



West of England  
Academic Health  
Science Network



# Summary of the COPD Digital CHAMP Evaluation (Coaching Health App Implementation Partnership)

March 2023

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## Assurance rating

*This report can be used for context and background information	
**This report can help inform decision making, when considered with other information	✓
***This report is the best available evidence to date	

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Click [here](#) for the full quantitative and qualitative reports.

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## Executive Summary

### Project Background

Chronic obstructive pulmonary disease (COPD) prevalence across Bristol, North Somerset and South Gloucestershire (BNSSG) is rising along with England as a whole, with lung disease in the UK costing a staggering £11 billion a year. There is a need to be actively deploying digital innovations to support the growing burden of disease and associated costs.

myCOPD is an app which helps people with COPD to manage their condition effectively and thereby reduce the number of healthcare visits they need.

Historical attempts to deploy digital technology without clinical leadership and detailed implementation plans have led to variable activation rates and roll out across the system. This project aimed to address this by designing and deploying a novel implementation strategy for the myCOPD self-management app using Digital Health Champions (DHCs). It brought together leading experts in digital technology, research, user engagement and clinical teams across the ICS supported by an experienced team at the West of England AHSN. Partners across the BNSSG Integrated Care Board, Healthier Together, collaborated to develop the cross-organisational COPD Digital Champion Service. The COPD Digital Champion Service was designed to support busy NHS staff and patients to get the best out of the myCOPD app, specifically to improve patient recruitment, uptake, and engagement.

### Evaluation Approach

A mixed-methods approach was taken to understand the impact of DHCs on the utilisation of myCOPD app. A quantitative analysis sought to understand the engagement levels of the DHC-enabled myCOPD users and the characteristics and demographics of patients who accepted enrolment on to the app. The evaluation did not focus on the impact of myCOPD itself, only the additional benefit of DHCs.

The qualitative evaluation has supported these findings through a two-phase process. Phase 1 aimed to explore the barriers and facilitators of patient and clinical engagement to inform ongoing implementation and provide recommendations to ensure the DHC service is as acceptable and engaging as possible. Phase 2 aimed to explore the stakeholders experience of the digital champion service and its implementation.

### Results Summary

#### Finding 1: Digital Health Champions increase the utilisation of the myCOPD app and demonstrate a positive Benefit to Cost Ratio

- Use of DHCs led to significantly more patients becoming sustained 'very high' users of the platform, and therefore more likely to yield benefits to the patients and healthcare system.
- Patients felt supported and able to engage with accessible digital technology.
- Despite the support from the DHCs, there will still be a proportion of patients who do not choose to engage with the myCOPD app.
- Positive benefit to cost ratio of 1.2 found across projected five-year period.

#### Finding 2: Digital Health Champions acting as enablers are supportive in overcoming barriers to digital technology and patient demographics do not appear to impact on who will enrol on the app with the support the Digital Health Champions

- Smoking status, age and gender were not found to make a significant difference on whether an individual would enrol to myCOPD, or become a sustained, high-frequency user of the platform. However, there is often a perception of age being a barrier; this perception can and needs to be addressed.
- Key barriers to patient engagement were patient concerns that the app was a replacement (rather than a support) for their existing care, and concerns around how different functions within the app could improve their care.
- A referrer guide is helpful for healthcare professionals to address patient concerns and support patient engagement within often limited resources.

- A personalised approach is required to ensure that the benefits of digital tools are experienced by patients, while providing adequate support for patients who prefer other methods.
- Whilst it is not clear whether DHCs address existing inequalities, there is no evidence that the approach would disadvantage patients based on the demographics captured.

### Finding 3: Key themes reflecting the implementation and sustainability of the service

- Partnership working was key to setting up and implementing the COPD Digital Champion service, however the cross-organisation nature of the service can also create barriers to implementation; such as the governance around data sharing that need to be resolved.
- Clinicians need to be clear about how the app fits within the clinical pathway and have a good understanding of the evidence around digital technology to embrace their role and dedicate themselves to the project and service.
- A service lead, along with project management and clinical lead roles, would be best placed to fully embed the service.
- Decisions regarding referral to DHC should not be made based on assumptions around the digital literacy of patients. Patients can be supported to improve the digital literacy by the DHCs and through linking in with local support resources.

