

**General Practice Academic Research  
Training Scheme (GPARTS) Fellowship**  
**Executive Summary**

**Novel models of asthma care in UK  
General Practice:  
Lessons from the COVID-19 pandemic**

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## **Evidence Brief**

### **Why did we start?**

From the start of the COVID-19 pandemic General Practice in the UK has been under considerable pressure to maintain services despite pandemic restrictions including social distancing measures, adjusting to remote consulting and coping with rising workload. Ongoing provision of asthma care has been particularly challenging due to the overlap between COVID-19 and asthma symptoms, uncertainty about the additional risk posed by the virus risk to this patient group, and the challenges of delivering vital elements of an asthma consultation within COVID-19 restrictions.

### **What did we do, and what answer did we get?**

#### ***Study 1***

Searches of routinely collected General Practice records to identify patients with severe asthma for 'shielding' during the pandemic highlighted challenges of accurately identifying this high-risk cohort from routinely collected data. However, it also placed a spotlight on exciting potential opportunities including identifying people who could benefit from specialist assessment. Study 1 aimed to determine how previous studies have used primary care records to identify and investigate severe asthma and whether linkage to other data sources is required to fully investigate this 'high-risk' disease variant.

A scoping review was conducted based on the Arksey and O'Malley framework. Twelve studies met all criteria for inclusion. We identified variation in how studies defined the background asthma cohort, asthma severity, control and clinical outcomes. Certain asthma outcomes including hospitalisations could only be investigated through linkage to secondary care records. This study highlighted the unique capacity of primary care data to identify people with severe asthma, particularly in the UK. However, a number of challenges need to be overcome if its full potential is to be realised.

#### ***Study 2***

The COVID-19 pandemic led to the rapid and reactive deployment of remote consulting in UK General Practice. Study 2 aimed to explore the implementation of remote consulting for asthma in UK General Practice in response to the pandemic.

I conducted a mixed-methods evaluation of the implementation of remote asthma consulting in General Practice in Northern Ireland, informed by extended normalisation process theory. Ten themes were identified to describe and explain the contribution of General Practice staff to implementation of remote asthma consulting. Staff identified novel alternatives to deliver the components of an asthma consultation remotely. Practice champions were important to drive implementation forward, and engage other members of staff. Patient, staff, and healthcare system-contextual factors influencing implementation were identified including access to, understanding of, and willingness to use the technology required for remote consulting. This study demonstrated that remote consulting could be integrated into asthma care in General Practice. However, work is required to develop an approach which ensures patient access is not negatively affected, and ensure practices have the required capability and capacity for implementation.

### **What should be done now?**

These two complementary studies demonstrate that lessons can be learned from the COVID-19 pandemic to inform asthma care delivery in General Practice in the future. However, work is required to ensure patients and Practices are adequately supported to translate this learning into practice.

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## **Background**

From the start of the COVID-19 pandemic General Practice has been under considerable pressure to maintain services despite pandemic restrictions including social distancing measures, adjusting to remote consulting and coping with rising workload (1). Ongoing provision of asthma care has been particularly challenging due to the overlap between COVID-19 and asthma symptoms, uncertainty about the additional risk posed by the virus risk to this patient group, and the challenges of delivering vital elements of an asthma consultation within COVID-19 restrictions.

### **COVID-19 risk and asthma**

A decision was taken in March 2020 to advise people deemed clinically extremely vulnerable (CEV) to severe impact from the COVID-19 to take additional precautions by 'shielding' themselves. General Practice teams were instructed to conduct searches of routinely collected General Practice records to identify these patients and advise them to 'shield'. People with 'severe asthma' were included on the 'shielding' list.

Severe asthma is a subtype of asthma that does not respond to the maximum drug therapy available in General Practice (2), and is associated with poor outcomes and has a significant impact on patients' lives (3). Patients with severe asthma have significantly better outcomes if they are identified and referred for specialist assessment (4). Specialist therapies are now available for a subgroup of people with severe asthma, and have been shown to significantly improve outcomes. Identifying people with severe asthma in General Practice is challenging, and there is currently wide variation in referral practices from General Practice to specialist severe asthma clinics across the UK (5).

