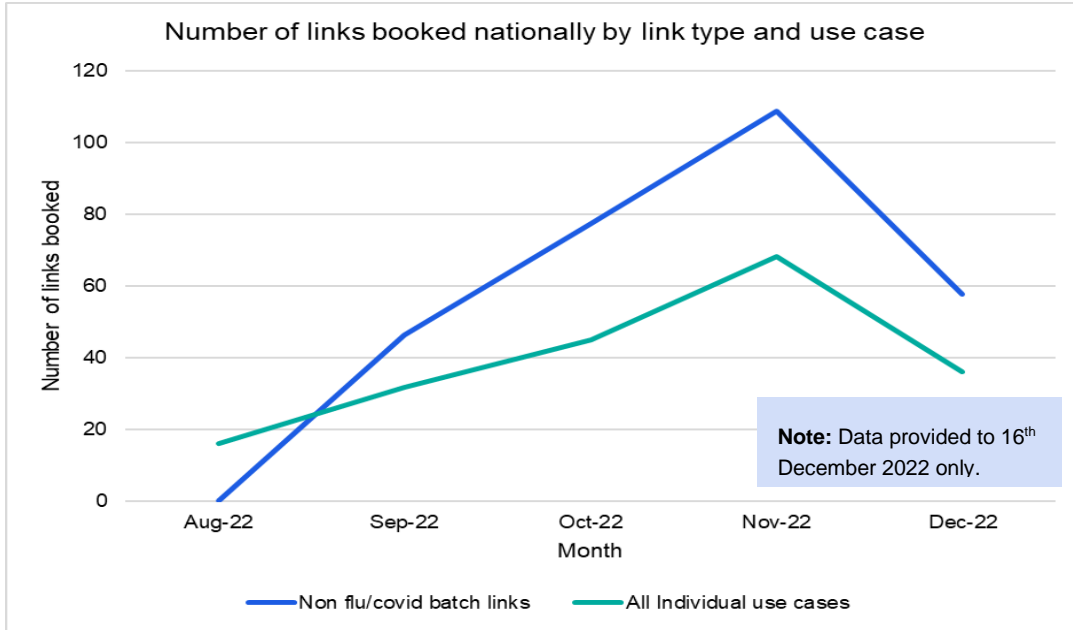
### Self-Book usage

Link types (batch or individual) and use cases were also explored to understand how Self-Book is being used and for what type of appointments. This is presented in Figure 22 and Figure 23 as a time series to investigate how these aspects of Self-Book change over time.



**Figure 22: The number of batch links booked that were for Flu and / or COVID cases only whereby data is adjusted for population per 100k. Please note: Data was provided to 16th December 2022, and therefore December, as shown, represents only half of the month.**

As demonstrated in Figure 22, when focussing on batch links for Flu and / or COVID use cases only, a sharp rise and fall of the line graph is observed over a short period time. The number of batch bookings for Flu / COVID peaks in October at nearly 900 bookings. Given the scale and nature Flu / COVID data, it was more appropriate to present this separate to booking data for individual links and non-Flu / COVID batch links to avoid skewing results (Figure 23). **Please note:** Data was provided to 16th December 2022; therefore, December represents only half of the month.



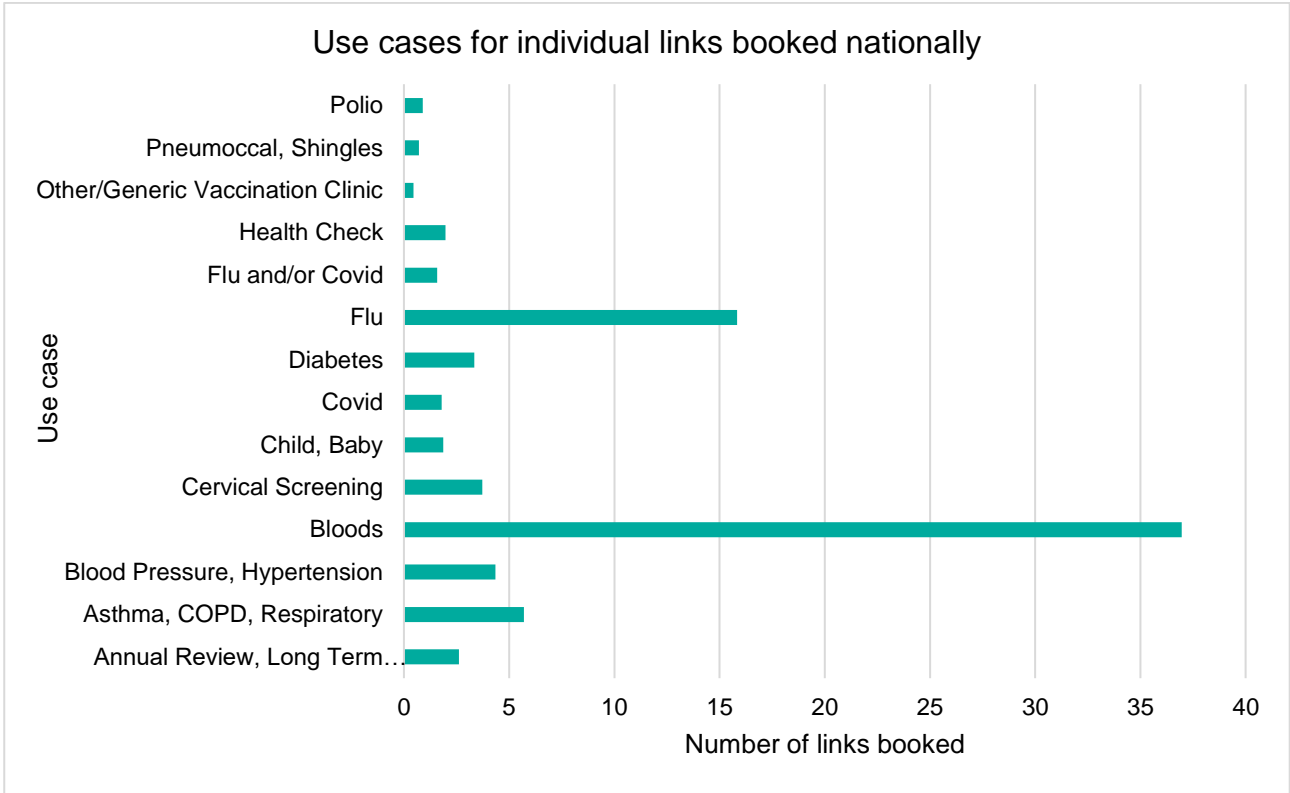
**Figure 23: The number of links booked by link type (batch or individual) and use case excluding Flu / COVID batch links whereby data is adjusted for population per 100k. Please note: Data was provided to 16th December 2022, and therefore December, as shown, represents only half of the month.**

In contrast to Figure 22, the number of bookings using non-Flu/COVID batch links and individual links is increasing gradually in a more linear fashion from August to November 2022. This indicates a steady growth of Self-Book for non-vaccine use cases. **Please note:** Data was provided to 16th December 2022, and therefore December, as shown, represents only half of the month.

**Table 3: Self-Book booking rate average from September 2022 to December 2022.**

Booking rate average	National (%)	KSS (%)
<b>All link types and use cases</b>	10.33	10.80
<b>Batch - Flu / COVID</b>	8.85	9.59
<b>Batch – non-Flu / COVID</b>	10.34	16.18
<b>Individual - all use cases</b>	42.26	42.70

Illustrated in Table 3, Self-Book booking rates vary depending on the link type with individual links returning over four times as many bookings as batch links. Use cases relating to these individual link bookings is outlined in Figure 24. Although higher booking rates are observed for individual links, it is important to note that the total number of individual links sent is much smaller than that of batch links.



**Figure 24: The number of individual links booked stratified by use case between September 2022 and 16<sup>th</sup> December 2022 (adjusted for population per 100k).**

As illustrated in Figure 24, the top three use cases reported being bloods, Flu and asthma/COPD/respiratory. It is important to highlight however, for the benefit of the reader, use cases recorded as ‘not categorised’ or ‘error’ were removed from the chart. Although only a small number of use cases were reported as an error, 55% and 43% of individual links booked were not categorised nationally or at KSS level respectively.