### Conclusion

This mixed-methods evaluation of the COPD Digital CHAMP Service has demonstrated that establishing a cross system DHC service is feasible and that recruiting DHCs to enrol and support patients to use the myCOPD app has a positive impact on patient activation and engagement rate, with a positive Benefit to Cost Ratio.

The evaluation has highlighted that demographics do not appear to play a significant role in whether patients accept enrolment on to myCOPD, particularly when DHCs are able to provide a tailored approach to supporting patients to use the app. Preconceptions around age and digital literacy need addressing to avoid creating an additional barrier.

Collaboration across the ICB and with the AHSN, commercial and evaluation partners was crucial to the success of the project and setting up the service. In order to fully embed the service and the app, further work needs to be completed to increase referral rates, provide team leadership and improve capacity within the team.

### Recommendations

#### *(1) Maximise DHC capacity*

Optimising the capacity of the DHCs would have a positive impact on the realisation of benefits. This may be possible by improved patient identification, lessening the administrative burden (including the data capture required for the project) and increasing referral rates from across the system.

#### *(2) Support further evaluation*

The data collected through this project has great value to measure the impact of the service. Future evaluations can build and develop on the findings of this project and provide greater assurance of the benefits of myCOPD in a real-world setting and provide learnings for successful deployment in other areas.

#### *(3) Legacy planning*

Over time, it would be beneficial to observe the service in a wider context, to seek further opportunities to add value to the system through the use of DHCs. For example, a clearer understanding of pulmonary rehabilitation pathways across the patient group would support an assessment of the proportion of patients who are able to follow a course due to their supported enrolment to myCOPD. To date this comparison has not been possible, meaning that the potential benefits of such courses remain unmodelled.

## National Context

Chronic obstructive pulmonary disease (COPD) prevalence across Bristol, North Somerset and South Gloucestershire (BNSSG) is rising along with England as a whole, with lung disease in the UK costing a staggering £11 billion a year. There is a need to be actively deploying digital innovations to support the growing burden of disease and associated costs, particularly in areas such as Bristol where Public Health England data indicate emergency COPD admissions are significantly worse than the national average<sup>a</sup>.

myCOPD is an app which helps people with COPD to manage their condition effectively and thereby reduce the number of healthcare visits they need. It allows for key aspects of disease management, such as pulmonary rehabilitation (PR), to be provided remotely, based on a person's self-assessment. Research has shown that myCOPD has benefits to both patients and healthcare services, including a hospital admissions and re-admissions, reduction in exacerbations, a reduction in CAT (COPD Assessment Test) scores and improvements in inhaler technique<sup>bcd</sup>.

Historical attempts to deploy digital technology without clinical leadership and detailed implementation plans have led to variable activation rates and roll out across the system. This project aimed to address this learning by designing and deploying a novel implementation strategy for myCOPD using Digital Health Champions (DHCs). It brought together leading experts in digital technology, research, user engagement and clinical teams across the ICS supported by an experienced team at the West of England AHSN.

## Project Background

Partners across the BNSSG Integrated Care Board, Healthier Together, collaborated to develop the cross-organisational COPD Digital Champion Service. The COPD Digital Champion Service was designed to support busy NHS staff and patients to get the best out of the myCOPD app, specifically to improve patient recruitment, uptake, and engagement. The team was made up of DHCs, recruited from the two acute trusts and one community trust.

The DHCs had a variety of backgrounds, working as respiratory physiotherapy assistants, associate practitioners, assistant respiratory physiologists and as a healthcare assistant. Key to this project, these staff were already integrated into the local systems and provided a cross-organisational team with in-reach capabilities. Recognising the challenges of changing behaviour, particularly around digitalisation of care, all DHCs received Motivational Interviewing training to support their discussions. The DHCs were supported by a Clinical Champion (CC), who worked in their own, respective, organisations.

