Independent evaluation of Dorset Integrated Care System Innovation for Healthcare Inequalities Programme (InHIP)

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DISCLAIMER

This report presents the findings of an independent evaluation of Dorset Integrated Care System (ICS) Innovation for Healthcare Inequalities Programme (InHIP). The findings of this independent evaluation are those of the authors and do not necessarily represent the views of Dorset ICS.

DECLARATION OF INTEREST STATEMENT

Health Innovation Wessex (HIW) supports innovators to bring their innovations to the NHS as well as provide an evaluation service more broadly to our members and others. On occasion, we evaluate innovations that we have also supported. Whilst these evaluations are independent, for transparency we disclose our dual role where applicable. The evaluation was undertaken by the HIW Insight team. The HIW Innovation Adoption team was also involved with the Dorset InHIP project by supporting the funding application and implementation of the project. HIW has worked with C the Signs[1] since 2022 following an interest from a system partner to collaborate on a grant application. As part of the InHIP project implementation, the jointly funded Cancer Innovation Programme with Wessex Cancer Alliance has supported the Dorset Integrated Care System (ICS) Cancer Programme hosted by NHS Dorset Integrated Care Board to rollout the C the Signs software across primary care in Dorset to support clinical decisions for patients with suspected cancer.

ACKNOWLEDGEMENTS

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[1] C the Signs, https://cthesigns.co.uk/. Accessed February 20247

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EXECUTIVE SUMMARY

Background: The Innovation for Healthcare Inequalities Programme (InHIP) delivered within Dorset Integrated Care System set out to improve early cancer diagnosis for colorectal cancer (CRC), particularly amongst coastal communities which experience some of the highest levels of health inequality. The overall aims of the project were to: a) improve earlier and faster diagnosis of CRC in the targeted deprived coastal communities by enabling Primary Care Networks (PCNs) in Dorset to manage residents who are most at risk of CRC and b) increase the use of faecal immunochemical test (FIT) kits to aid CRC diagnosis. Interventions to address these aims included county-wide deployment of clinical decision support software for clinicians called C the Signs and development of educational interventions to increase public awareness, usage and completion rates of FIT kits. Health Innovation Wessex was commissioned to undertake an evaluation of this project.

Evaluation Approach: The evaluation used a mixed-method approach to understand the outcomes and impact of the InHIP. It sought to address questions regarding Dorset residents' perceptions of using a FIT kit by collecting qualitative data using an online survey and focus groups. Quantitative data, supplied by C the Signs and Dorset Intelligence and Insight Service (DiiS), was analysed to assess the impact of C the Signs by comparing FIT kit completion rates between GP practices with and without C the Signs system, accessibility of FIT kits, and short-term outcomes for CRC in the under-served communities.

Findings and Recommendations: Overall, the perceptions on using a FIT kit and the feedback on the developed educational intervention were positive. The public perceptions and feedback were based on a small number of participants. This was due to challenges and delay in launching the educational interventions, causing a much-reduced data collection period than planned. Based on the available quantitative data within the timeframe of the project, there was no significant observable impact of C the Signs on FIT kit completion rates when compared with GP practices without C the Signs deployment. However, the deployment of C the Signs was staggered across Dorset and those GP practices that deployed C the Signs may not have had enough time to fully adopt the system before the impact was evaluated. Due to significant limitations in the data including low numbers of valid quantitative data sets to conduct sub-group analyses, the evaluation was unable to appropriately address the project's impact on accessibility of FIT kits and short-term outcomes for CRC across the under-served communities. Main recommendations include continuation of public engagement with the under-served communities to further collect their perceptions on the use of FIT kits, and their feedback on the educational intervention. Additional quantitative data collection over a longer period is also recommended to reassess the impact of C the Signs on FIT kit completion rates, accessibility and diagnosis of CRC.

BACKGROUND AND OVERVIEW

Colorectal cancer (CRC) is the fourth most common cancer affecting adults in the UK[2]. Mortality from CRC disproportionally affects those living in areas of high social deprivation, particularly for males[2]. Dorset, whilst considered an affluent area, has a population that is older than the national average and with significant pockets of high social deprivation in its coastal and rural communities[3].

NHS England's ambition is to diagnose 75% of cancers at an early stage (stage I or II) by 2028[4]. In line with this ambition, the Innovation for Healthcare Inequalities Programme (InHIP) in Dorset set out to improve early diagnosis for CRC, particularly amongst coastal communities which experience some of the greatest levels of inequality. The InHIP Dorset project team included clinical and non-clinical experts from Health Innovation Wessex (HIW) Innovation Adoption team, Wessex Cancer Alliance and Dorset ICS Cancer Programme.

The InHIP Dorset project team identified that Dorset primary care teams found it challenging to monitor the completion of faecal immunochemical tests (FIT), a recommended test from the National Institute for Health and Care Excellence to guide referral for suspected CRC[4]. The FIT is used in asymptomatic people through the bowel cancer screening programme and in symptomatic patients in primary care to investigate suspected CRC[4]. The use of FIT for symptomatic patients in primary care supports earlier diagnosis of CRC; the FIT results help primary care to identify who should be sent for further tests so that these people can be prioritised more effectively and those who are less likely to have CRC can avoid unnecessary tests[4]. The overall aim of InHIP in Dorset was to improve earlier and faster diagnosis of CRC in the targeted deprived coastal communities by:

- Enabling Primary Care Networks (PCNs) to identify, monitor and support residents who are most at risk of CRC.
- Reducing variation in the completion rate of symptomatic FIT tests in coastal communities to improve early diagnosis of CRC.

The project team's objectives to achieve the above aims were delivered in three distinct work packages:

1. Deployment of clinical decision support software called C the Signs across PCNs in Dorset[5].
2. Development of educational interventions based on initial public opinion through focus groups and survey.
3. Evaluation of the chosen educational interventions to increase awareness and use of FIT kits.

[2] Cancer Research UK, https://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/bowel-cancer#heading-Zero, Accessed June 2023.
[3] Dorset Council, https://mapping.dorsetcouncil.gov.uk/statistics-and-insights/Topics/Topic/Deprivation. Accessed June 2023.
[4] NHS England, https://www.england.nhs.uk/cancer/early-diagnosis/. Accessed June 2023.
[5] NHS Dorset, https://nhsdorset.nhs.uk/new-pilot-to-improve-cancer-outcomes-and-tackle-inequalities-launches-in-dorset/. Accessed February 2024.