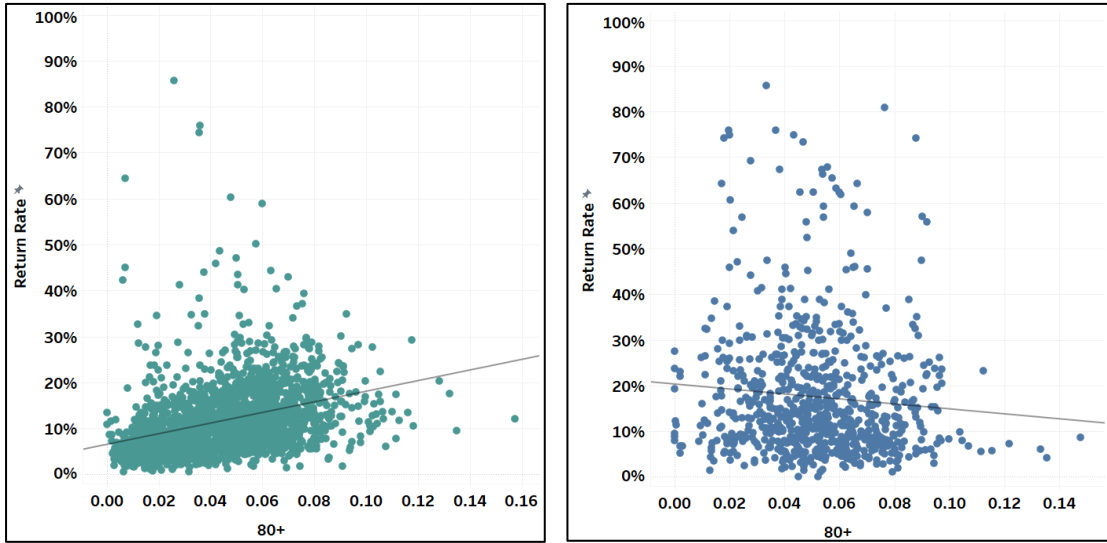
### Health Inequalities

Using Tableau, associations between demographic factors and booking rate were explored and are displayed in Table 4.

**Table 4: Health Inequalities results displaying the association between demographic factors and booking, where a p-value <0.05 is a significant association.**

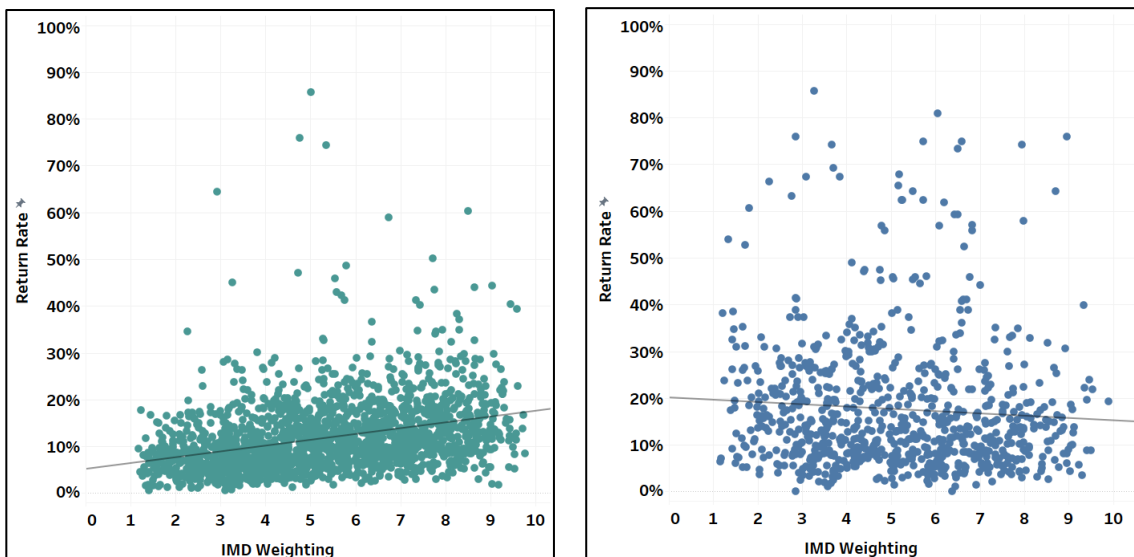
	Demographic factor	Direction of change	P-value	R-squared
All links	65+	higher % of 65+, higher booking rate	< 0.0001	0.129968
	80+	higher % of 80+, higher booking rate	< 0.0001	0.115446
	Deprivation	less deprived, higher booking rate	< 0.0001	0.111779
	Internet User Classification (IUC)	higher usage %, higher booking rate	< 0.0001	0.023038
	GPs per 100k	more GPs per 100k, higher booking rate	< 0.0001	0.0142039
Non-Flu / COVID links only	65+	lower % of 65+, higher booking rate	0.0252538	0.0062346
	80+	lower % of 80+, higher booking rate	0.0168776	0.0071065
	Deprivation	more deprived, higher booking rate	0.0458262	0.0049695
	IUC	No change	0.28297	0.001439
	GPs per 100k	No change	0.438783	0.0007486

Analysis for all Self-Book links and non-Flu / COVID links was separated given the nature of the Flu / COVID data, which is depicted in Figure 22. Given no associations were found between booking rate and the demographic variables IUC and GPs per 100k for non-Flu / COVID links, these were excluded from further analysis (Table 4). In contrast, significant associations were found between the proportion of the population aged 65+, the proportion of the population aged 80+, deprivation and booking rate. Scatterplots illustrating the association for demographic factors 80+ and deprivation can be seen in Figure 25 and Figure 26 respectively.



**Figure 25: Scatterplots to show the association between the percentage of the population who are 80+ and booking rate. The left panel depicts the association using all Self-Book links, whilst the right only includes non-Flu / COVID links.**

Results where there is inclusion of all Self-Book links indicates that for population where there is a higher percentage of those aged 80+, the booking rate is higher. The general trend of non-Flu / COVID data however, suggests that older populations are less likely to engage with Self-Book. Using the r-squared values in Table 4 and the scatterplots, the extensive distribution of data points with respect to the trendline is evident. This implies that despite a numerically significant association, age is not an obstacle to Self-Book particularly as the direction of change for all links association has the opposite direction of change. To note, to ensure the non-Flu / COVID scatterplot was as useful an illustration as possible, one anomaly point was removed.



**Figure 26: Scatterplots to show the association between deprivation and booking rate. The left panel depicts the association using all Self-Book links, whilst the right only includes non-Flu / COVID links.**

All Self-Book activity suggests a significant trend of less deprived communities being more likely to engage. This trend is reversed for non-vaccine use cases however, with more deprived communities being slightly more likely to engaged. Although the p-value indicates these associations to be significant, the r-squared value (Table 4) and apparent broad distribution of results around the trend line suggests that deprivation is not a barrier, but a consideration to be made when deploying Self-Book.

### 4.3. Health Economic Results

This section presents the results of the health economic model. The model produced estimates of the benefits under the three scenarios outlined in the methodology section: the impact of Self-Book at PCN level, ICB level and nationally. The results are estimated over a period of 5 years, in net present value terms, in line with the general health economic methodology detailed in Appendix A: Health economic details.

Importantly, an additional, universal optimism bias correction is applied to *all* benefits to ensure maximum prudence in the estimation of the impact of Self-Book. The total benefits are the main outputs of interest, and will be provided below for each scenario, alongside the results from the sensitivity analysis.

***Please note: the benefit figures presented in this report are calculated only in relation to Self-Book and not Accurx as a platform in general, where benefits are likely much more significant.***

#### Scenario 1 – PCN

Table 5: Scenario 1 health economics results table.

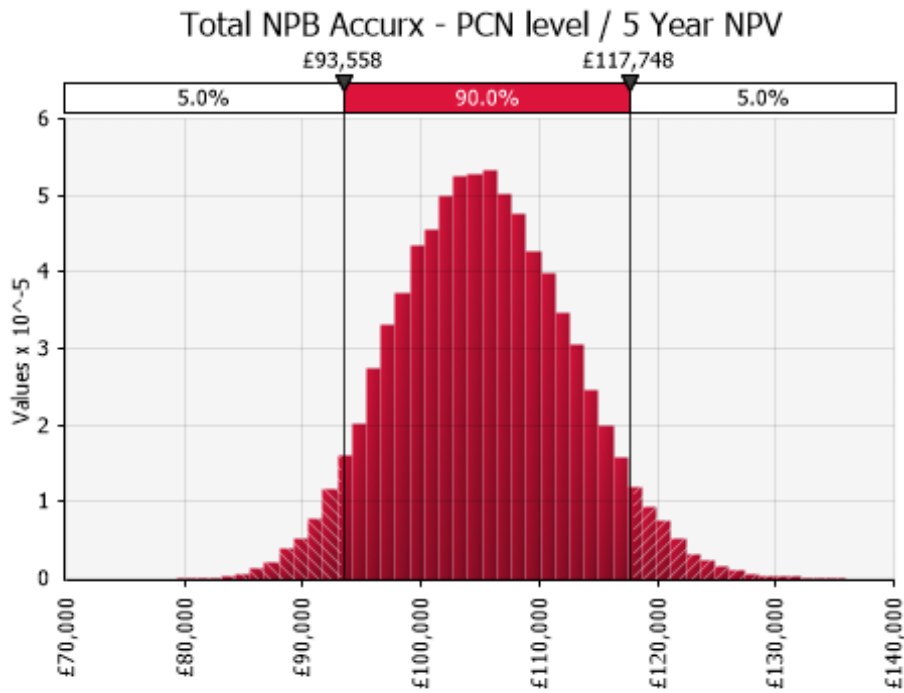
Accurx - PCN level (£ represented as net present value in 2022 figures)	2023/24	2024/25	2025/26	2026/27	2027/28	5-year (2023/24 - 2027/28)
<b>Benefits</b>						
1.1 Reduction in phone calls to practice	£7k	£7k	£7k	£7k	£7k	£35k
1.2 Reduction in DNAs	£14k	£14k	£14k	£14k	£13k	£70k
<b>Total Benefits</b>	<b>£22k</b>	<b>£21k</b>	<b>£21k</b>	<b>£21k</b>	<b>£20k</b>	<b>£105k</b>
*The figures above have been rounded to the nearest whole pound for presentation and as such totals may not sum						