Referrals were received from all parts of the ICB; primary, secondary and community care. Upon receiving the referral, the DHC had an initial contact with the patient, where a referral was from secondary or community care, the DHC within that setting would usually pick up that referral. Referrals from primary care would be split across the team. On the first appointment, the DHC would introduce the patient to the app and what it has to offer and enrol them on the app. The patient would then be followed up within the week, at three weeks and at six weeks; however, this varied depending on patient need and availability. At each appointment, the DHC would discuss different parts of the app through a person-centred approach; this may be guided by what the patient feels they need to focus on, and any goals set by the referring clinician. At the point of the patient being confident to use the app, they would be discharged from the service and would continue with self-management.

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<sup>a</sup> Public Health England 2021, [Fingertips Public Health Data](#)

<sup>b</sup> Bourne S, Devos R, North M, Chauhan A, Green B, Brown T, et al. Online versus face-to-face pulmonary rehabilitation for patients with chronic obstructive pulmonary disease: Randomised controlled trial. *BMJ Open*. 2017;7(7).

<sup>c</sup> North M, Bourne S, Green B, Chauhan AJ, Brown T, Winter J, et al. A randomised controlled feasibility trial of E-health application supported care vs usual care after exacerbation of COPD: the RESCUE trial. *npj Digit Med* [Internet]. 2020;3(1):1–8. Available from: <http://dx.doi.org/10.1038/s41746-020-00347-7>

<sup>d</sup> Crooks MG, Elkes J, Storrar W, Roy K, North M, Blythin A, et al. Evidence generation for the clinical impact of myCOPD in patients with mild, moderate and newly diagnosed COPD: a randomised controlled trial. *ERJ Open Res* [Internet]. 2020 Oct 1;6(4):460–2020. Available from: <http://openres.ersjournals.com/content/6/4/00460-2020.abstract>

## Methods

### Aims and objectives

A mixed-methods approach was taken to understand the impact of the DHCs on the utilisation of myCOPD app. A quantitative analysis sought to understand the engagement levels of the DHC-enabled myCOPD users and the characteristics and demographics of patients who accepted enrolment on to the app. The evaluation did not focus on the impact of myCOPD itself, only the additional benefit of DHCs.

The qualitative evaluation has supported these findings through a two-phase qualitative evaluation. Phase 1 aimed to explore the barriers and facilitators of patient and clinical engagement with the myCOPD app to inform ongoing implementation of the COPD Digital Champion service and provide recommendations to ensure the service is as acceptable and engaging as possible. Phase 2 aimed to explore the stakeholders experience of the digital champion service and its implementation.

### Quantitative analysis methods

Data from multiple sources has been analysed to understand how the use of DHCs has impacted the uptake of the myCOPD app and consequent usage of the platform following activation. Due to being unable to identify an appropriate comparator, many of the comparisons were made against available literature relating to the usage of myCOPD in NHS settings.

- i. The proportion of patients that have engaged with the platform following their initial registration.
- ii. The number of times they have used the platform.
- iii. The elements and modules users engaged with.
- iv. The status of their condition.
- v. The data also included some basic demographic information, such as gender and age.

Further information was requested from the three trusts participating in the project, including:

- vi. Further demographic and lifestyle information relating to patients enrolled to myCOPD by the DHCs.
- vii. Figures relating to acceptance or decline of the offer.

### Health economic analysis

A health economic model was built using a combination of existing literature and data from the project itself. Benefit streams were calculated based on the number of patients seen by DHCs during the pilot programme, and the increase in myCOPD engagement that some DHC-enabled patients exhibit, as detailed below.

A health economic cost benefit analysis model was produced, along with sensitivity analysis of the results. Three benefit streams were identified and modelled:

- i. Reduction in admissions
- ii. Reduction in bed days per admission
- iii. Reduction in inhaler waste

Alongside these benefit streams, one cost stream was modelled:

- iv. DHC staff costs

Due to a lack of suitable data for a comparator group, the rates of symptom scoring frequency found in Cooper *et al.* (2022)<sup>e</sup> were used as a comparative baseline in both benefit stream calculations.