This report is based on findings from work packages 1 (deployment of C the Signs software) and 3 (public feedback on the educational interventions). The output of work package 2 (development of educational interventions) was reported back to Dorset ICS Cancer Programme separately in September 2023 but is included in **Supplementary Document 1** for completeness[6].

WORK PACKAGE 1: DEPLOYMENT OF C THE SIGNS

C the Signs is a clinical decision support tool that uses machine learning together with the latest guidelines and research to support healthcare professionals to spot the earliest signs, symptoms, and risk factors for cancer[5]. The software includes a dashboard for clinicians to monitor when a patient requires a FIT kit and whether/when it has been returned. C the Signs software deployment took place in early August 2023 in all Dorset GP practices. The focus of the evaluation was on the overall FIT kit completion rates since the deployment of C the Signs. The evaluation of the implementation process, uptake and implications of C the Signs deployment was out of scope of this evaluation.

WORK PACKAGE 2: DEVELOPMENT OF EDUCATIONAL INTERVENTIONS

The development of an educational intervention through public engagement took place during May and August 2023. During this phase, Dorset ICS Cancer Programme reached out to under-served communities to conduct community focus groups and an online survey to capture public awareness and understanding of CRC and the FIT kit. The data from four focus groups, including engagement with fishermen and farmers, and 882 survey responses were submitted to HIW for baseline analysis. HIW presented the findings to the InHIP project team in September 2023 to inform their decisions about which intervention to implement. Further details and findings from this work package are provided in **Supplementary Document 1**.

WORK PACKAGE 3: EVALUATION OF THE EDUCATIONAL INTERVENTION

Based on the outcome of work package 2, Dorset ICS Cancer Programme selected two FIT kit instructional videos as the educational interventions. The two videos were:

- Video 1: Completing a FIT from your GP (non-screening) designed by Greater Manchester Cancer Alliance
- Video 2: OC-Sensor: How to do your FIT sample: FITPac designed by Mast Group Limited

The focus of work package 3 was to evaluate the selected educational interventions based on public feedback. There was a significant delay to implementing the educational intervention due to difficulty with focus group re-engagement and requirements for approval of social media assets. This also caused additional challenges with organising focus groups within the qualitative data collection

[6] HIW (formerly known as Wessex Academic Health Science Network, Wessex AHSN) was renamed on 1 October 2023. Evaluation outputs before October 2023 are historically reserved in Wessex AHSN branding.

period. The planned intervention phase (November and December 2023) was therefore reduced to December 2023 only.

EVALUATION QUESTIONS

The evaluation aimed to collect both quantitative data from the C the Signs campaign and qualitative data from Dorset residents' feedback on the educational intervention, to understand the outcomes and impact of InHIP. The primary questions were:

1. What views do members of under-served communities have regarding the developed educational interventions, and what are their perceptions of using a FIT kit to support the early detection of CRC?
2. Is there evidence to suggest that the project increased the completion of FIT kits in the targeted deprived communities?
3. Is there evidence to suggest that the project made access to FIT kits for communities across Dorset more equitable?
4. Is there evidence to suggest that the project has improved short-term outcomes for patients with CRC in the targeted deprived communities?

The evaluation employed a mixed methods approach by gathering both quantitative and qualitative data. Quantitative data was supplied by C the Signs and the Dorset Intelligence and Insight Service (DiiS). Qualitative data was collected from an online survey for members of the public and a community focus group. More details on the evaluation methods are provided below.

QUANTITATIVE EVALUATION METHODS

QUANTITATIVE DATA SOURCES

There were two sources of quantitative data: the data set supplied by C the Signs and a data set supplied by DiiS. Data supplied by C the Signs included a list of GP practices in Dorset which deployed the software and their 'go-live' dates. The evaluation team and C the Signs jointly determined the 'go live' date as when a GP practice actioned their first FIT kit to transfer the patient to the C the Signs dashboard for safety-netting and tracking. The date range of the data set received from C the Signs was August to November 2023.

DiiS supplied the second source of data. This data set included GP appointments when FIT kits were provided to patients, lab test results of returned FIT kits, and stage classification of diagnosed CRC cases. The date range of the DiiS data set was 01 August 2022 to 31 December 2023.

QUANTITATIVE ANALYSIS PROCESS

Data required for the evaluation was co-designed by the evaluation team and DiiS. As part of the data processing and analysis, two data sets from C the Signs and DiiS needed to be joined. Details of the two data sets and underlying fields are shown in **Appendix A**. Quantitative data sets. The data

definitions and pre-processing of the data sets are described in **Appendix B**. Data definitions and pre-processing. The evaluation team coded the pre-processing and analysis scripts in Python (v3.9.7) programming language and sent this to DiiS for data process and analysis. Anonymised results and outputs were returned to the evaluation team.

PROPENSITY SCORE MATCHING

The evaluation team applied a method called propensity score matching (PSM)[7] to emulate a 'matched' group of patient cases from GP practices with C the Signs (any FIT kit provided to patients after the 'go live' date from a GP practice with C the Signs) and a group of patient cases from GP practices without C the Signs (any FIT kit provided to patients). The matching process was based on the selected variables listed below:

- Location of GP practice (coastal or non-coastal)
- Number of long-term conditions per patient
- Patient's previous history cancer prior to the FIT event
- Patient's gender identity
- Level of deprivation within patient's neighbourhood[8]
- Patient's age at the time of the GP appointment when a FIT kit was provided[9]
- Patient's ethnic background[9]

The evaluation team used the PSM method to minimise the disparity in variables between the two groups which could alter the observable impact from the deployment of C the Signs. A more detailed description of the PSM method is provided in **Appendix C**. Propensity score matching process.

DESCRIPTIVE REVIEW OF AGGREGATE DATA

As part of the analysis on FIT kit completion rates, HIW reviewed the volumes of non-elective admissions, split by hospital admission cases. In addition, HIW analysed the time from cancer referral to diagnosis and the stage classification of a diagnosed cancer for any visible impact.

QUANTITATIVE FINDINGS

The evaluation team analysed data sets from C the Signs and DiiS to answer the evaluation questions 2, 3 and 4. The summary of the main findings from the quantitative data is described below.

- Q2. Is there evidence to suggest that the project increased the completion of FIT kits in the targeted deprived communities?

[7] Rosenbaum P.R. & Rubin D.B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika*, 70(1):41–55.

[8] Level of deprivation was determined by the official measure of multiple deprivation experienced by people living in a neighbourhood in England. Ministry of Housing, Communities & Local Government, The English Indices of Deprivation 2019 (publishing.service.gov.uk). Accessed June 2023.

[9] While refining the PSM model, age and ethnicity variables were removed from the model as they were disproportionately impacting the overall balance.