Searches of routinely collected primary care records to identify patients with severe asthma for shielding during the COVID-19 pandemic have highlighted the challenges of accurately identifying this high-risk cohort from routinely collected data. However, they have also placed a spotlight on exciting potential opportunities including identifying people who could benefit from specialist assessment. By reviewing existing literature, we can examine how primary care data has previously been used to identify and investigate severe asthma. Given that people with asthma have healthcare records held in various other databases throughout the healthcare system, we can also examine the benefits and challenges of linking primary care data to other healthcare and administrative data to support the identification and investigation of this high-risk group.

### **COVID-19 restrictions and delivery of asthma care**

In March 2020 General Practices in the UK were advised to adopt a total triage model and to consult remotely wherever possible to protect patients and staff from COVID-19 (6, 7). This led to the rapid and reactive deployment of remote consulting. This included delivery of care for people with asthma. Continued delivery of asthma care in General Practice has presented particular challenges in the context of the pandemic, given the potential additional risk to patients with asthma posed by the virus, and the challenges of continuing to deliver vital elements of asthma consultations within COVID-19 restrictions.

For asthma, the current evidence base for remote consulting is limited (8). This presented an opportunity to evaluate the implementation of remote asthma consulting in response to the COVID-19 pandemic, and learn from the experiences of the frontline professionals involved in implementation. This could inform if and how remote asthma consulting is integrated into routine clinical care in General Practice long-term.

## **Research Questions**

### **Study 1**

What is known about the use of routinely collected primary care records to identify and investigate severe asthma?

Is linkage to other data sources required to accurately identify patients with severe asthma?

### **Study 2**

What factors impacted the implementation of remote asthma consulting in General Practice during the COVID-19 pandemic, from the perspective of frontline healthcare professionals?

## **Personal and Public Involvement (PPI)**

NIHR defines public involvement as research being carried out 'with' or 'by' members of the public rather than 'to', 'about' or 'for' them (9-11). There are a variety of approaches to public involvement in research. Consultation is the process of asking members of the public for their views and using these views to inform decision making. To inform the development of studies to try to answer my proposed research questions, I conducted a quality improvement study within our own General Practice. This not only aimed to enhance the quality of care we provide for patients with asthma, but was also an opportunity to gain the views of patients on risk stratification and remote asthma consulting, as well as personal insights into their practicalities within a General Practice setting. In this study, patients with lived experience of severe asthma were involved through consultation in the build up to the research (providing indirect guidance), however did not have a direct role in the design of the studies.

I conducted searches of routinely collected practice data to identify patients receiving recurrent courses of oral corticosteroids for asthma attacks. I then developed a template to guide remote asthma consulting based on guidance to support the assessment of people with suspected severe asthma in a General Practice setting and guidance on remote respiratory consultations to adapt the guidance for remote care (12-15).

As well as meeting an important clinical need within pandemic restrictions, this was an opportunity to gain an insight into the practicalities of remote asthma consulting and the opinions of patients on being identified as high risk and on remote consulting for their asthma. These patient insights reinforced the importance of the research questions, and informed the design of the two studies to answer them.

## **Study 1: Using routinely collected primary care records to identify and investigate severe asthma: a scoping review**

For the purposes of this executive summary, the included scoping review will be referred to as Study 1 (16).

### **Background**

There is evidence that people with severe asthma in General Practice have significantly better outcomes if they are identified and referred for specialist assessment. Searchers of routinely collected General Practice records for shielding during the COVID-19 pandemic highlighted the potential of this data to identify people with severe asthma. Shielding during the coronavirus pandemic has highlighted the potential of routinely collected primary care records to identify patients with 'high-risk' conditions, including severe asthma.

### **Objectives**

This scoping review aimed to determine how primary care records had previously been used to identify and investigate severe asthma, and whether linkage to other data sources was required to accurately identify this 'high-risk' disease variant.

### **Methods**

A scoping review was conducted based on the Arksey and O'Malley framework (17). Scoping review methodology was chosen as our aim was to identify how research has been conducted and the knowledge gaps in this area.