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<sup>e</sup> Cooper, R., Giangreco, A., Duffy, M., Finlayson, E., Hamilton, S., Swanson, M., Colligan, J., Gilliatt, J., Mclvor, M., & Sage, E. K. (2022). Evaluation of myCOPD Digital Self-management Technology in a Remote and Rural Population: Real-world Feasibility Study. *JMIR MHealth and UHealth*, 10(2), e30782. <https://doi.org/10.2196/30782>

## Qualitative study methods

Qualitative Interviews and focus groups were conducted across the project's implementation with a wide range of stakeholders including healthcare professionals, patients, policymakers. In phase 1, participants (n=14) were interviewed on their thoughts, feelings and experiences of the myCOPD app.

In phase 2, participants (n=9) were asked about their experience of the COPD Digital Champion Service, through interviews and focus groups. See table 1 for a breakdown of participants roles in the digital champion service.

Table 1:

Phase 1	Role	Phase 2
2	Digital Health champions	2
2	Clinical champions	3
5	Patients receiving respiratory care	3
3	Clinicians in respiratory care	1
1	Policy maker	0
1	Commercial stakeholder	0
Total=14		Total=9

## Changes to Implementation

A co-participatory design approach was taken based on the person-based approach of intervention development. Findings were presented to the project team to make changes to the implementation of the digital champion service throughout the project. As a result, a 'referrer guide' was created along with a set of recommendations to address engagement and implementation issues.

## Evaluation Governance

The project was registered for QI and service evaluation purposes with the Quality and Safety Improvement team at North Bristol NHS Trust. Ethical approval for this study was received from the University of Bath Psychology Department Ethics Committee on the 15/12/2021. Oversight of how the evaluation was being conducted was delivered through the main programme board supporting the delivery. Valid informed consent was received from all participants at each stage of the programme.

## Findings

### (1) Digital Health Champions increased the utilisation of the myCOPD app and demonstrate a positive Benefit to Cost Ratio

#### Patient activation to myCOPD app

Analysis suggests that the DHCs can actively increase the activity of patients using the myCOPD app. They led to significantly more patients becoming sustained 'very high' users of the platform (38%), in comparison to the report by Cooper *et al*<sup>6</sup> (17%) where patients were unsupported. It is therefore likely that the DHCs are more able to produce benefits to patients and the healthcare system than the myCOPD app alone. Sustained usage and understanding of the platform has been found to be key to benefits being realised and can be a cost-effective way of improving the likelihood that the healthcare system realises potential benefits.

27% of the patients supported by DHCs used four of five modules. In comparison, 16% of patients accessed four or five modules in the report by Cooper *et al*<sup>6</sup>. It is unclear if these figures are directly comparable as the definition of a myCOPD module used here may differ to that found in Cooper *et al*. (2022)<sup>6</sup>, but this does suggest an increase in the level of engagement with myCOPD within the target population.



Figure 1: Active users grouped by symptom scoring frequency

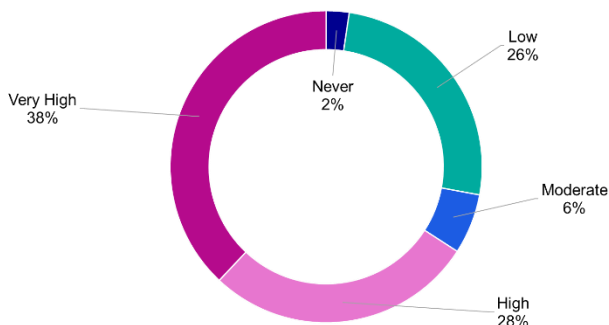
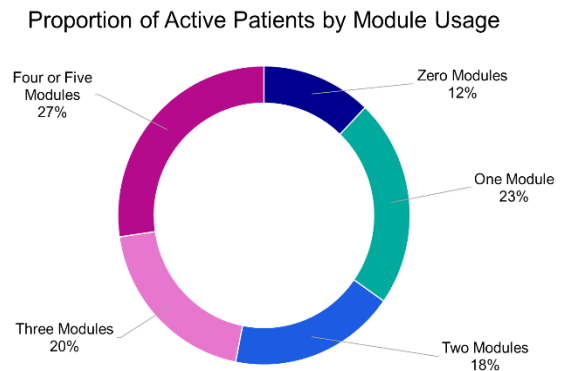