- Q3. Is there evidence to suggest that the project made access to FIT kits for communities across Dorset more equitable?
- Q4. Is there evidence to suggest that the project has improved short-term outcomes for patients with CRC in the targeted deprived communities?

FIT KIT COMPLETION RATES (EVALUATION QUESTION 2)

There was a total of 45 GP practices with a 'go-live' date (a date when a GP practice actioned their first FIT kit to transfer the patient to the C the Signs system) during August and November 2023. The monthly record of C the Signs 'go-live' date is listed in **Table 1**.

Table 1. Monthly record of GP practices with C the Signs 'go-live' date

Month	Number of GP practice with 'go-live' date
August 2023	21
September 2023	13
October 2023	7
November 2023	4
Total	**45**

A total of 6,442 valid patient cases were collected from GP practices without C the Signs and a total of 3,827 valid patient cases were collected from GP practices with C the Signs. The evaluation team applied a PSM method to match patient cases from GP practices with and without C the Signs. Based on this early data of 3,827 pair-matched valid patient cases, the statistical analysis indicated that there is no difference in FIT kit completion rate between patients returning a FIT kit from GP practices with or without C the Signs deployed. For an explanation of the PSM findings and accompanying graphs, see **Appendix C**. Propensity score matching process. It is important to note that the deployment of C the Signs was staggered across PCNs during August and November 2023 and the quantitative data collection period ended in December 2023. GP practices with 'go-live' dates of C the Signs had a narrow timeframe of one to four months to embed the system into their clinical pathway for CRC. Therefore, the implementation process and the adoption of the C the Signs system during this period may have confounded the result at this early stage of system deployment. The evaluation of the implementation process, uptake and implications of C the Signs deployment was out of scope of this evaluation.

IMPACT OF C THE SIGNS ON FIT KIT ACCESSIBILITY (EVALUATION QUESTION 3)

The evaluation team aimed to analyse the aggregated data provided by DiiS to answer evaluation question 3 (evidence of improved equity of access to FIT kits across Dorset communities). To quantify any impact from C the Signs implementation, the evaluation team considered the following indicators for the analysis:

- Any changes in the resulting CRC diagnosis for non-elective admission cases presenting via the emergency department.
- Time taken from cancer referral to diagnosis.
- Distribution of stage classification of CRC diagnosed based on FIT issued from GP practices with or without C the Signs.

These indicators were calculated based on the level of deprivation within patient's neighbourhood[10]. Initial analysis returned a high variability of data across patient cases and a low number of valid patient cases in some of the neighbourhoods. Due to patient identifiable data disclosure risk inherent in the presentation of small numbers, the evaluation team applied a suppression rule of seven or fewer individual cases[11]. Consequently, it was deemed inappropriate to present the findings with small numbers that are not representative of the communities across Dorset. Therefore, it has not been possible to evidence improved equity of access to FIT or to attribute improvements in the stage of diagnosis of CRC following the provision of a FIT kit by practices where C the Signs was deployed. A longer data collection period is required to increase the volume of data and thus reduce the likelihood of small numbers.

STAGE OF CRC DIAGNOSIS FOLLOWING A FIT RESULT (EVALUATION QUESTION 4)

The aggregated data provided by DiiS was also analysed to address the evaluation question 4 (the short-term impact on CRC diagnosis). The evaluation team calculated the distribution of stage classification of confirmed CRC diagnosis following the results from FIT kits issued by GP practices with and without C the Signs.

GP practices where C the Signs was not deployed:

- The number of confirmed cases of CRC at all stages (1, 2, 3 and 4) was fewer than seven for all practices.

GP practices where C the Signs was deployed:

- Stage 1 diagnosis - fewer than seven cases
- Stage 2 diagnosis - seven cases
- Stage 3 diagnosis - eight cases
- Stage 4 diagnosis - fewer than seven cases

The valid cases of confirmed diagnoses were therefore deemed inappropriate to further analyse by area of deprivation due to the inherent risk of disclosing patient identifiable data caused by such low numbers. Therefore, it is not possible to answer evaluation question 4 with the available data

[10] Level of deprivation was determined by the official measure of multiple deprivation experienced by people living in a neighbourhood in England. Ministry of Housing, Communities & Local Government, The English Indices of Deprivation 2019 (publishing.service.gov.uk). Accessed June 2023.
[11] NHSE Digital. Data Quality Maturity Index (DQMI) methodology: Chapter 4. Suppression rules. Last edited: 8 October 2021. https://digital.nhs.uk/data-and-information/data-tools-and-services/data-services/data-quality/data-quality-maturity-index-methodology/suppression-rules Accessed June 2023.

provided by DiiS at this moment in time. A larger data set, collected over a longer time period is needed to confidently answer this evaluation question.

QUALITATIVE EVALUATION METHODS

Qualitative methods consisted of data collection using an online feedback survey and one community focus group. The aim of the survey was to collect the public's perspectives on the two FIT kit instructional videos selected as part of work package 3 (to evaluate the selected educational interventions based on public feedback). The aim of the focus group was to collect the perspectives on the same instructional videos but from those in the under-served communities.

ONLINE FEEDBACK SURVEY

The online feedback survey was designed to capture the views of Dorset residents on two FIT kit instructional videos (see

Appendix D. Online feedback survey). The survey was created by HIW using Microsoft Forms and disseminated via NHS Dorset's social media accounts. The launch of the online feedback survey was delayed due to competing priorities within the Dorset ICS Cancer Programme and requirements for approval of social media assets. The survey was open for public response between 19 and 31 December 2023. Responses were collected anonymously.

COMMUNITY FOCUS GROUP

Initially, three to four focus groups with different community groups were planned for the evaluation. Contacts from the four focus groups carried out as part of work package 2 were invited to take part in the evaluation stage of the project. However, due to the availability of groups from the community, only one focus group was delivered during the data collection period. Dorset ICS Cancer Programme, through their existing contacts, organised the face-to-face focus group with local construction company employees. Participants included some who had participated the previous focus group and some participating for the first time. An evaluator from HIW facilitated the session and encouraged all participants to contribute to the discussion (see **Appendix E**. Focus group topic guide). The focus group was delivered in December 2023.

The content of the focus group followed a similar layout as the online feedback survey with additional opportunity for the participants to discuss their thoughts on the two videos. During the focus group, paper copies of the survey were provided to each participant to complete (see **Appendix F**. Paper copy survey used at focus group). The completed paper copies of the survey were returned anonymously to the facilitator at the end of the session. Each survey response was then manually entered into the online survey by the facilitator. The focus group discussion was audio recorded for transcription (via Microsoft Word transcription) to ensure accuracy in qualitative analysis. The transcription process replaced participant names with participant codes to protect confidentiality.