Table 5 presents the estimates of the benefits of Self-Book at PCN level over the next five years, assuming continuation at current operation levels. The total benefits remain fairly consistent in each year, totalling a benefit of £105,000 after 5 years.

The largest benefit is provided by the benefit of the reduction in DNAs, which generates £70,000 over five years and accounts for roughly 67% of the total benefit generated. Then comes the benefit of the reduction in phone calls to practice, which totals £35,000 after five years and is responsible for around 33% of the total benefit.

**Sensitivity analysis**

The sensitivity analysis provides a quantitative estimate of how various sources of uncertainty within the model contribute to the overall uncertainty in the results. Figure 27 presents the results of the scenario 1 analysis performed using @RISK. As depicted in Figure 27, over a five-year period the 90% confidence interval for the NPB for scenario 1 falls between £94,000 and £118,000, with an expected value (mean) of around £105,000.



**Figure 27: Scenario 1 sensitivity analysis results.**



## Scenario 2 – ICB

Table 6: Scenario 2 health economics results table.

Accurx - ICB level (£ represented as net present value in 2022 figures)	2023/24	2024/25	2025/26	2026/27	2027/28	5-year (2023/24 - 2027/28)
<b>Benefits</b>						
<b>2.1 Reduction in phone calls to practice</b>	£220k	£216k	£214k	£211k	£207k	£1,068k
<b>2.2 Reduction in DNAs</b>	£440k	£431k	£426k	£417k	£407k	£2,122k
<b>Total Benefits</b>	£660k	£648k	£640k	£629k	£614k	£3,190k
*The figures above have been rounded to the nearest whole pound for presentation and as such totals may not sum						

Table 6 presents the estimates of the benefits of Self-Book at ICB level over the next five years, assuming continuation at current operation levels. Total benefits of £3,190,000 are projected.

Similar to scenario 1, reduction in DNAs is the largest contributor to the benefits. This generates £2,122,000 over five years and accounts for roughly 66.5% of the total benefit generated. Further to this benefit, an additional benefit of £1,068,000 is estimated in terms of reduction in phone calls to practice over a five-year period and accounts for the remaining 33.5% of the total benefit generated.

### ***Sensitivity analysis***

As seen in Figure 28, over a five-year period the 90% confidence interval for the NPV for scenario 2 falls between £2.8 million and £3.6 million, with an expected value (mean) of around £3.2 million.

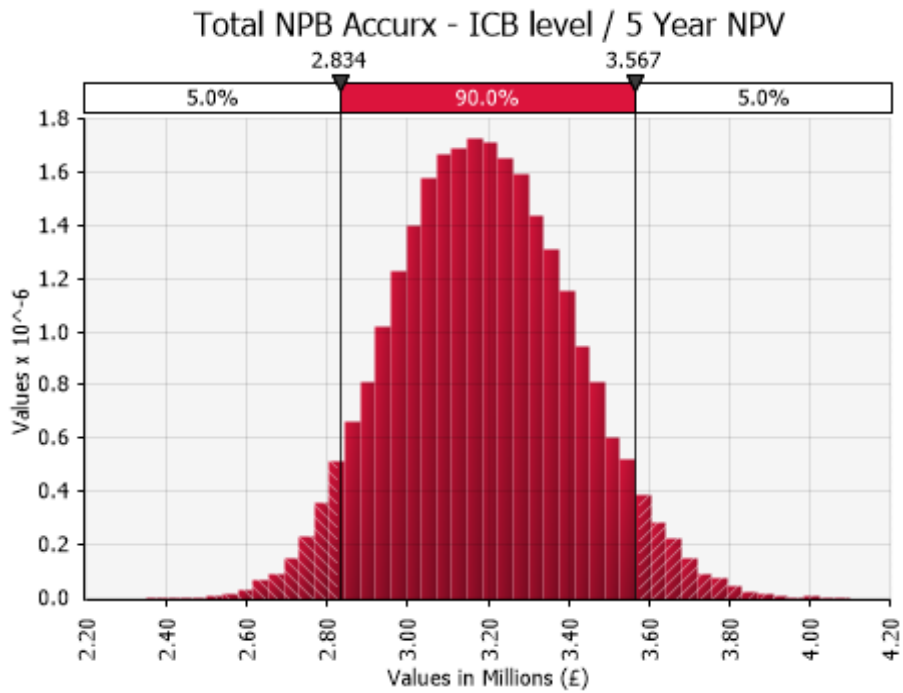


Figure 28: Scenario 2 sensitivity analysis results.

### Scenario 3 – National

Table 7: Scenario 3 health economics results table.

Accurx - National level (£ represented as net present value in 2022 figures)	2023/24	2024/25	2025/26	2026/27	2027/28	5-year (2023/24 - 2027/28)
<b>Benefits</b>						
<b>3.1 Reduction in phone calls to practice</b>	£8.5m	£8.3m	£8.3m	£8.1m	£8.0m	£41.2m
<b>3.2 Reduction in DNAs</b>	£17.0m	£16.6m	£16.4m	£16.1m	£15.7m	£81.9m
<b>Total Benefits</b>	£25.5m	£25.0m	£24.7m	£24.3m	£23.7m	£123.1m
*The figures above have been rounded to the nearest whole pound for presentation and as such totals may not sum						

Table 7 shows estimates of the benefits of Self-Book nationally over the next five years. Like scenario 2, total benefit estimates are projected to decrease over the five-year period. After five years the total benefit comes to around £123.1 million.

The benefits are distributed between each benefit stream in the same proportions as the previous two scenarios, with the reduction in DNAs the largest (£81.9 million after five years), followed by the reduction in phone calls to practice (£41.2 million after five years).

**Sensitivity analysis**

Sensitivity results for scenario 3 are illustrated in Figure 29. Over a five-year period the 90% confidence interval for the NPB for scenario 3 falls between £109.4 million and £137.6 million, with an expected value (mean) of around £123.1 million.

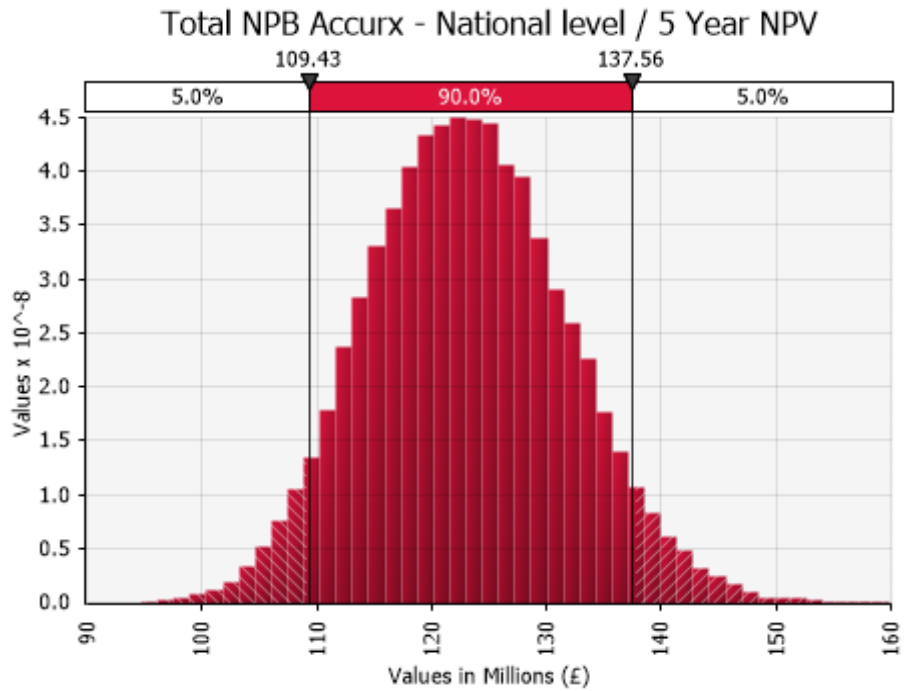


Figure 29: Scenario 3 sensitivity analysis results.