Figure 2: Users grouped by number of myCOPD modules used



Qualitative interviews demonstrated that increased activation was partly due to the tailored, personalised approach that could be offered through a conversation with a DHC. Patients felt that clinicians were able to, in their discussions, find the aspect of the self-management tool (e.g. symptom monitoring, medication review, psychological support) that was appropriate for them, and understand the impact of this aspect on their healthcare. This meant patients felt supported and able to engage with a potentially complex digital technology:

*“I always find that if you speak to somebody it goes in better than just looking at a screen”* (Patient)

## Health economics

The economic cost analysis demonstrates a Benefit to Cost Ratio of 1.2 after five years, meaning that for every £1 spent, the model would return £1.20. Initial losses were seen in the first year due to higher implementation costs, reducing to annual ongoing costs of £89,484 following the first year.

The largest benefit is provided by the NHS non-cash-releasing benefit of the reduction in admissions, which generates £402,000 over five years and accounts for around 62% of the total benefit generated by the programme. Then comes the NHS non-cash-releasing benefit of the reduction in bed days per admission, which totals £237,000 after five years and is responsible for roughly 37% of the total benefit. Finally, a comparatively small benefit of £7,000 after five years is provided by the reduction in inhaler wastage, which accounts for just 1% of the total.

## Summary of key findings:

- Use of DHCs led to significantly more patients becoming sustained ‘very high’ users of the platform, and therefore more likely to yield benefits to the patients and healthcare system.
- Patients felt supported and able to engage with accessible digital technology.
- Despite the support from the DHCs, there will still be a proportion of patients who do not choose to engage with the myCOPD app.
- Positive benefit to cost ratio of 1.2 found.

**(2) Digital Health Champions acting as enablers are supportive in overcoming barriers to digital technology. Patient demographics do not appear to impact on who will enrol on the app with the support the Digital Health Champions**

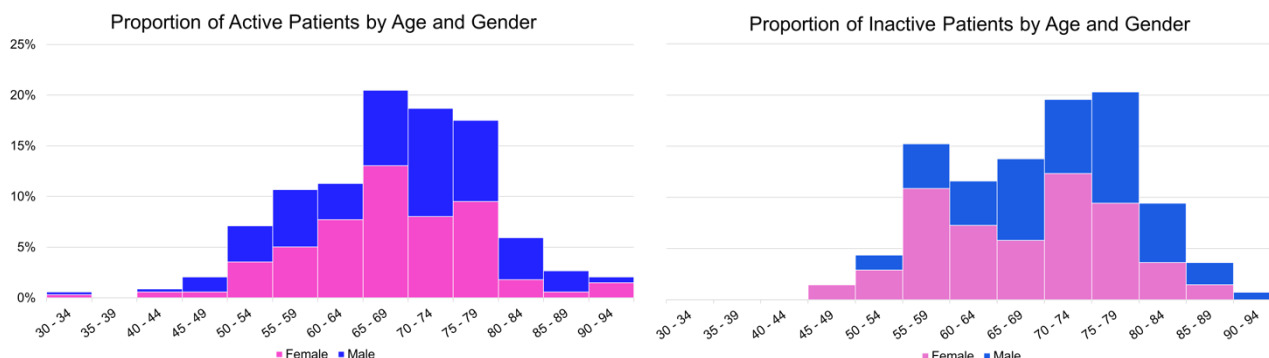
## Overcoming barriers

The qualitative work found several barriers to patient engagement with the myCOPD app. Caution was expressed by patients in terms of privacy, being asked mental health questions, and ambiguity around how to use the app. Similarly, Health Care Professionals (HCPs), CCs and DHCs expressed wanting more information on what they are referring to. Most of the professional participants had concerns about patients’ viewing the app as a replacement for their care and time concerns in terms of embedding myCOPD referral into practice.

## Older patients are no less likely to be 'Very High' users of the myCOPD app

HCPs expected older patients to be less suitable for the app. Based on the data collected, inactive patients had an average age of 69.4, around 1.4 years higher than the average age of active patients, 68.0. Patients aged between 80-89 accounted for around 30% of declining patients, while only representing 6% of accepted patients. While this may appear to be a barrier, for every individual in this age-group that declined the offer, there were 2.75 that accepted.