QUALITATIVE ANALYSIS PROCESS

All feedback survey responses were downloaded from Microsoft Forms into a Microsoft Excel spreadsheet. Due to the low response rate, the evaluation team undertook descriptive analysis of the data collected from the survey and undertook narrative analysis of the focus group transcript to draw out the key discussion points.

QUALITATIVE FINDINGS: PERCEPTIONS OF FIT KIT INSTRUCTIONAL VIDEOS

Qualitative data addresses evaluation question 1: What views do members of under-served communities have regarding the developed educational interventions and what are their perceptions of using a FIT kit to support the early detection of CRC?

There was a total of ten survey responses including seven responses collected from the focus group participants. The Dorset ICS Cancer Programme team also collected 17 survey responses during other engagement events in Dorset; unfortunately, this data was incomplete and was therefore subsequently removed from the analysis. For simplicity, this section combines findings from both the survey and focus group discussion.

PARTICIPANT DEMOGRAPHICS AND CHARACTERISTICS

Geographically, participants' residence included Dorchester (n=3), Poole (n=2), Bridport (n=1), Portland (n=1), Preston (n=1) and Weymouth (n=1). One participant did not disclose their address. Most of the participants were in their 40s (n=7), with other participants in their 50s (n=2) and one participant aged within the range of 18 and 29. The gender distribution was dominantly male (n=7) with few females (n=2) and one participant did not disclose gender. All but one participant noted their ethnicity as white (n=9); one participant did not disclose ethnicity. All participants did not consider themselves to have a disability. Only one participant stated that they had been given a FIT kit by their GP before. All other participants (n=9) had not been given a FIT kit by their GP before.

FEEDBACK ON THE INSTRUCTIONAL VIDEOS

Participants were asked to respond to a set of statements about the two instructional videos, by stating whether they strongly disagree, disagree, neither agree nor disagree, agree or strongly agree.

The overall response distribution is shown in **Figure 1**.

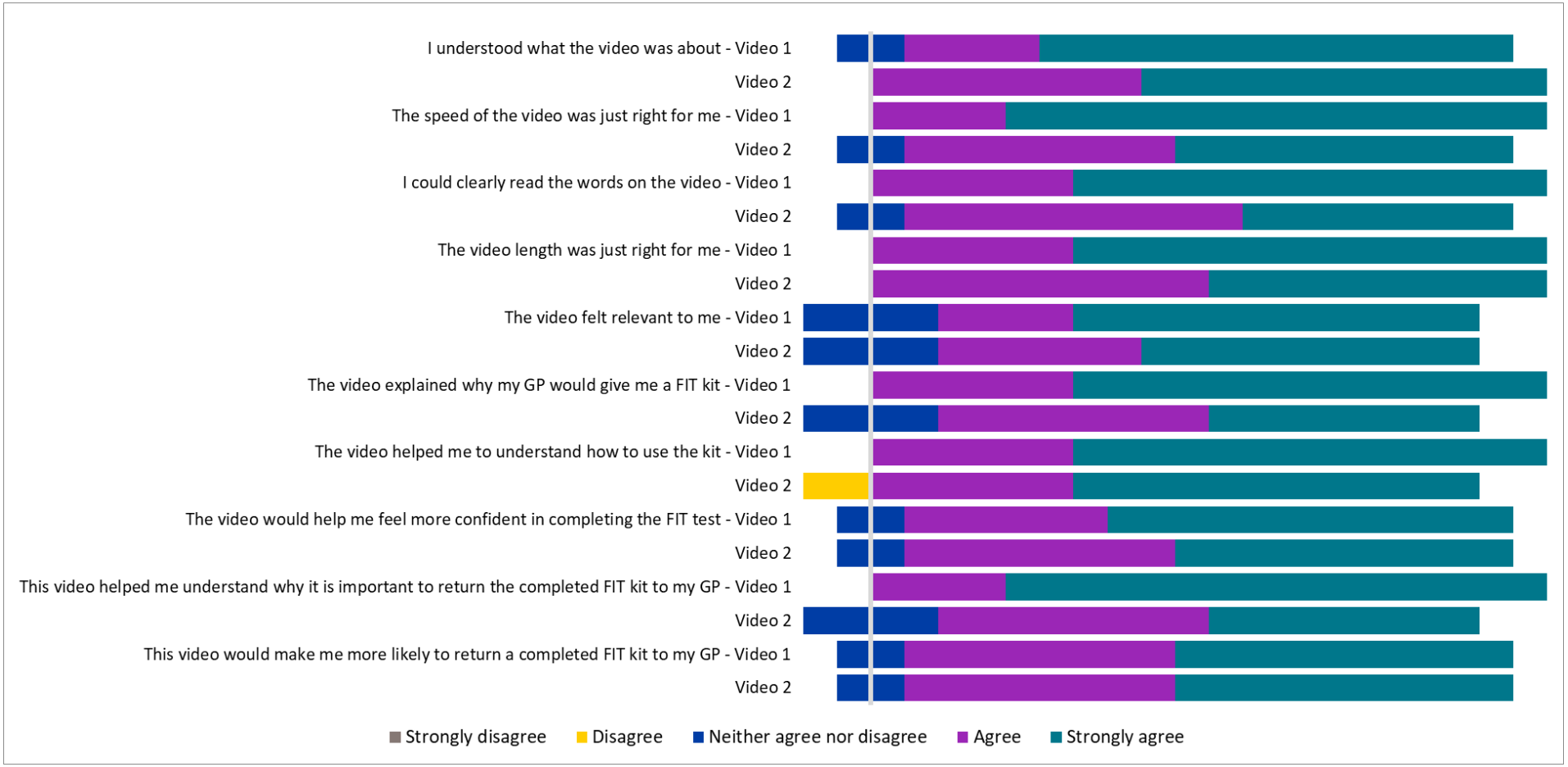


Figure 1. Feedback survey response on the two FIT kit instructional videos (video 1: Greater Manchester Cancer Alliance, Completing a FIT from your GP (non-screening); video 2: Mast Group Limited, OC-Sensor: How to do your FIT sample: FITPac)

Overall, both instructional videos were positively received. Most of the responses indicated strong agreement with the statements around the format and delivery of the videos for both videos. Most responses indicated with strong agreement that both videos were helpful and useful for understanding the reason for the FIT kit, how to use it, and the importance of completing the kit. Video 1 received more positive sentiments compared to video 2, although only marginally. The survey included a free text option for participants to leave comments explaining their responses to both videos. Only one comment was left by an online responder, which noted that video 1 could have been "shorter, but otherwise very clear."