## 5. Discussion

Between the launch of the Self-Book function in September 2022 and the end of the year 46% of practices nationally have used the system. As shown in figure 1, 66% of practices have sent over 1000 links. Over 75% of total activity to date has been in the form of batch messaging categorised as being related to Flu and/or COVID19 immunisation campaigns. This has resulted in a peak of activity in September and October, which steeply dropped after the initial winter campaign had run its course. Throughout this time, however, the number of booking links that have been sent for other purposes has steadily grown, as the system has been established within practices and the full utility of the function has been better understood by practices.

### **Self-Book is used for a variety of use cases**

All practices initially started using Self-Book for Immunisation and Flu campaigns. After seeing success, practices started utilising the platform for other appointment processes, including bulk invitations for cohorts of patients. New-born baby checks and immunisations were common cases, while the system was also used to help practices manage long-term conditions, such as diabetes and asthma.

Primary care has moved towards a triage-first model during and after the pandemic. Self-Book has been instrumental in delivering this care model for the practices interviewed. Self-Book has allowed practices to manage their triage demands quickly and efficiently without a knock-on impact on the phone lines and reception team.

Self-Book has also facilitated the process around other administrative workflows in practices. These included booking follow-ups in response to hospital letters or filing pathology results.

### ***Implications for Quality Outcomes Framework (QOF) achievement***

As noted in the results, practices have found Self-Book extremely useful for streamlining their recall process, and as a result, it has become an essential part of their QOF process. All practices interviewed said Self-Book had been critical in achieving QOF targets this year.

### **Benefits for practices**

#### ***Self-Book made it possible for practices to respond to increased demand***

All staff interviewed reported that Self-Book had made a significant and fundamental difference in their ways of working. This had been felt to be especially true over the preceding few months of increased demand due to winter pressures, and scarlet fever and strep A outbreaks.

Practices had designed their workflows around Self-Book due to the improvements in efficiencies and time savings it enabled. All interviewed sites had plans to expand Self-Book to more use cases and booking flows.

Many reported that it was difficult to imagine how they would have managed the demand without access to Self-Book. It was interesting to note that staff vocalised an element of gratitude for having access to the platform over this challenging period.

### ***Staff reported that Self-Book had reduced stress levels and improved job satisfaction***

The increased demand and pressure on primary care have led to high rates of burnout and stress among staff. The interview findings suggest a significant part of this is the volume and nature of the phone calls fielded by the practice. Patients' frustration with accessing primary care is often taken out on staff when a patient calls to book an appointment. These calls can often be a negative and challenging experience, with patients' expectations not being met and receptionists managing this amongst a sea of calls waiting.

Self-Book off-loads these phone calls to the online booking system. Consequently, reception staff have the headspace to spend longer with patients who need it - for example, an elderly patient who is hard of hearing. Patients can book at their own pace and spend time finding a date/time suitable for them. They do not have to wait in a long phone queue.

Interacting on the phone is more enjoyable for reception staff. A staff member said they previously would dread starting a shift, but this was no longer the case with Self-Book. Practice managers reported improved satisfaction due to Self-Book giving an element of control back to them for managing demand and appointment bookings.

### ***All staff interviewed would recommend Self-Book to other practices***

The wide-ranging benefits of Self-Book experienced by practices meant that all staff interviewed would undoubtedly recommend it to other practices and colleagues.

## **Self-Book has led to significant time saving for practices**

### ***Self-Book reduced the time spent by staff on booking appointments***

Appointment bookings in primary care have traditionally been completed via phone calls. This process is time-consuming for both the patient and staff. As noted previously, it can often be a challenging interaction. Staff noted that the time to book an appointment is often longer than the appointment itself. This is partly due to the inefficient interaction with the electronic appointment system and the back-and-forth conversation with the patient about convenience and urgency.

Self-Book drastically reduces this interaction to either meaning no phone call is needed in the first instance or only a very short phone call. When the need for an appointment is identified during phone calls, a link can be sent out, and the phone call completed. Reducing this call to a 60-second interaction and a few mouse clicks has significantly impacted the practices interviewed. Crucially, the task of booking an appointment was previously avoided by clinicians and pushed to reception staff, as it was so time-consuming. Now with Self-Book, clinicians can complete the booking process without involving another staff member.

***Practices were able to utilise reception staff in other roles as a result of time saved***

For some practices, the time saving for reception staff was so significant that they were able to employ these staff in other roles, increasing job satisfaction and creating capacity to proactively work towards long-term targets and goals, rather than just focus on day-to-day demands. Progress made against these additional tasks may yield monetary benefits beyond the time saved itself, although it was not possible to fully capture this data within the scope of this evaluation.

**Self-Book has improved efficiency in practices*****Self-Book has allowed practices to streamline their recall process and booking system***

Practices were previously spending considerable time arranging appointments for patients. This was a combination of inbound calls from patients and outbound calls/letters/SMS asking patients to book appointments. Self-Book has streamlined this process to a single outbound communication from the practice asking the patient to book an appointment.

***Staff reported that Self-Book reduced incoming call volume***

The outbound communication would have previously resulted in a call back to the practice and subsequent cumbersome booking workflow. The influx of calls resulting from this meant that practices had to plan around the staff's capacity to receive these calls. Self-Book now means that bulk invites are not subject to planning around staff resources as there are fewer incoming calls resulting from the outbound message.

Practice sites gave multiple examples of cohorts of thousands of patients who had booked using Self-Book over the preceding months. They reflected that without Self-Book, these were thousands of calls they would have had to receive and action in the context of worsening demand and a workforce crisis.

This finding has supported the development a core benefit stream for health economic analysis, with the number of calls saved and the associated value of the time saved for staff in having to make calls to book appointments being central to the wide range of efficiency savings a practice could subsequently make. This is not a cash-releasing saving, however, and much, if not all, of the time saved would likely be absorbed by other tasks. As previously mentioned, the subsequent benefits of this time-saving is not clearly established at this point, but the qualitative portion of this evaluation has helped illustrate the perceived value to both practices and staff.

***Reduced staff resources per appointment booking were needed as a result of Self-Book***

Many workflows previously required multiple staff resources to complete a successful booking. Actioning a task requiring an appointment booking would take at least two staff members, and often more if the patient was not contacted successfully on the first attempt. Self-Book has reduced the number of staff resources needed to action the same task to one.

### ***Self-Book helped to fill unused capacity***

The increased efficiency presented by Self-Book has facilitated novel use cases such as filling unused routine nursing appointments with bulk invite patients at the last minute. This would not have been possible previously due to the time and staff resourcing required to send the invites and receive the booking phone calls. Self-Book means one staff member can instigate the whole process within a few minutes.

### ***Self-Book appears to mitigate the risk of DNAs***

Analysis of appointment data provided by participating GP practices, suggests that Self-Book may also mitigate the risk of patients not attending their appointments. While an increase in DNAs was observed across participating practices, the increase was less severe than that observed across Primary Care during the same timeframe. This suggests that giving people the option to select an appointment at a time and date that is convenient to them reduces the risk that they will not attend.

## **Economic Benefits**

Health economic analysis has found that the Self-Book system is likely to provide a positive return across all three scenarios. Benefits at a PCN level were estimated to total £105,000 over a five-year period, while this rises to £3.19 million when applied at an ICB level and £123.1 million nationally. The included benefits are expected to be primarily experienced by the practices themselves. At an ICB level, the reduction in phone calls accounted for around £1.07 million over the five-year period, while the assumed reduction in DNAs accounted for a further £2.1 million.

While there are limitations to this analysis, primarily due to the early stage of deployment, the data provided to-date, supplemented by consistent testimony from stakeholders and users of the functionality, show that the benefits Self-Book may bring to practices around the country are likely to outstrip the cost of the system. It should be noted, however, the range of uses practices have engaged in and the importance of embedding the system within the workload in an effective way. The categorisation of links sent that consistently yield strong booking rates is important information to support practices in experiencing the potential benefits of the system.

## **Patients had a positive experience of Self-Book**

The survey results show that patients had a positive experience using Self-Book. Patients preferred Self-Book to phoning the practice. This correlates with staff feedback on the benefits of Self-Book and the convenience it affords patients. As noted by one of the interviewees, Self-Book presents a modern contemporary way of accessing a service for patients. Most patients found Self-Book easy to use and would recommend it to others.