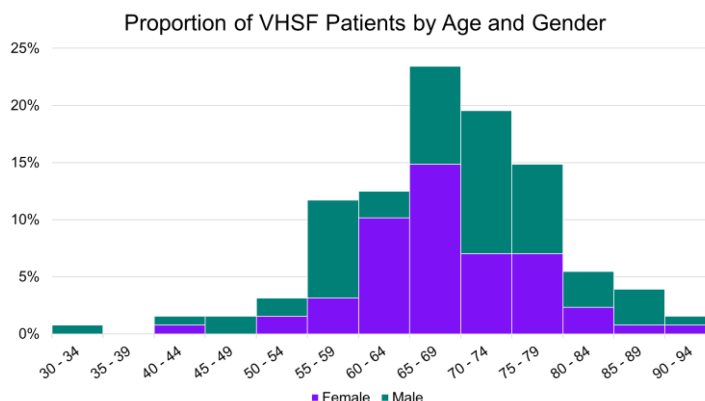
Figure 3: Distribution of active and inactive patients by five-year age bands and gender



There were also no significant differences in age between groups based on frequency of symptom scoring. This suggests that older patients were no less likely to be highly engaged myCOPD users when given access to DHCs. In general, the demographics of the 'Very High' users were similar to those of the whole sample, as shown in **Error! Reference source not found.3**.

Additionally, there was no correlation between uptake of the app and whether the patient was a current smoker, ex-smoker or non-smoker. 77% of all declining patients were listed as ex-smokers, compared to 75% of the population for accepting patients

Figure 4: Distribution of patients with a very high scoring frequency by five-year age bands and gender



## A tailored approach to support patients to use myCOPD is needed

The analysis showed that, despite an overall rise in the number of patients taking up myCOPD, not all patients who registered with the programme ended up activating myCOPD (29% failed to activate the app). Qualitative interviews highlighted that this may be due to the (necessary) broad set of tools offered within a self-management tool such as myCOPD. It is important to support patients to understand how an app can benefit them (in a meaningful, personalised way; for example, by suggesting a 'myCOPD tile' that they would find useful) in order to facilitate long term engagement.

*"I think there is so much information on there which it could get overwhelming. So it's good to be able to break it down to the different tiles and just focus on a little bit at a time"* (CC)

Given the variability of patient needs, the flexible approach of DHCs is perceived to be useful in providing a tailored appointment and setting goals for using myCOPD with each patient. This includes DHCs being able to use their own judgement in how and when to refer and guide their patients with the app.

*"I think we are quite experienced with knowing the patients who will benefit from it although we offer it to everyone"* (CC)

## Healthcare Professionals and Digital Health Champions need guidance to fully support patients

DHCs expressed desire for some guidance on how many follow-up phone calls to make and some standardised messaging to send to patients between phone calls, i.e., a template email for patients who have not answered the phone after a certain number of calls.

*“It would be beneficial that we'd all be saying the same sort of thing as well so everyone's having the same service delivery” (DHC)*

HCPs expressed the importance of having the app at hand to show patients, preferably in person, with a personalised approach given the huge variability in the different clinical needs of COPD patients. A 'referrer guide' was co-designed to address these points for HCPs to improve patient and health professional implementation and engagement going forward.

### Summary of key findings:

- Smoking status, age and gender were not found to make a significant difference on whether an individual would enrol to myCOPD, or become a sustained, high-frequency user of the platform. However, there is often a perception of age being a barrier; this perception can and needs to be addressed.
- Key barriers to patient engagement were patient concerns that the app was a replacement (rather than a support) for their existing care, and concerns around how different functions within the app could improve their care.
- A referrer guide is helpful for healthcare professionals to address patient concerns and support patient engagement within often limited resources.
- A personalised approach is required to ensure that the benefits of digital tools are experienced by patients, while providing adequate support for patients who prefer other methods.
- Whilst it is not clear whether DHCs address existing inequalities, there no evidence that the approach would disadvantage patients based on the demographics captured.

### (3) Key themes reflecting the implementation and sustainability of the service

The findings reported here also reflect learning from the project team, as well as drawing from insight evidenced in the qualitative and quantitative reports.