### **Results**

Twelve studies met all criteria for inclusion. There was variation between included studies on how they defined the background asthma population and varying severities of asthma. The majority of studies utilised asthma 'Read codes' within primary care records to identify the background asthma population, with the remaining studies using either asthma prescriptions records or a specialist diagnosis. All studies classified levels of asthma severity using asthma prescription records, the majority using either British Thoracic Society (BTS) or Global Initiative of Asthma (GINA) treatment steps. However, studies varied in their approach to differentiating people of maximal therapy, difficult-to-treat asthma and 'severe asthma'.

### **Conclusion**

The ability of primary care records to represent the entire known asthma population is unique. To realise the potential of routinely collected General Practice data for identification of people with severe asthma, consensus is required on a number of issues, including which cohort of people with suspected severe asthma can and should be identified using routinely collected data to support referral to specialist care.

## **Study 2: Implementation of remote asthma consulting in General Practice in response to the COVID-19 pandemic: an evaluation using extended Normalisation Process Theory**

For the purposes of this executive summary, the included mixed methods study will be referred to as Study 2 (18).

### **Background**

The COVID-19 pandemic led to the rapid and reactive deployment of remote consulting in UK General Practice. For asthma the evidence base for remote consulting is limited. This presented an opportunity to evaluate the implementation of Remote Asthma Consulting (RAC) in response to the COVID-19 pandemic, and learn from the experiences of the frontline professionals to inform future care.

### **Objective**

This study aimed to identify factors which impacted the implementation of remote asthma consulting in General Practice during the COVID-19 pandemic, from the perspective of frontline healthcare professionals.

### **Methods**

Mixed-methods evaluation, informed by extended Normalisation Process Theory (eNPT). Data were collected from a range of healthcare professionals from General Practice in Northern Ireland who provide asthma care using an online questionnaire, interviews, and multidisciplinary focus groups.

### **Results:**

Ten themes were identified to describe and explain the contribution of General Practice staff to the implementation of RAC. Team members had to identify novel alternatives to in-person review. Having a practice champion, to drive implementation forward and engage other practice staff, was important. General Practice staff involved in this study highlighted significant patient, professional and practice contextual factors impacting their motivation and ability to engage in remote asthma consulting. Practices varied in terms of workload, staffing, and access to required technology and training. Participating staff felt patients varied in terms of their technology access and/or experience, and characteristics such as literacy and sensory deficits (vision, hearing and cognition). Staff felt the rapid and reactive implementation of RAC in response to pandemic restrictions disproportionately impacted certain patients and practices, and without appropriate support there was a risk of exacerbating existing healthcare inequalities, including related to access to care.

### **Conclusion:**

The experiences of frontline healthcare professionals in this study indicate that remote asthma consulting has potential benefits in terms of access and effectiveness when implementation integrates seamlessly with face-to-face care for those who want or need it. Work is required at practice and healthcare system levels to realise this potential, and ensure implementation does not exacerbate existing healthcare inequalities.

## **Implications for practice, policy and research**

### **Study 1**

*Practice:* People with severe asthma have significantly better outcomes when identified in General Practice and referred for specialist assessment (4). Currently, access to specialist care for people with severe asthma is dependent on whether the person's General Practice team refers them for specialist assessment, and there is currently significant variation between practices across the UK (5, 19). Using routinely collected data to identify people with potential severe asthma in General Practice could reduce inequalities in access to specialist assessment and therapies.

*Policy:* To realise this potential, international consensus is required on how to define the background asthma population, and varying levels of asthma severity and control, using routinely collected records. We also need consensus on the extent to which we should differentiate people with difficult-to-treat asthma from severe asthma using routinely collected data prior to specialist review. The study highlighted potential benefits of data linkage for accurate definitions and identification of severe asthma. However, this will face challenges nationally and internationally due to variability in the availability of the routinely collected data and data linkage infrastructure required.

*Research:* There are also important potential benefits of identifying people with severe asthma for research, including gaining a better understanding of this high-risk disease variant, gaining accurate estimates of prevalence and disease burden, as well as the identification of potential candidates within practices for invitation to clinical trials. However, for research studies international standardisation on the definition of severe asthma is vital.

### **Study 2**

*Practice:* The experiences of frontline healthcare professionals in this study indicate that remote asthma consulting has potential benefits in terms of access and effectiveness when implementation integrates seamlessly with face-to-face care for those who want or need it. 'Work' can be done to support implementation and integration of remote asthma consulting into everyday clinical practice. A practice champion needs to be identified to drive implementation, lead on engaging all members of the multidisciplinary primary care team, and communicate the value, purpose, and possibilities associated with remote asthma consulting.