This feedback should be considered in the context of worsening national satisfaction with primary care, dropping from 84% in 2018 to 72% in 2022 (NHS England, 2022). Specifically, only 53% of patients found it easy to get through on the phone at their GP surgery in 2022. Just over half of patients felt their experience of making an appointment was good.

In the context of these national satisfaction results, the patient feedback in this evaluation is very positive.

## **Self-Book may enable access to primary care**

### ***Staff felt access to primary care had improved by using Self-Book***

All staff interviewed reported that Self-Book had improved access to primary care services for their patients. The gains in time saving and efficiency had downstream effects in improving access. Staff reported shorter phone queue lengths and even physical queues at reception.

Crucially, they highlighted that the reduced phone waiting time meant patients who could not use Self-Book or speak to someone at the practice could get through much quicker. These patients, who may have otherwise given up on seeking help, can now speak to a staff member without waiting as long. Staff highlighted that this was particularly important for cohorts who traditionally have poor engagement with health care.

### ***External factors play a significant role in the patients journey to accessing primary care***

In this evaluation's survey, the majority of responses received from patients regarding access to primary care were positive. The negative responses received are likely a reflection on overall satisfaction levels with primary care.

Over the last five years, satisfaction with access to primary care has decreased (NHS England, 2022). The entire journey from needing an appointment to successfully attending that appointment determines satisfaction for access to primary care. It is important to note that Self-Book is only one part of this journey. Other factors such as availability of appointments and staffing will have a significant impact on overall satisfaction levels.

The contrast between the responses to Self-Book specifically and the broader question of access highlights external factors that must be considered when planning digital access. However good an online booking system is, it will always be rate-limited by a lack of appointments to book into. Important issues such as the workforce crisis need to be addressed to help maximise the effectiveness of tools like Self-Book.

## **Health Inequalities**

### ***Age was noted to be a factor to accessing digital health tools***

Although staff reported that Self-Book was beneficial for the majority of patients, age emerged as a theme when considering patients who may not be able to use Self-Book.

Staff felt that this was a minority of elderly patients, and many had no issues using Self-Book. For those unable to use Self-Book, staff felt that the broader benefits described above facilitated access to primary care for this group of patients. In particular, staff noted that the reduced queue length and volume of calls meant that elderly patients could get through to the surgery more quickly.



Furthermore, receptionists felt that they could deliver a better service to these patients due to the reduction in stress and pressure brought about by Self-Book.

Elderly patients reported issues such as not having access to the internet or a smartphone. Statistical analysis supported this finding, suggesting that practices with a more elderly population were more likely to experience a lower booking rate. The distribution of data, however, showed that this finding is limited due to the sheer variation within the results. Many practices with more elderly populations still experienced stronger return rates than would otherwise be expected, suggesting that age should not be considered a strict barrier to engagement.

**Table 8: Survey comments left by patients on why they did not use Self-Book.**

Age	Comment
Over 85	“I am not on the internet so rely on family”
Over 85	“Unable to use computers due to dementia”

***Deprivation is a factor affecting engagement, but not necessarily a barrier.***

Statistical analysis of practice booking rates, taking local deprivation into account presented a mixed set of results. A significant trend was recognised for all booking activity, including immunisation campaigns, which suggested that areas with lower levels of deprivation are more likely to engage with Self-Book. Contrary to this, once immunisation links were excluded from this analysis, the trend was reversed, with a slightly higher booking success rate shown for areas with higher levels of deprivation.

These are interesting results, suggesting that the use of Self-Book may affect the likelihood of success within communities that may otherwise face challenges to access healthcare. Individual and targeted batch messaging appear to be more successful in more deprived areas, but it may also reflect the willingness of practices within these areas to find scalable time-saving solutions.

***Self-Book facilitates access for non-English speaking patients.***

Language can be a significant barrier to accessing healthcare. This is particularly true for navigating the appointment system via a telephone conversation for non-English speaking patients. Self-Book was an intuitive way to book appointments for non-English speaking patients, significantly more manageable than phoning.

## 6. Limitations

### **Time since launch of Self-Book**

As the Self-Book system is recently launched, not all benefits of its use are fully understood. It may take some time for best practice to be developed by its users, and further time for time savings to be realised in the form of downstream benefits. For example, QOF returns are a year-long endeavour and results are only published long after the reporting period. It is difficult to understand the potential impact without these data and scope to engage practices and understand exactly how the system assists with attainment.

### **Selection bias**

There may be selection bias in the survey results as only patients that received the survey from their practice were sampled. Within this sample of patients, there may be a response bias i.e., the survey may have only been completed by those who are literate, have access to the internet, and are sufficiently biased (either positively or negatively) to be interested in answering the survey. There may also be a social desirability bias where respondents feel pressure to give answers that are socially desirable or that align with what they believe the researcher wants to hear.

### **Limitations in comparing to GPSS results**

The national GPSS survey results are weighted, making them more representative of the population. The results gathered from our survey were not weighted and therefore, cannot directly be compared with results from the GPSS survey. The survey GPSS survey results are presented to give context to the discussion rather than to be used as a comparator.

### **Limitations with Likert scales**

Whilst Likert scales are commonly used in gathering qualitative data and provide a number of response options, there is limited granularity in the responses i.e., the difference between Very Good and Good, and Very Bad and Bad is not distinguished and is left to the interpretation of the respondent. Scale points may be interpreted differently by respondents, which can cause inconsistencies in the results. For the purpose of simplifying data, this report has combined the positive responses (e.g., Very Good and Good) and the negative responses (e.g., Very Bad and Bad) to create more clearly-interpretable results.

Likert scales can capture how respondents feel about a certain product or service, however, they cannot establish causality or explain why respondents hold a particular attitude or opinion. These opinions may need to be further explored either via free text options or follow-up interviews, although this may be difficult to put into practice.

## Health Economic Assumptions

Assumptions were made to support health economic analyses, it is important that results are viewed in the context of the following factors:

- True impact on call volumes: Due to inconsistent data provided by GP Practices, it was not possible to observe a clear view of the impact upon call volumes following the launch of Self-Book. Instead, an assumption was used that each booking would represent a single call that would otherwise have had to take place. This view was validated through engagement with GP Practices.
- Causal evidence of vaccine uptake: Evidence collected showed a correlation between increased vaccine uptake and the launch of Self-Book, while the availability of online booking is one of the major changes that applies to the period observed, real-world data and patient engagement would be required to truly prove that the messaging and availability of Self-Book was the catalyst leading to greater uptake.
- Real-world benefits of vaccine delivery: Due to the level of most reporting into the impact of vaccine delivery it was challenging to determine the actual savings to the healthcare system in terms of clear numbers of hospital admissions saved per additional vaccine delivered. As a result, we have based our calculation on a previous cost-effectiveness study. This incorporates healthcare utilisation and admissions, but not in UK context. A higher optimism bias was used in relation to this benefit stream to account for the increased uncertainty.
- Impact upon vaccination programme messaging: While the data relating to the autumn vaccination campaign does include some evidence of savings to GP Practices, a confounding factor was that many patients opted to receive immunisation at non-GP sites. This has made it difficult to understand the true impact of Self-Book in this respect.

# 7. Recommendations

## 7.1. Further analysis

While the core benefits streams included within the health economic analysis are not directly cash-releasing, feedback from practices have hinted at a variety of potential cash saving benefits that may result from the resulting efficiency. Future evaluation should be considered to track the impact of the service over a longer timeframe, observing the impact of the system upon Quality Outcomes Framework (QOF) attainment and time required to undertake triage processes. Future evaluation could also potentially assess the impact of using Accurx as an end-to-end triage system, in place of a combination of systems, as many practices currently operate.

## 7.2. Development of case studies / best practice

Both qualitative and quantitative elements within the evaluation identified variation in terms of how practices utilised Self-Book and the kind of benefits they are working to realise. The development of case studies may support effective adoption, sharing knowledge and success across organisations and supporting a consistent set of benefits being realised. This could incorporate key considerations that have arisen through analysis into potential health inequalities, highlighting the age and deprivation status of the local population as key considerations, but not barriers to the effective use of Self-Book.

## 7.3. Further development of the platform

Practice staff were enthusiastic when it came to the potential for further development to the platform and the additional benefits these might yield. Suggestions were made throughout the process and shared with the company, with many individuals keen to support any live-testing these may lead to. This is believed to already be an aim Accurx are actively working towards, as one suggestion (the ability for patients to actively decline the message) had already been developed and was in the process of being launched when the suggestion was received.