The following sub-sections highlight the focus group participants' opinions of the two videos. Participant codes (Px) were used for quotations to maintain participants' confidentiality.

Overall, all focus group participants felt that the information on both videos was informative. Some participants expressed a general reluctance to handling their own poo:

> *"I kind of don't wanna do this, to do with your own [poo]. I don't know."* P2

Despite the reluctance, all participants agreed that the videos were helpful for understanding the importance of completing the FIT kit.

FEEDBACK ON VIDEO 1

Video 1: Greater Manchester Cancer Alliance, Completing a FIT from your GP (non-screening).

All focus group participants responded more positively to the content and presentation of video 1 compared to video 2. The main reasons for this were the simple visual content, clear instruction, and voiceover of the instruction:

> *"Yeah, you got someone speaking [in video 1]. You've got audio as well."* P6

Three participants noted their hesitancy on pooing in a container as instructed:

> *"…like, where can you get your container to [poo] in? I'm just saying that [pooing in a container] might really put people off. Yeah… make another excuse not to do [the test]."* P4

FEEDBACK ON VIDEO 2

Video 2: Mast Group Limited, OC-Sensor, How to do your FIT sample: FITPac

Although video 2 was also positively received, all participants preferred video 1. The main reasons for this included less clear instruction compared to video 1, the background music being a distraction, and small text on screen:

> *"Yeah, you can almost find the background music distraction."* P5

Some participants made an interesting observation on the shape of the toilet featured in video 2. The toilet in video 2 had a shallower toilet bowl with a smaller water surface area, different from a typical domestic toilet in the UK:

"…No water in the bottom [on the toilet shown in video 2]… I don't know about you, but if you put load of toilet paper and then [poo] on top of it, it'll just go straight through, right?" P4

Although participants felt that the typical domestic toilet is not suited for the method described in video 2, six participants noted that it would have been a preferred method than catching a poo in a separate container as suggested in video 1:

"Yeah, I mean that [the method in video 2], that would be probably a little bit easier… than going to catch it in a box [as described in video 1]." P1

PARTICIPANT CONFIDENCE IN THE TEST RESULT

Three participants noted that they would be more confident in the test result if they followed the method demonstrated in video 1 than video 2. The main reason for this was the risk of the sample being contaminated from the toilet water. Video 1 has emphasised the importance of the poo sample not making contact with the water:

"…you get your 100% result without [water] contamination [based on video 1], I suppose." P1

"If you followed the instruction on that second video, [poo is] gonna hit water. And you're just going to go. Oh, well. Put it in the test and send it. And then it's a waste of everyone's time." P4

METHODS OF SHARING THE INSTRUCTIONAL VIDEO

All participants discussed the accessibility of the videos and recognised that not everyone will be able to search and access the videos using a digital device such as a smartphone or a tablet:

"To someone, that's in 50s, 60s. Yeah, they don't, they're gonna have [any idea] how to get that [video on a device]…" P5

Five different participants suggested several ways to share the videos to a wider audience. For example, one suggestion was to include a QR code on the FIT kit packaging or the sample container:

"QR code on the back of [sample container], scan then boom, there's a video." P7

The second suggestion was to broadcast the instructional video as a public health announcement (similar to Covid public health announcements) during a popular television programme. The third suggestion was to show the video during a GP appointment (when the FIT kit is given to a patient):

"…get the GP to put it on… How long did that take, a minute?" P6

Alternatively, two participants suggested pictorial instructions using still images and key captions from the videos for those who find accessing or viewing the video challenging:

"The step-by-step guide, yeah, as much detail in that, really, rather than like a one sheet saying do this do that...in a piece of paper pamphlet. It's a bit easier for the older generations." P7

Although the evaluation has captured some views of under-served communities to address the evaluation question 1, the number of responses was not sufficient to be considered a representative

of Dorset residents in deprived communities. The number of focus group was much lower than initially planned (only one successful focus group) and the survey responses were very low due to short survey timescale during the festive period in December 2023. Therefore, the findings shared in this report are not a complete view of the under-served communities within Dorset.

LIMITATIONS OF THE EVALUATION

There were significant limitations with the data available to this evaluation. These limitations should be taken into consideration when understanding the findings highlighted in this report. The limitations to note are:

- Whilst the findings showed no statistically significant difference on the impact of C the Signs on FIT kit completion rate between GP practices with and without C the Signs deployment, it is unclear whether all GP practices with C the Signs had completely integrated the system into their clinical pathway to fully observe its impact. GP practices with 'go-live' dates of C the Signs had a narrow timeframe of one to four months of system integration into their clinical pathway for CRC. Therefore, the implementation process and the adoption of the C the Signs system during this period may have confounded the result at this early stage of system deployment.
- Due to the low numbers of valid quantitative data sets to conduct sub-group analyses such as data distribution by deprivation and cancer diagnosis classification, the available data shared by DiiS was insufficient at the time of reporting to address the evaluation questions 3 and 4.
- Due to difficulty with focus group re-engagement and requirements for approval of social media assets, the process of deciding the educational intervention material and its implementation was significantly delayed. This resulted in a much-reduced period for the intervention and subsequent qualitative data collection than originally planned.
- Due to the short intervention period, it was not possible to attain enough survey responses and focus group participation to draw conclusive findings (through 'data saturation') on the impact of the interventions.
- The qualitative findings are derived from only ten survey responses and one focus group session (of seven participants) and therefore cannot be considered representative of the under-served communities.

SUMMARY AND RECOMMENDATIONS

The key evaluation findings can be summarised as follows:

1. The small number of participants included in this study positively received the two FIT kit instructional videos. Video 1 was marginally more preferred than video 2. The key preferred characteristics of the video included simple and clear instruction, animation of the sample collection method, and voiceover instruction.

2. Suggested methods of sharing the instructional video included the addition of the video QR code on the FIT kit, television public health announcement, the offer to show the video during GP appointments, and a pictorial instruction based on the video content.
3. Based on the quantitative data available at the time of evaluation, there was no significant observable impact of C the Signs on FIT kit completion rates when compared between GP practices with and without C the Signs deployment. It is worth noting that the implementation process, uptake and implications of C the Signs deployment was out of scope of this evaluation. Thus, the process of implementation and level of adoption of C the Signs across the GP practices may have had a confounding impact on the findings presented in this report.