*Policy:* Significant work is also required at a system and policy level. Consensus is required on if, when and how to utilise remote consulting for asthma care. The long-term approach to asthma care needs to be personalised to the individual needs and preferences of patients, not least to ensure it doesn't exacerbate existing inequalities in relation to patient access and outcomes. Staff need standardised access to equipment and training, and the technology should be simple to use and should seamlessly integrate into practice workflow.

*Research:* The evidence for remote asthma consulting is limited, including on the optimal approach for implementation. To inform the development of guidance and a standard approach across the UK and beyond, research is needed to develop the optimal approach, and evaluate its clinical and cost effectiveness.

### **Bringing together the findings**

Asthma has moved into the arena of *precision medicine*. Precision medicine is defined as "treatments targeted to the needs of individual patients on the basis of genetic, biomarker, phenotypic, or psychosocial characteristics that distinguish a given patient from other patients with similar clinical presentations" (20).

Precision medicine is already making an impact in severe asthma. People with severe asthma can be stratified and their treatment personalised based on the presence of specific biomarkers. Biologic therapies are now available for a subgroup of patients with severe



asthma, and these therapies have been shown to reduce asthma attacks and improve symptoms for this patient subgroup (13, 14). However, to access these therapies, patients currently need to be identified by their General Practice team and referred to specialist centres, and there is wide variation in referral patterns across the UK leading to inequalities in patient access. Searches of routinely collected data during the pandemic and the findings of Study 1 demonstrate that precision medicine could move downstream from specialist care to primary care, as it is possible to harness the power of routinely collected General Practice data to stratify the General Practice asthma cohort and identify people who would benefit from specialist assessment. This could be taken a step further, with identification of the subgroup of patients who may benefit from specialist therapies. Investigations required to identify this subgroup including fractional exhaled nitric oxide (FeNO) and blood eosinophils are already available in the General Practice setting (21). However, their use prior to specialist referral would need to be balanced against the additional workload, its cost-effectiveness and whether it would actually change clinical management.

The evolution of precision medicine for people with severe asthma raises the question of whether a personalised (stratified) approach could also be applied to the delivery of care for the rest of the asthma population. The findings of Study 2 indicate that a personalised approach could be applied to the asthma population, where a person's care is tailored to their individual needs and preferences. Decisions on care delivery, including when to use face-to-face or remote consulting, could be based on information collected before and during an initial triage consultation. However, much work is required to determine how to actually implement this in practice, as well as providing patients and practices with the necessary resources, training and support for remote consulting.

Bringing all the findings together, a potential future model for chronic asthma care in General Practice emerges, however a number of questions remain unanswered (Figure 1). Routinely collected GP data could be used to annually identify the background asthma population in each practice, and stratify people to either specialist or General Practice care. For stratification to specialist care, consensus is required on which subgroup should be identified (i.e. people on high treatment step therapy or with difficult to treat asthma). For people with asthma stratified to General Practice care, a decision will be needed on whether everyone should be reviewed annually, or whether we should prioritise a subgroup considered high risk. Delivery of chronic asthma care in General Practice could be personalised using information gathered prior to and during an initial remote review, with a decision on whether subsequent face-to-face review is required. For people whose care is delivered remotely, research is required to generate evidence on the optimal approach, including how to adapt the required components.

## **Conclusion**

The COVID-19 pandemic has had a significant impact on people with asthma, particularly people with severe asthma. Building on searches of routinely collected General Practice records for shielding, Study 1 demonstrated that it is possible to identify people with difficult-to-treat asthma, who would benefit from referral to specialist care. However, much work is required to develop and evaluate a standardised approach. Study 2 demonstrated that, with a personalised approach based on the individual needs and preferences of each patient, remote consulting could be integrated into routine asthma care. However, work is required to develop an approach which ensures that access for some patients is not eroded, and to ensure that practices have the required capability and capacity for implementation.

The suggested stratified and personalised model of asthma care in General Practice integrates the findings from both studies and other research that demonstrate that a new approach could be developed. Time will tell whether we take this opportunity to harness the lessons from the pandemic and rethink how we deliver asthma care.