#### Partnerships

The key strength to this project was the collaboration between multiple-organisations and sectors, with the commercial team sitting alongside NHS colleagues, ICB, project management from the AHSN and evaluation partners. A project closure reflective session highlighted project management and clear clinical leadership as integral factors in driving the project forward.

The cross-organisational nature of the COPD Digital Champion Service provided an opportunity to breakdown service and geographical barriers. However, some aspects of information governance acted as limitation, for example a 'joint caseload' across the different health systems was planned to facilitate the seamless transfer of care between providers. At the time of writing this report, a resolution to the barriers preventing a joint caseload has not been found.

Clinical teams were key to designing the service and referral pathways, and for understanding the local nuances, drivers and barriers to implementation. The CCs (Band 7 nurses) in each service and in primary care were instrumental in working with colleagues on the ground to embed the step-change to their pathways. As myCOPD is a self-management tool, the involvement of Primary Care colleagues was also integral to the project. A third of practices across BNSSG signed up to project and set up an SMS campaign to invite patients to self-refer to the myCOPD app via the COPD Digital Champion team, alongside directly referring patients, supported by guidance from my mHealth for how this has successfully worked in the past.

The qualitative team were able to provide guidance on how to improve clinician referral rates and patient uptake, through the 'Referrer Guide'. Delays in procuring the analytics services and in securing Information Governance sign off led to some aspects of the analysis not being completed within the

time constraints of the project. Earlier engagement with the Information Governance teams is needed in future projects.

Throughout the project, my mHealth (founders and owners of myCOPD) were actively involved in the set up and delivery phases. Their insight and knowledge of other trusts who are successfully utilising the myCOPD app was shared and their Digital Health Advisors provided guidance to the local DHCs.

Throughout the project, a small group of Patient and Public Involvement and Engagement representatives provided feedback on the app and the service, which positively impacted on the design and delivery.

### Optimising the service for future success

In project team and stakeholder discussions, it was highlighted how it was crucial to understand the ongoing role of DHCs in patient care – including and beyond the timeframe of the project. Ensuring that the app would continue to be available to patients once enrolled would allow DHCs to embrace their role and dedicate themselves to it within their daily roles, even if long-term funding was not provided.

In addition, HCPs and DHCs considered the limitations of their time as an important factor. Throughout the project, the key message that the app and the service were designed to reduce (rather than add to) their case load needed to be regularly re-emphasised on a peer-to-peer level. There were also concerns highlighted in the interviews about how the app would continue to be resourced to support patients in the long term.

*“I think if there's any external resource that can be put in place to actually go in and get patients set-up on myCOPD would be useful. I think that was a huge barrier for digital health champion is actually released from clinical time because the demand is so high” (Clinician)*

Clinicians also noted that, while they were not yet aware of evidence of clinical effectiveness (for example, demonstrable reductions in hospital admissions), they were happy to recommend it as a supportive information resource until the necessary clinical evidence was provided.

*“I haven't seen how it's impacted like hospital admissions and things, but I can see how someone can get enjoyment out of it and learning out of it” (CC)*

Effective collaboration between academic and evaluative teams is required to provide the necessary clinical evidence that the required time investment in the process would be useful, for themselves and for patients.

It became clear during the project that the role of a service lead would have provided additional oversight to the DHCs. Unfortunately, this was not possible within the project budget, but it would be beneficial to consider this in future models similar to that of the COPD Digital Champion Service.

Sensitivity analysis performed as part of the health economic analysis identified DHC capacity as the most significant factor affecting outcomes. It is anticipated that DHC capacity would naturally rise following the implementation phase of the project, once data reporting requirements are reduced, and staff become more familiar with the referral and enrolment procedures. The nature of the pilot meant that referral and spread into primary care settings was controlled in case funding was not maintained. Enabling easy communication in this way, meant that practices could not refer unless they had signed up, which impacted on the referral rate from primary care. Therefore, widening the referral to all practices would have a positive impact on referral rates.

### Digital exclusion

The COPD Digital CHAMP project team was keen to align to and link with local services for providing patients with a device where they could not afford it. However, systemic infrastructure in healthcare settings is not in place to provide a patient with a device for long-term use. Given that the app is for long-term self-management, it was deemed inappropriate to issue a device for a short-term loan.