# 8. Concluding remarks

Across both qualitative and health economic evaluation workstream, it appears that Accurx's Self-Book facility is likely to provide value to primary care organisations once it is an established part of operating processes. It is anticipated that most of these benefits would be experienced by the adopting practices themselves, with all practices interviewed raising further potential impacts upon workflow and QOF achievement.

Benefits at a PCN level were estimated to total £105,000 over a five-year period, while this rises to £3.19 million when applied at an ICB level and £123.1 million nationally. The included benefits are expected to be primarily experienced by the practices themselves, with a reduction in DNAs being the most significant benefit stream. At an ICB level, the reduction in phone calls relating to individual appointment booking accounted for around £1.1 million over the five-year period, while the assumed reduction in DNAs accounted for a further £2.1 million.

It should be noted that most of these benefits are in the form of non-cash releasing savings, meaning that while they release capacity, it is unlikely that this will be seen in terms of real savings or greater income. There are, however, several unmodelled benefits that may be unlocked as a result of service efficiency created by Self-Book. For example, the ability to use batch messaging to manage long-term conditions may support Practices in completing QOF requirements more efficiently, avoiding potential bottlenecks and allowing routine activity to be evenly spread across

the year. There may also be direct impact in terms of the number of routine testing appointments undertaken, as some participants highlighted how easily they could schedule a block of time and offer it to patients, even at short notice, and have it utilised. Finally, some stakeholders also claimed that the use of Accurx's end-to-end solution has had a significant impact upon triage times, saving minutes per case and providing a real saving in terms of staffing numbers required to support peak-time Monday activity.

Through qualitative engagement, it was clear that stakeholders held a high opinion of the Self-Book facility, highlighting how it had supported service efficiency and provided time and space during a period when practice staff have felt under increasing pressure. Staff reported increased job satisfaction and reduced stress, while also claiming the benefits of having additional time to support patients that may still need to book appointments by traditional means. The evaluators have also appreciated the access practices have been willing to grant amidst a busy winter schedule, with participants keen to support the evaluation and find time to attend interviews or issue surveys. This may be attributed to enthusiasm for the system.

Patients similarly reported positive experience of Self-Book, in response to surveys delivered within the qualitative evaluation workstream. Most patients found Self-Book easy to use and would recommend it to others, in contrast to decreasing national satisfaction with primary care access where only just over half of patients were satisfied with their appointment-making experience.

Across the evidence gathered in support of this mixed-methods evaluation there is a lot of positive feedback in relation to the impact Self-Book can have within practices. It is still a young system and understanding of the full benefits will no doubt develop over time. Ultimately, it appears that the system is successful in delivering the intended benefits to practices, reducing the time required to schedule appointments and releasing pressure upon the primary care system.

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# 10. Appendix

## 10.1. Appendix A: Health economic details

### Net present value

There is a mismatch between the investment decision to implement the programme and the timeframe over which any returns are realised. It is important to note that, in general, returns received earlier are more valuable than returns received later, even accounting for inflation.

The principle is that, in a world without inflation, an investor would rather invest £100 and receive £120 the next day, than invest £100 and receive £120 a year later. This is a social preference and a concept known as the time value of money.

For the investor to accept receiving the returns a year later, they would have to receive an additional amount that is subjective and depends on the individual. One investor may require £130 to be happy to wait one year, whereas another may require £150.

The time value of money, essentially, means that future returns are less valuable than present returns. As a result, an investment decision in the present would be better informed by adjusting for this effect.

The outputs of the health economic analysis in this evaluation, therefore, use discounting on benefits realised in future years to equate them to their present values, in this case, using 2022 as the base year.

While the discounting rate is subjective, it is standard practice in healthcare in England to use a discount rate of 3.5% per year, in line with the rate used (HM Treasury, 2022).

### Benefit streams

To calculate the return on invest of the project, discussions around monetisable impacts of the project took place.

Within the model, these two factors were formed into a benefit stream. A calculation of the difference the intervention has caused on each from the baseline is used to produce a per patient change. This per patient impact is then scaled according to the population seen after implementation of the intervention, this also allows for other populations to be modelled through different scenarios.

This report takes a prudent approach to identify benefits and separates the fiscal savings into the following benefit streams:

- **NHS related cash releasing benefits:** These benefits produce immediate cashable savings to the provider



- **NHS related non-cash releasing benefits:** These benefits are important to reducing demand and strain on services, but a fiscal value cannot be realised without decommissioning of services. Benefits which can be described as non-cash releasing include improvement of time savings.
- **Social benefits:** Social benefits relate to the overall benefit to the public, including, but not limited to, improved health and wellbeing e.g., environmental or transportation costs.
- **Other benefits:** It is important to acknowledge other benefits that might not have an accurate value and may be attributed through qualitative review e.g., staff experience or patient experience.

### ***Adjustments for inflation***

Adjusting for inflation removes the general effects of inflation and presents benefits included within the appraisal in 'real' base year prices rather than in nominal prices (i.e., the first year of the project). Within this appraisal a Gross Domestic Product (GDP) deflator of 2% has been used to convert nominal to real values. Various rates were applied depending on data type, namely:

- Inflation rate (using March 2014 Office for Budget Responsibility forecast; (HM Treasury, 2022))
- Healthcare inflation

### ***Discounting***

Discounting is a technique that enables the comparison of inputs on a consistent basis and accounts for the concept of 'social time preference' (i.e., it allows factors that occur at different time periods to be compared on a "present value" basis). Discounting is applied to all future benefits and is not applied retrospectively.

A discount rate of 3.5% is applied to benefits to deflate outcomes to real terms and reflect the changing value of healthcare within GDP (HM Treasury, 2022). For social outcome streams linked to welfare or utility values (e.g., QALYs), a discount rate of 1.5% is applied as this excludes the change in expected growth per capita over time and only considers health and life effects.

### **Optimism bias**

Optimism bias is defined as "*the tendency for a project's costs and duration to be underestimated and/or benefits to be overestimated*" (MacDonald, 2002). To account for these 'optimistic' estimates, it is recommended that public sector economic analysis applies an optimism bias adjustment to reduce the benefits compared to the calculations using the raw data.

The Unity Insights approach is a development of the model created by the Greater Manchester Combined Authority (GMCA) Research Team (formerly New Economy; HM Treasury, 2014). The GMCA model follows the guidance and principles from HM Treasury's (2022) Green Book and offers a robust and prudent approach to economic analysis.

It is reasonable to assume that the risk of over-optimistic estimates is greater where the data is of low quality (HM Treasury, 2022); such as due to the applicability of the estimate to the modelled pathway, the underlying methodology used for the estimate, or the age of the data source. For optimism bias, each data input is graded according to its quality, and the calculation of a benefit stream is then decreased by an optimism bias factor, decided by the ‘worst’ grade amongst the stream’s data inputs. The Unity Insights optimism bias grades, and the relevant factor that the calculations will be increased or decreased by, are displayed in Table 9.

**Table 9: Unity Insights’ optimism bias confidence grades.**

		Data Source										
		Formal service delivery contract costs		Practitioner monitored costs		Costs developed from ready reckoners		Costs from similar interventions elsewhere		Cost from uncorroborated expert judgement		
		Figures derived from local stats / RCT trials		Figures based on national analysis in similar areas		Figures based on generic national analysis		Figures based on international analysis				
Confidence grade		1		2		3		4		5		
Age of Data	< 2 Years	1	1.1	0%	2.1	10%	3.1	15%	4.1	25%	5.1	40%
	2 - 3 Years	2	1.2	5%	2.2	10%	3.2	15%	4.2	25%	5.2	45%
	3 - 5 Years	3	1.3	10%	2.3	15%	3.3	20%	4.3	30%	5.3	50%
	5 - 10 Years	4	1.4	15%	2.4	25%	3.4	30%	4.4	40%	5.4	55%
	> 10 Years	5	1.5	25%	2.5	30%	3.5	40%	4.5	50%	5.5	60%

In addition to the optimism bias factors applied at the benefit stream level, a further factor of 15% is applied to reduce the benefits. This additional factor is included to protect against bias that may occur in the economic modelling approach and ensures Unity Insight’s role as an impartial, third-party assessor.

The Unity Insights approach to optimism bias is developed from the GMCA model. The GMCA model uses optimism bias to account for all types of uncertainty within the estimations due to sensitivity analysis not being used. The model used in this report takes a more refined approach; accounting for certain types of uncertainty, namely those that are not biased such as random errors, through sensitivity analysis. This reduces the necessity for optimism bias adjustments. In this way, Unity Insights seek to provide more accurate estimates of the true benefits while also providing information on the certainty and variability of the results.