Based on the evaluation findings, the recommendations for the InHIP Dorset project are:

1. Continue with community engagement to gather more public feedback data on the educational interventions.
   a) Continued data collection using the same survey and focus group structure would add value and confidence to further confirm, deny or refine the findings detailed in this report.
   b) Collection of further feedback data will help reflect the public views that are representative of under-served communities in Dorset.
   c) A particular focus on under-served communities may provide evidence of public perceptions unique to a certain subset of the population which may or may not have been presented in this report.
   d) Further data collection may help the InHIP Dorset project team to decide how the selected instructional video is disseminated amongst the communities, and whether different instructional videos would suit the needs of under-served communities.
2. Continue with quantitative data collection to allow further analysis on the impact of C the Signs on FIT kit completion rates, accessibility and diagnosis outcome of CRC over a longer time frame. An extension of the data collection period will allow sufficient time for the GP practices with C the Signs to fully adopt the system into their clinical pathway. This will allow the reassessment of the early findings presented in this evaluation to be either further supported, refined appropriately or refuted once more data is available.

APPENDICES

APPENDIX A. QUANTITATIVE DATA SETS

C the Signs data set
Organisation ID
'Go live' date (a date when a GP practice actioned their first FIT kit to transfer the patient to the C the Signs dashboard for safety-netting and tracking).

DiiS data set
Person
Patient identifier
Deprivation Decile
Age Band
Gender
Ethnicity
Previous cancer flag
Number of long-term conditions

FIT results data
Patient identifier
Faecal Immunochemical Testing ID
Test Request Date
Test Authorised Date

Somerset Cancer Registry pathway (filtered to suspected CRC only)
Patient identifier
Treatment Stage Key
Diagnosis Date Key
Referral Receipt Date Key

GP data (appointments with FIT provision)
Patient identifier
Organisation ID
GP appointment date

Coastal practices
Organisation ID
Coastal flag (True/False)

APPENDIX B. DATA DEFINITIONS AND PRE-PROCESSING

Data Definitions

- coastal_flag = Location of GP practice (LSOA within 1 mile of the coastline, defined by DiiS)
- number_ltc = Number of long-term conditions per patient
- prev_cancer = Whether a patient had previous history of cancer prior to the FIT referral
- gender = Patient's gender identity
- dep_dec = Level of deprivation within patient's neighbourhood.
- *age = Patient's age at the time of the GP appointment when FIT kit was provided
- *ethnicity = Patient's ethnic background

**While refining the PSM model, age and ethnicity variables were removed from the model as they were disproportionately impacting the overall balance.*

Pre–processing steps

In order to join the two data sets from C the Signs and DiiS, a 'loose linkup' methodology was applied by linking the data by patient's NHS number and adding a filter into the data by activity timeline to determine the lowest variance between the two key dates (e.g. GP appointment date and test request date, which should be same or similar date). The data filter was set as a variance of -5 to +14 days for the difference between these key dates to remove potential data quality errors. The step-by-step pre-processing method is described below:

- Read GP appointment data from DiiS data set
- Read FIT result data from DiiS data set
- Merge GP appointment data and FIT results (inner join on patient ID creating many to many relationships)
- Calculate 'variance' = time between GP appointment date and test request date (should be the same/similar)
- Group the data on Appointment and Test ID's (separately) by the smallest variance to create one to one relationship.
- Filter date range by static filter (-5 to +14 days)
- Merge successful merge result data back onto original GP appointment data (left join with GP appointments on the left) To create data set with all GP appointments with FIT provision with result data for those with results.
- Read Somerset Cancer Registry data for pathway markers (diagnosis date, referral date etc.) from DiiS data set
- Merge Somerset Cancer Registry data to main data frame (inner join with main data frame to create many to many relationship)
- Calculate 'variance between referral date and GP appointment date
- Group on GP appointment ID to allow many to one relationship (many appointments can exist under one referral but not many referrals under one appointment
- Join the successful merge pathway data back to the main data frame
- Read person data (demographics) and join onto main data by patient ID
- Use the coastal data to create a flag in the main data (coastal_flag)
- Use the C the Signs data set to create a flag in the main data = is the test/result from a GP that has a 'go live' date and is the test/result after the 'go live' date

APPENDIX C. PROPENSITY SCORE MATCHING PROCESS

The PSM process involved taking the data set of valid patient cases from GP practices with C the Signs and apply a logistic regression model using the following selected variables:

- coastal_flag = Location of GP practice (LSOA within 1 mile of the coastline, defined by DiiS)
- number_ltc = Number of long-term conditions per patient
- prev_cancer = Whether a patient had previous history of cancer prior to the FIT referral
- gender = Patient's gender identity
- dep_dec = Level of deprivation within patient's neighbourhood
- *age = Patient's age at the time of the GP appointment when FIT kit was provided
- *ethnicity = Patient's ethnic background

**While refining the PSM model, age and ethnicity variables were removed from the model as they were disproportionately impacting the overall balance.*

This process returns a single score, called propensity score, for the variables on each patient cases. The same logistic regression model is then applied to the data set of valid patient cases from GP practices without C the Signs to return single score for each patient cases. The propensity scores of the samples from the two data set are then compared to return a matched pair data set that are more balanced cross the selected variables. Any observable difference between these matched groups is likely to be attributable to the deployment of C the Signs. The mean difference of variables between the two patient case groups before and after the PSM is shown in **Figure 2**.