Therefore, additional insight data was collected to inform future practice around the impacts of digital technology on health inequalities. Where patients declined to be enrolled onto myCOPD, data was collected by DHCs on the reasons behind this. While the data is incomplete, only 13 of 69 declining patients cited technology as a direct factor in their decision, with a few patients stating they were not interested in technology and the majority stating that they did not have a device capable of using

myCOPD. Nonetheless, while this is a low proportion of patients (n=19%), providing support for these patients to remove the risk of digital exclusion and health inequalities needs to be considered in future work.

The qualitative interviews highlighted that there is potential to use external sources of support such as library computer courses, peers and local groups to facilitate patients' learning of digital tools. In response patients were provided with a list of local resources that they could access to improve their digital literacy.

*“If there are any local respiratory and patient led groups available or support groups, and that would also be another way of trying to raise awareness” (Clinician)*

In qualitative interviews, HCPs reported that they felt that they needed to identify people who were likely to have effective engagement with the app, and this was sometimes done using intuition and knowledge about patients' health and digital literacy.

*“It's more about our patient cohort, they are older, but they're also further down the line in their disease process. So actually either the app's not appropriate or like I said, they're not capable of using it” (DHC)*

However, as the DHCs provide tailored personalised access, which takes in to account digital literacy barriers, patients should not be ruled out based on HCP assumptions. The referrer guide developed through the qualitative study should help in stopping assumptions forming a basis for referral, supporting access for the people who may benefit the most.

### Summary of key findings:

- Partnership working was key to setting up and implementing the COPD Digital Champion service, however the cross-organisation nature of the service can also create barriers to implementation; such as the governance around data sharing that need to be resolved.
- Clinicians need to be clear about how the app fits within the clinical pathway and have a good understanding of the evidence around digital technology to embrace their role and dedicate themselves to the project and service.
- A service lead, along with project management and clinical lead roles, would be best placed to fully embed the service.
- Decisions regarding referral to DHC should not be made based on assumptions around the digital literacy of patients. Patients can be supported to improve the digital literacy by the DHCs and through linking in with local support resources.

## Conclusion

This mixed-methods evaluation of the COPD Digital CHAMP Service has demonstrated that recruiting DHCs to enrol and support patients to use the myCOPD app has a positive impact on patient activation and engagement rate, with a positive Benefit to Cost Ratio.

The evaluation has highlighted that demographics do not play a significant role in whether patients accept enrolment on to myCOPD, particularly when DHCs are able to provide a tailored approach to supporting patients to use the app and assumptions around digital literacy need addressing. Behaviour change is necessary to avoid individuals making assumptions about patients being appropriate for the app or not as elderly patients that have engaged with the app are no less likely to become sustained users of the platform.

Collaboration across the ICB and with the AHSN, commercial and evaluation partners was crucial to the success of the project and setting up the service. In order to fully embed the service and the app, further work needs to be completed to increase referral rates, provide team leadership and improve capacity within the team.

Future evaluation should focus on the benefits of the myCOPD app in the real world setting with further analysis on the app and the DHC model on healthcare utilisation and clinical outcomes. This will support decision making regarding ongoing funding of the app and of the COPD Digital Champion Service, as well as providing clinicians with the necessary confidence to refer their patients.

## Recommendations

### (1) Maximise DHC capacity

Optimising the capacity of the DHCs would have a positive impact on the realisation of benefits. This may be possible by improved patient identification, lessening the administrative burden (including the data capture required for the project) and increasing referral rates from across the system.

### (2) Support further evaluation

The data collected through this project has great value to measure the impact of the service. Future evaluations can build and develop on the findings of this project and provide greater assurance of the benefits of myCOPD in a real-world setting and provide learnings for successful deployment in other areas.

### (3) Legacy planning

Over time, it would be beneficial to observe the service in a wider context, to seek further opportunities to add value to the system through the use of DHCs. For example, a clearer understanding of pulmonary rehabilitation pathways across the patient group would support an assessment of the proportion of patients who are able to follow a course due to their supported enrolment to myCOPD. To date this comparison has not been possible, meaning that the potential benefits of such courses remain unmodelled.



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