## Sensitivity analysis

A degree of uncertainty in the estimates of the model are accounted for by using sensitivity analysis. It is important to note that the sensitivity differs from optimism bias in that it is applied on each individual assumption or input in the model, rather than by benefit stream as in the case of optimism bias. The method used by Unity Insights is Monte Carlo simulation, which is used to provide a range of estimates of the overall return on investment/net benefit.

Monte Carlo analysis is a modelling technique that simulates the impact of the expected variance in key variables on the output of interest, in this case the net present value return on investment. The approach is best described using an example:

### Step One: Allocation of ranges

Variables of interest are given base-case values (or mean estimates), and an expected range. The range given to each assumption is dependent on the confidence grading applied seen in Table 10.

**Table 10: Unity Insights' sensitivity confidence grades.**

		Data Source											
		Confidence grade		Formal service delivery contract costs		Practitioner monitored costs		Costs developed from ready reckoners		Costs from similar interventions elsewhere		Cost from uncorroborated expert judgement	
				Figures derived from local stats / RCT trials		Figures based on national analysis in similar areas		Figures based on generic national analysis		Figures based on international analysis			
		1		2		3		4		5			
Age of Data	< 2 Years	1	1.1	10%	2.1	10%	3.1	15%	4.1	20%	5.1	25%	
	2 - 3 Years	2	1.2	10%	2.2	15%	3.2	20%	4.2	25%	5.2	25%	
	3 - 5 Years	3	1.3	15%	2.3	20%	3.3	25%	4.3	25%	5.3	30%	
	5 - 10 Years	4	1.4	20%	2.4	25%	3.4	25%	4.4	30%	5.4	35%	
	> 10 Years	5	1.5	25%	2.5	25%	3.5	30%	4.5	35%	5.5	40%	

The example in Table 11 demonstrates the quality-of-life adjustment factor and life expectancy.

**Table 11: Example of sensitivity range allocation.**

Variable	Sensitivity Grading	Range Applied	Lower range estimate	Base-case / mean estimate	Upper range estimate
Quality of life adjustment factor	2.4	+/- 25%	0.420	0.565	0.70
Life expectancy (years)	4.4	+/- 30%	4.41	6.30	8.19

### Step Two: Allocation of a distribution shape

All data has a shape to its distribution. If there is equal likelihood of any value within a range being drawn, then a rectangular distribution can be used (so called because a graph of the probability of any specific value being drawn would appear to be a rectangle). If there is a lower likelihood of a value at the extreme ends of the range being drawn, then a triangular distribution could be used.

If there is reason to believe the distribution meets the statistical qualities required to be defined as normal, Poisson, etc, then these can be applied. In this study, we have generally applied triangular distributions as this best reflects the ranges used and diminishing probabilities of more extreme ends. Where a different distribution has been used, it is expressly noted in the text.

### Step Three: Random selection of values within the range

The model selects at random a value for each variable from within the range between the upper and lower estimate and calculates the outcome from each draw, considering the distribution shape selected and therefore the probability of any value being drawn.

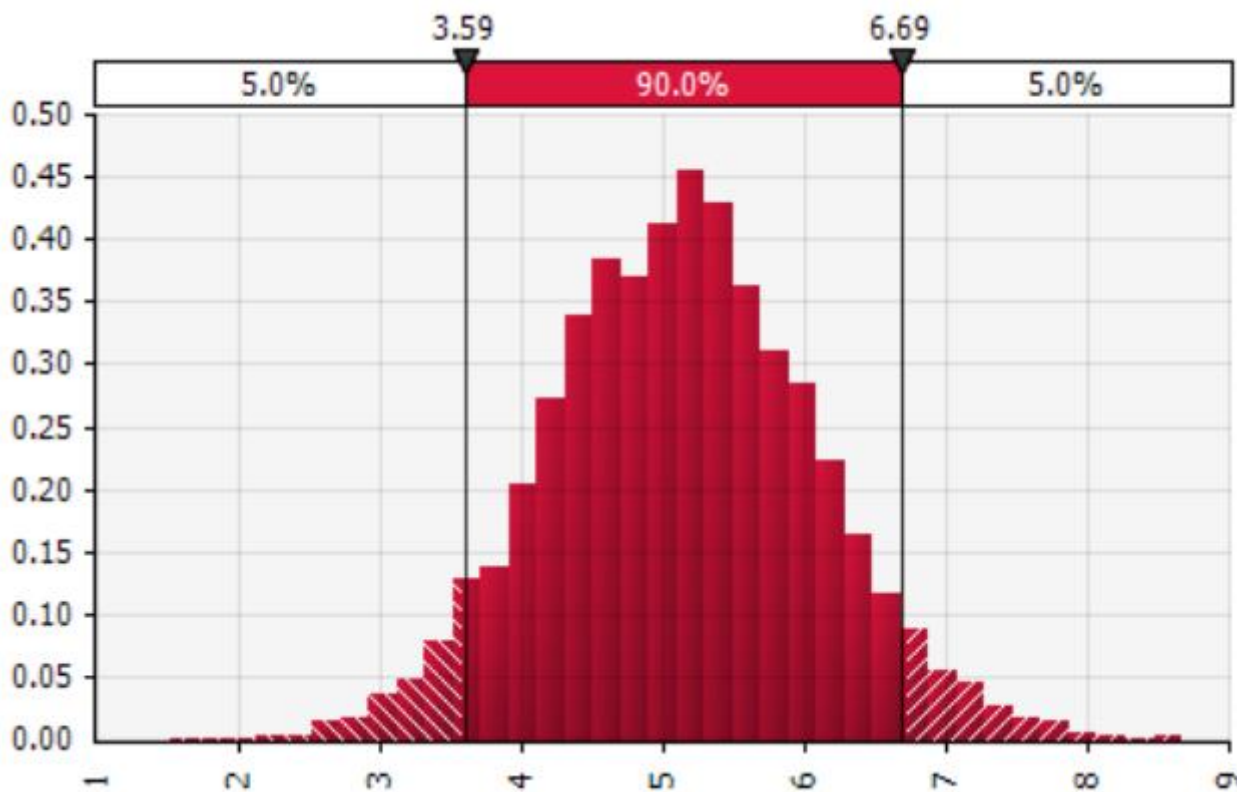
### Step Four: Repetition

Five draws are given in Table 12, using a rectangular distribution. These deliver estimates lying between £40,500 and £105,000. The draw is repeated thousands of times. In this evaluation we use 10,000 runs as standard.

**Table 12: Example of random variation within Monte Carlo simulation.**

Variable	Draw 1	Draw 2	Draw 3	Draw 4	Draw 5
Quality of life adjustment factor	0.45	0.50	0.55	0.60	0.70
Life expectancy (years)	4.5	5.0	5.5	6.0	7.5
Quality of Life Year monetary value	£20,000	£20,000	£20,000	£20,000	£20,000
Benefit (lives saved X value of lives saved)	£40,500	£50,000	£60,500	£72,000	£105,000

Creating 10,000 estimates allows the creation of a distribution of possible outcomes from the draws made. From this distribution we can then compute the range within which we expect 90% of the observations from the draws to fall. This is called the 90% confidence interval, illustrated in Figure 30.



**Figure 30: Illustration of sensitivity analysis.**

The source for many of the data inputs in the model may also include a confidence interval, such as if the source is an academic study. In these cases, the confidence interval from the data source is used to provide the maximum and minimum ranges for the data input in the sensitivity analysis. Where no confidence interval is provided, the quality of the data is graded in a similar way to optimism bias to express the degree of certainty that Unity Insights has in the estimates.

## 10.2. Appendix B: Practice Sample

**Table 13: Practices that took part in the interview and surveys.**

	Group	List Size	Location	IMD (Deprivation Decile 1-10)
Practice A	Survey	9,017	North Yorkshire	9
Practice B	Survey	11,592	Hertfordshire	8
Practice C	Survey	14,832	Essex	9
Practice D	Survey	11,699	Worcestershire	2
Practice E	Survey	11,782	Worcestershire	7
Practice F	Survey	34,008	Cheshire	10
Practice G	Survey	8,199	Middlesex	7
Practice H	Survey	15,852	Essex	7
Practice I	Survey	25,294	Essex	4
Practice J	Survey	14,686	Warwickshire	5
Practice K	Survey	36,293	Hampshire	5
Practice L	Survey	27,390	Hampshire	4
Practice M	Survey/ Interview	26,560	Middlesex	7
Practice N	Survey	14,010	Somerset	6
Practice O	Interview	14,537	Cheshire	10
Practice P	Interview	15,387	Middlesex	3
Practice Q	Interview	11,782	Worcestershire	7
Practice R	Interview	28,982	Worcestershire	3
Practice S	Interview	7,196	Middlesex	4

## 10.3. Appendix C: Survey

### Survey Questions

You recently booked an appointment at the GP Practice using our new online booking service (Accurx the online booking service) via a link you received by SMS. Your feedback on this would be really valuable in helping us improve this service and make access to appointments better. We would be grateful if you could take 2 minutes to complete a short survey.