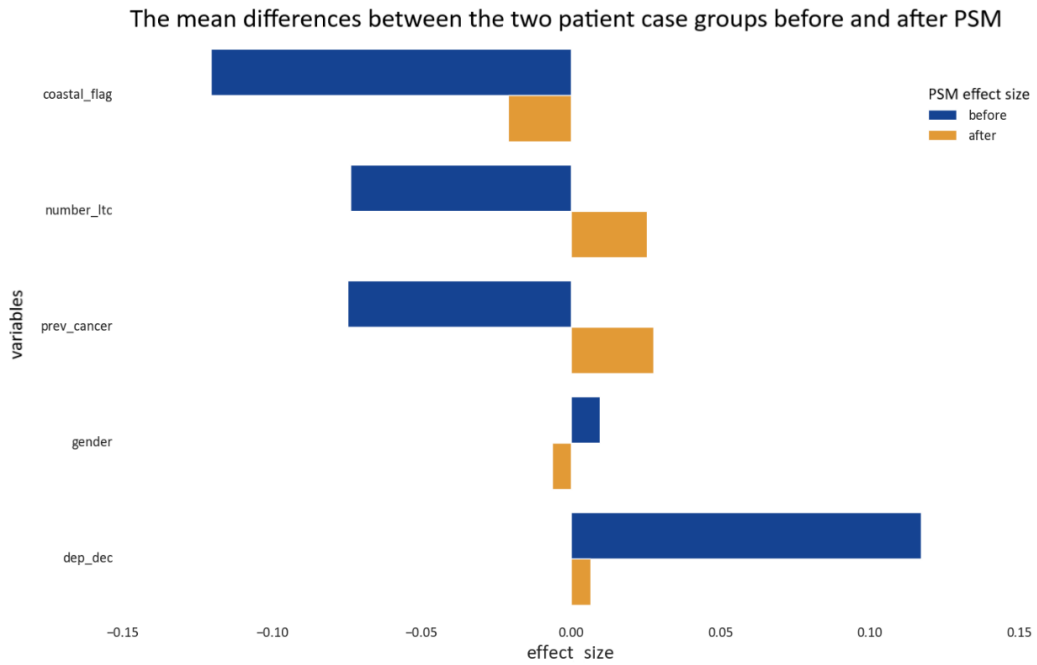


Figure 2 Divergent bar graph showing the mean differences on x-axis (effect size; Cohen D standardised mean differences) between the two patient case group (before and after PSM) for the variables listed on y-axis.

The disparities in the variables were apparent between the two patient case groups**.** After matching the patient cases, a good balance was achieved with all effect size measuring within 0.05.

InHip Dorset
NHS Dorset – FIT Kit Instructional Video Survey

Title:
NHS Dorset – Feedback survey on FIT kit instructional videos

Introduction statement:
Thank you for following the link. NHS Dorset, in partnership with Health Innovation Wessex (HIW), would like to hear your thoughts on the two FIT (faecal immunochemical testing) kit instructional videos.

HIW is collecting your survey response as part of the NHS Dorset bowel cancer programme evaluation. The evaluation findings will be reported to NHS Dorset. This survey will not ask for personal information (such as name or contact details). You will not be identifiable in anyway and we will not be able to trace your response back to you. This process is called anonymisation. HIW's policy is to keep anonymised responses for six years after the final evaluation report has been sent to NHS Dorset. All data is handled in line with the Data Protection Act (DPA) and General Data Protection Regulation (GDPR).

It is up to you whether to take part. If you are **happy to take part, live in Dorset** and **have watched the FIT kit instructional videos posted by NHS Dorset**, please complete this survey by **Friday 31 December 2023**.

If you have any questions, please do not hesitate to contact HIW Evaluation Programme Manager, Amanda Lees: amanda.lees@hiwessex.net

Question	Question Text	Response Options
	Participant consent statement	
1	I agree to take part in this online survey for the evaluation of the bowel cancer programme. I understand that my response is anonymous. ***compulsory**	[multiple choice] ☐ Yes ☐ No **Branching** If **Yes**, proceed to the survey If **No**, the end of survey statement
	About previous experience of FIT kit	
2	Have you been given a FIT (faecal immunochemical test) kit by your GP before? The FIT kit may look like this: 	[multiple choice] ☐ Yes ☐ No ☐ I don't know

FIT Kit Instructional Video No. 1		
In this section, we will show you one of the two instructional videos on how to complete a FIT kit. You will be asked to answer a few questions after each video. Please watch this first video before answering the questions. If you have already seen the video, please feel free to skip straight to the questions. Completing a FIT from your GP (non-screening) - YouTube 		
3	Please select an answer for each statement below: *If you are on a smartphone or a tablet, you may want to rotate your device to landscape mode for better view*	
a	I understood what the video was about	[Likert scale] ☐ Strongly agree ☐ Agree ☐ Neither agree nor disagree ☐ Disagree ☐ Strongly disagree
b	The speed of the video was just right for me	
c	I could clearly read the words on the video	
d	The video length was just right for me	
e	The video felt relevant to me	
f	The video explained why my GP would give me a FIT kit	
g	The video helped me to understand how to use the kit	
h	The video would help me feel more confident in completing the FIT kit	
i	This video helped me understand why it is important to return the completed FIT kit to my GP	
j	This video would make me more likely to return a completed FIT kit to my GP	
4	Do you have any comments to share about this video? *Please feel free to add anything that you liked, did not like or learned from the video*	[free long text]
FIT Kit Instructional Video No. 2		
Thank you for answering the questions for the first video. Here is the second instructional video on how to complete the FIT kit. Please watch the video before answering the questions. If you have already seen the video, please feel free to skip straight to the questions. OC-Sensor: How to do your FIT sample: FITPac - YouTube 		

5	Please select an answer for each statement below: *If you are on a smartphone or a tablet, you may want to rotate your device to landscape mode for better view*	
a	I understood what the video was about	[Likert scale] ☐ Strongly agree ☐ Agree ☐ Neither agree nor disagree ☐ Disagree ☐ Strongly disagree
b	The speed of the video was just right for me	
c	I could clearly read the words on the video	
d	The video length was just right for me	
e	The video felt relevant to me	
f	The video explained why my GP would give me a FIT kit	
g	The video helped me to understand how to use the kit	
h	The video would help me feel more confident in completing the FIT kit	
i	This video helped me understand why it is important to return the completed FIT kit to my GP	
j	This video would make me more likely to return a completed FIT kit to my GP	
6	Do you have any comments to share about this video? *Please feel free to add anything that you liked, did not like or learned from the video*	[free long text]
About you		
7	Please tell us the first 4 or 5 digits of your postcode *For example, DT1 3 or BH12 5*	[free short text]
8	What is your ethnic group? *Choose one the answer that best describes your ethnic group or background*	[multiple choice] ☐ White ☐ Asian or Asian British ☐ Black, Black British, Caribbean or African ☐ Mixed or multiple race ☐ Prefer not to say ☐ Other: [free text]
9	How old are you?	[multiple choice] ☐ Under 18 years old ☐ 18-29 years ☐ 30-39 years ☐ 40-49 years ☐ 50-59 years ☐ 60-69 years ☐ 70+ years ☐ Prefer not to say
10	Which of the following best describes you?	[multiple choice] ☐ Female ☐ Male ☐ Non-binary ☐ Prefer not to say ☐ Other: [free text]

11	Do you consider yourself to have a disability?	[multiple choice] ☐ Yes ☐ No ☐ Prefer not to say

Thank you very much for making the time to complete the survey. Your response was submitted anonymously.

If you have any questions, please do not hesitate to contact HIW Evaluation Programme Manager, Amanda Lees: amanda.lees@hiwessex.net.