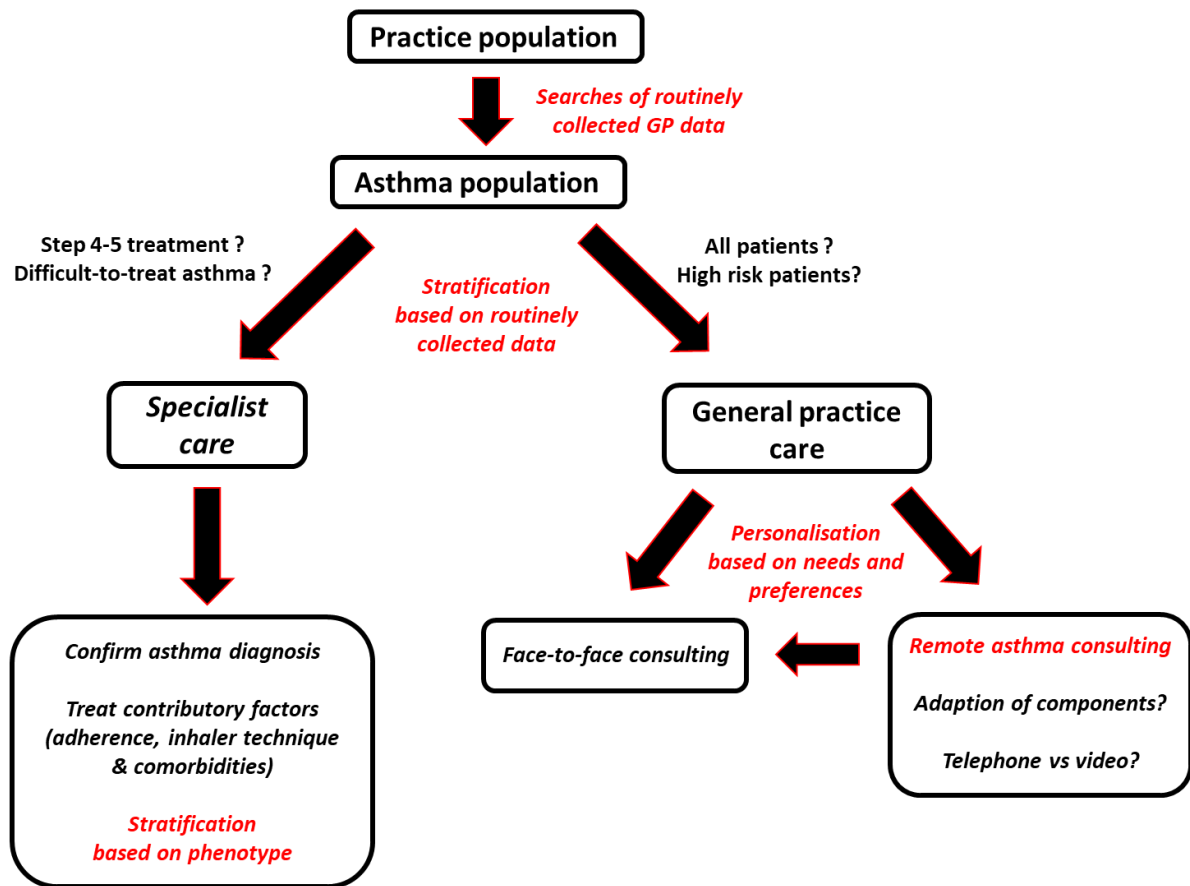


Figure 1 – Potential future model for chronic asthma care in General Practice

## Research outputs and dissemination

### Study 1

Study 1 was published in NPJ Primary Care Respiratory Medicine in 2021 (16). The initial findings of this study were presented nationally on two occasions at Health Data Research UK (HDR-UK) meetings in November and December 2019.

### Study 2

Study 2 was published in BJPG Open in 2022 (18). The findings of this study were presented nationally at the GP Academic Clinical Fellow (ACF) Annual Conference in March 2021.

### MPhil Thesis

The findings of both studies were submitted as a thesis for the degree of Master of Philosophy (MPhil) at Queen's University Belfast.

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