#### Access

##### What is your Gender?

- M/F/O

##### How old are you?

- 18 to 24
- 25 to 34
- 35 to 44
- 45 to 54
- 55 to 64
- 65-74
- 75-84
- Over 85

##### Have you used the online booking service to book an appointment at your GP Practice recently?

- Yes I booked a Flu appointment
- Yes I booked a COVID vaccine appointment
- Yes I booked another appointment
- No I have not used the online booking service

##### If you have not used the online booking service to book an appointment at your GP Practice, please tell us why.

- I didn't get invited
- I didn't want the appointment
- There were no appointments available when I tried to book
- There were no times that worked for me
- The link expired
- I called my practice instead



**How easy was it to book an appointment using the online booking service?**

- Very easy
- Fairly easy
- Not very easy
- Not at all easy

**For non-vaccine appointments:**

**When you used the online booking service, how satisfied were you with the general practice appointment times that were available to You? (GPPS)**

- Very satisfied
- Fairly satisfied
- Neither satisfied nor dissatisfied
- Fairly dissatisfied
- Very dissatisfied

**For non-vaccine appointments:**

**When you used the online booking service, were you satisfied with the type of appointment you were offered (e.g. Face to Face/ Telephone)? (GPPS)**

Yes, and I accepted an appointment

- No, but I still took an appointment
- No, and I did not take an appointment
- I was not offered an appointment

***Comparison to before the online booking service implementation***

**For non-vaccine appointments:**

**How long after initially trying to book the appointment did the appointment take place?**

- On the same day
- On the next day
- A few days later
- A week or more later
- Can't remember

**Compared to before your practice was using the online booking service, has your ability to access GP appointments improved?**

- Greatly Improved
- Improved

- No difference
- Worse
- Much Worse

**Compared to phoning your GP Surgery to book an appointment, how did you find the online booking service?**

- Much Easier
- Easier
- No different than telephoning
- Harder
- Much Harder

### ***Satisfaction***

**Overall, how would you describe your experience of making an appointment using the online booking service?**

- Very good
- Fairly good
- Neither good nor poor
- Fairly poor
- Very poor

**Next time you need to book an appointment at the GP surgery, how likely are you to use the online booking service if it was offered to you?**

- 0 - Not at all Likely
- 10 - Extremely Likely

**How likely is it that you would recommend using the online booking service to a friend or colleague when booking their GP appointment??**

- 0 - Not at all Likely
- 10 - Extremely Likely

## Survey Results

The following section provides the raw responses from the survey responses, and the aggregated responses (i.e., Not at all easy + Not very easy = Not Easy).

### How easy was it to book an appointment using the online booking service?

Other appointments				Vaccination appointments			
Not at all easy	7%	<b>Not easy</b>	<b>16%</b>	Not at all easy	1%	<b>Not easy</b>	<b>6%</b>
Not very easy	9%			Not very easy	5%		
N/A	-	<b>N/A</b>	-	N/A	-	<b>N/A</b>	-
Fairly easy	39%	<b>Easy</b>	<b>84%</b>	Fairly easy	28%	<b>Easy</b>	<b>94%</b>
Very easy	46%			Very easy	66%		

### Overall, how would you describe your experience of making an appointment using the online booking service?

Other appointments				Vaccination appointments			
Very poor	6%	<b>Poor</b>	<b>14%</b>	Very poor	3%	<b>Poor</b>	<b>6%</b>
Fairly poor	9%			Fairly poor	4%		
Neither good nor poor	19%	<b>Neither good nor poor</b>	<b>19%</b>	Neither good nor poor	11%	<b>Neither good nor poor</b>	<b>11%</b>
Fairly good	37%	<b>Good</b>	<b>67%</b>	Fairly good	32%	<b>Good</b>	<b>82%</b>
Very good	30%			Very good	50%		

**Compared to phoning your GP Surgery to book an appointment, how did you find the online booking service?**

Other appointments				Vaccination appointments			
Much harder	6%	<b>Harder</b>	<b>17%</b>	Much harder	3%	<b>Harder</b>	<b>8%</b>
Harder	10%			Harder	6%		
No different than telephoning	20%	<b>Neither good nor poor</b>	<b>20%</b>	No different than telephoning	15%	<b>Neither good nor poor</b>	<b>15%</b>
Easier	33%	<b>Easier</b>	<b>63%</b>	Easier	34%	<b>Easier</b>	<b>77%</b>
Much easier	30%			Much easier	43%		

**Next time you need to book an appointment at the GP surgery, how likely are you to use the online booking service if it was offered to you?**

Other appointments				Vaccination appointments			
Very unlikely	7%	<b>Unlikely</b>	<b>16%</b>	Very unlikely	8%	<b>Unlikely</b>	<b>13%</b>
Unlikely	9%			Unlikely	6%		
Neutral	22%	<b>Neutral</b>	<b>22%</b>	Neutral	11%	<b>Neutral</b>	<b>19%</b>
Likely	24%	<b>Likely</b>	<b>62%</b>	Likely	18%	<b>Likely</b>	<b>68%</b>
Very likely	38%			Very likely	50%		

**How likely is it that you would recommend using the online booking service to a friend or colleague when booking their GP appointment?**

Other appointments				Vaccination appointments			
Very unlikely	13%	<b>Unlikely</b>	<b>20%</b>	Very unlikely	9%	<b>Unlikely</b>	<b>15%</b>
Unlikely	7%			Unlikely	6%		
Neutral	25%	<b>Neutral</b>	<b>25%</b>	Neutral	24%	<b>Neutral</b>	<b>24%</b>
Likely	23%	<b>Likely</b>	<b>55%</b>	Likely	19%	<b>Likely</b>	<b>61%</b>
Very likely	32%			Very likely	42%		

**Compared to before your practice was using the online booking service, has your ability to access GP appointments improved?**

Other appointments				Vaccination appointments			
Much Worse	12%	<b>Worse</b>	<b>25%</b>	Much Worse	2%	<b>Worse</b>	<b>5%</b>
Worse	14%			Worse	3%		
No difference	28%	<b>No difference</b>	<b>28%</b>	No difference	25%	<b>No difference</b>	<b>25%</b>
Improved	36%	<b>Improved</b>	<b>47%</b>	Improved	45%	<b>Improved</b>	<b>70%</b>
Greatly improved	11%			Greatly improved	24%		

## 10.4. Appendix D: Interview Guide

We are interviewing practice staff members to find out about their experiences of using the Accurx Self-Book system. We have a series of questions to ask that focus on different areas.

- Can you tell me about how Self-Book is used in your practice?
  - Specific workflows (i.e., Flu/Vaccine) vs General Clinics
  - How long has the practice been using Self-Book
  - How long did it take staff to familiarise themselves with the system?
  - How easy / difficult is it to use?
- Do you use Self-Book for any long term condition management (or have plans to)?
- Can you describe how Self-Book is used as part of your own day-to-day work in your role?
- Can you describe how this/these workflows were carried out before your practice used Self-Book?
- What are the benefits of using the new Self-Book workflows?
- Has Self-Book resulted in time-saving in your practice?
- Does Self-Book save you any time during your day-to-day work, and if so how?
  - Can you estimate how much time?
  - What kind of tasks do you do less of now?
  - What kinds of tasks do you do more of now / have more time to do?
- For the tasks that you are doing less of now, can you describe whether this has impacted your stress levels at work?
- Has Self-Book had any impact on how you plan your capacity/clinics?
- Has Self-Book had any effect on making sure the right patients are seen in the appropriate clinics?

Now I am going to ask you about patients' experiences of using Self-Book.

- What has patients' response been to using Self-Book?
- Are there any situations when patients have not been able to or wanted to use Self-Book?
- Are there any patients that you would not offer a Self-Book appointment to?
- Can you think of any examples of when a Self-Book has not been appropriate for a patient?
- Has Self-Book freed up staff's time to help other patients who can not access digital tools?
- Can you describe any barriers patients have to using a Self-Book from your experience?
- Has Self-Book improved access to primary care for your patients?

Now I am going to ask you about your overall experience of using Self-Book?

- Overall, do you have a positive or negative experience of using Self-Book?
- Have there been any unintended consequences of using Self-Book?
- Has Self-Book improved or worsened your day-to-day work as a X in General Practice?
- Are there any features for Self-Book that you would like added or would improve its use?
- Would you recommend Self-Book to other practices?



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