For more information on bowel cancer, please visit: Bowel cancer - NHS (www.nhs.uk). https://www.nhs.uk/conditions/bowel-cancer/

NHS Dorset - Bowel cancer awareness and FIT kit project
Focus group topic guide

Participant arrival

As the participants arrive, ask them to take:

- *the information sheet and the consent form*
- *paper copy of the survey*
- *a pen*

Before the session starts, ask the participants to return the signed consent form to us

Part 1: Introduction

Consent Form and Audio Recording

Aim of the focus group

Participant introduction and icebreaker

Part 2: Video No 1

FIT kit experience question

Page 1 of the paper survey: "Have you been given a FIT kit by your GP before?"

Instructional Video No 1. (Completing a FIT from your GP (non-screening) - YouTube**)**

Page 2 of the paper survey: 10 statement questions

Discussion questions:

1. What did you like about the video? (e.g. format / content of the video)
2. What did you not like about the video?
3. What did you learn from the video?
4. Was there anything that you wanted to know that was not on the video?
5. If you were given a FIT kit, do you think the video would have helped you or given you more confidence to complete and return the kit back to your GP?
6. Why / why not?
7. Anything else that you want to share?

Part 3: Video No 2

Instructional Video No 2. (OC-Sensor: How to do your FIT sample: FITPac - YouTube**)**

Page 3 of the paper survey: 10 statement questions

Discussion questions:

1. What did you like about the video? (e.g. format / content of the video)
2. What did you not like about the video?
3. What did you learn from the video?
4. Was there anything that you wanted to know that was not on the video?
5. If you were given a FIT kit, do you think the video would have helped you or given you more confidence to complete and return the kit back to your GP?
6. Why / why not?
7. Anything else that you want to share?

Part 4: Video Comparison

Discussion questions:

1. Which video did you prefer?
   a. For those who preferred video 1, why did you prefer this?
   b. For those who preferred video 2, why?
   c. And for those who didn't have a preference, why is that?
2. How do you think these videos should be shared? (e.g. on social media, GP waiting room screen, public advert, QR code on the Kit itself, etc.)
3. Are there people who might need this information provided in a different way other than on a video?
4. Anything else that you want to share?

Part 5: Demographics

Page 4 of the paper survey: demographic questions

Part 6: Closing

Thank you for your participation

Next stage of the evaluation (analysis and reporting)

Expected timeline for the report to become publicly available

Make sure we have the following from the participants:

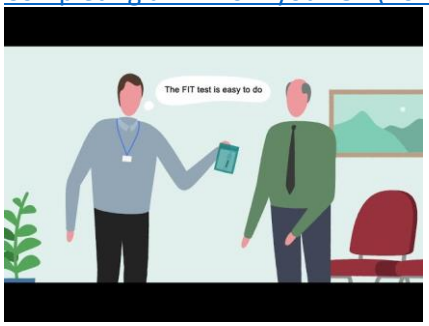
- *Signed consent form*
- *Completed paper survey*

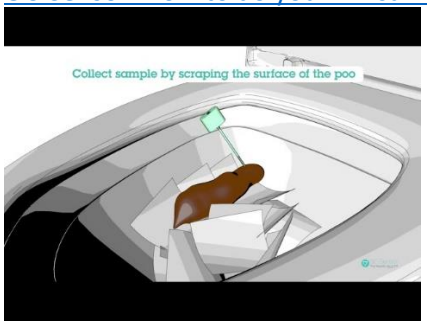
NHS Dorset - Bowel cancer awareness and FIT testing project

Focus Group

Paper Questionnaire

Question 1
Have you been given a FIT (faecal immunochemical test) kit by your GP before? The FIT kit may look like this:    ☐ Yes ☐ No ☐ I don't know

Question 2					
FIT Kit Instructional Video No. 1 Completing a FIT from your GP (non-screening) - YouTube  					
Please select an answer for each statement below:	**Strongly agree**	**Agree**	**Neither agree nor disagree**	**Disagree**	**Strongly disagree**
I understood what the video was about	◯	◯	◯	◯	◯
The speed of the video was just right for me	◯	◯	◯	◯	◯
I could clearly read the words on the video	◯	◯	◯	◯	◯
The video length was just right for me	◯	◯	◯	◯	◯
The video felt relevant to me	◯	◯	◯	◯	◯
The video explained why my GP would give me a FIT kit	◯	◯	◯	◯	◯
The video helped me to understand how to use the kit	◯	◯	◯	◯	◯
The video would help me feel more confident in completing the FIT kit	◯	◯	◯	◯	◯
This video helped me understand why it is important to return the completed FIT kit to my GP	◯	◯	◯	◯	◯
This video would make me more likely to return a completed FIT kit to my GP	◯	◯	◯	◯	◯

Question 3
FIT Kit Instructional Video No. 2 OC-Sensor: How to do your FIT sample: FITPac - YouTube 

Please select an answer for each statement below:	**Strongly agree**	**Agree**	**Neither agree nor disagree**	**Disagree**	**Strongly disagree**
I understood what the video was about	◯	◯	◯	◯	◯
The speed of the video was just right for me	◯	◯	◯	◯	◯
I could clearly read the words on the video	◯	◯	◯	◯	◯
The video length was just right for me	◯	◯	◯	◯	◯
The video felt relevant to me	◯	◯	◯	◯	◯
The video explained why my GP would give me a FIT kit	◯	◯	◯	◯	◯
The video helped me to understand how to use the kit	◯	◯	◯	◯	◯
The video would help me feel more confident in completing the FIT kit	◯	◯	◯	◯	◯
This video helped me understand why it is important to return the completed FIT kit to my GP	◯	◯	◯	◯	◯
This video would make me more likely to return a completed FIT kit to my GP	◯	◯	◯	◯	◯

Question 4	
Please tell us the first 4 or 5 digits of your postcode: *For example, DT1 3 or BH12 5*	
What is your ethnic group? *Choose one the answer that best describes your ethnic group or background*	☐ White ☐ Asian or Asian British ☐ Black, Black British, Caribbean or African ☐ Mixed or multiple race ☐ Prefer not to say ☐ Other: [please describe here]
How old are you?	☐ Under 18 years old ☐ 18-29 years ☐ 30-39 years ☐ 40-49 years ☐ 50-59 years ☐ 60-69 years ☐ 70+ years ☐ Prefer not to say
Which of the following best describes you?	☐ Female ☐ Male ☐ Non-binary ☐ Prefer not to say ☐ Other: [free text]
Do you consider yourself to have a disability?	☐ Yes ☐ No ☐ Prefer not to say