

# Outcomes report SIGN 153 and SIGN 158:

## SIGN/BTS British guideline on the management of asthma

Beatrice Cant, Programme Manager SIGN

Marit Boot, Programme Manager SIGN

January 2022

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**Published January 2022**

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## Foreword

Asthma is a challenging condition to manage. Around 1,200 people die in the UK with asthma every year and clinicians and patients value robust advice and guidance on what works to diagnose and treat. Asthma management relies on close working across boundaries from primary care into secondary care and back, between disciplines and with patients and their families. The development of the SIGN/BTS asthma guideline by SIGN and the British Thoracic Society (BTS) represents the best of working together. A charity working with an NHS body, building on the skills and expertise in each to deliver a product well recognised and valued. The BTS and SIGN have collaborated for the last twenty years and published the first UK-wide guideline on the management of asthma in 2003. A new collaboration was launched in 2021, bringing SIGN and BTS together with NICE to produce the next Asthma guideline for the UK.

It is important to look back as we move forward to capture what worked well to inform the future and we are pleased to present this outcomes report focused on BTS/SIGN 153 published in 2016 and BTS/SIGN 158 published in 2019 to highlight the impact of this successful collaboration.

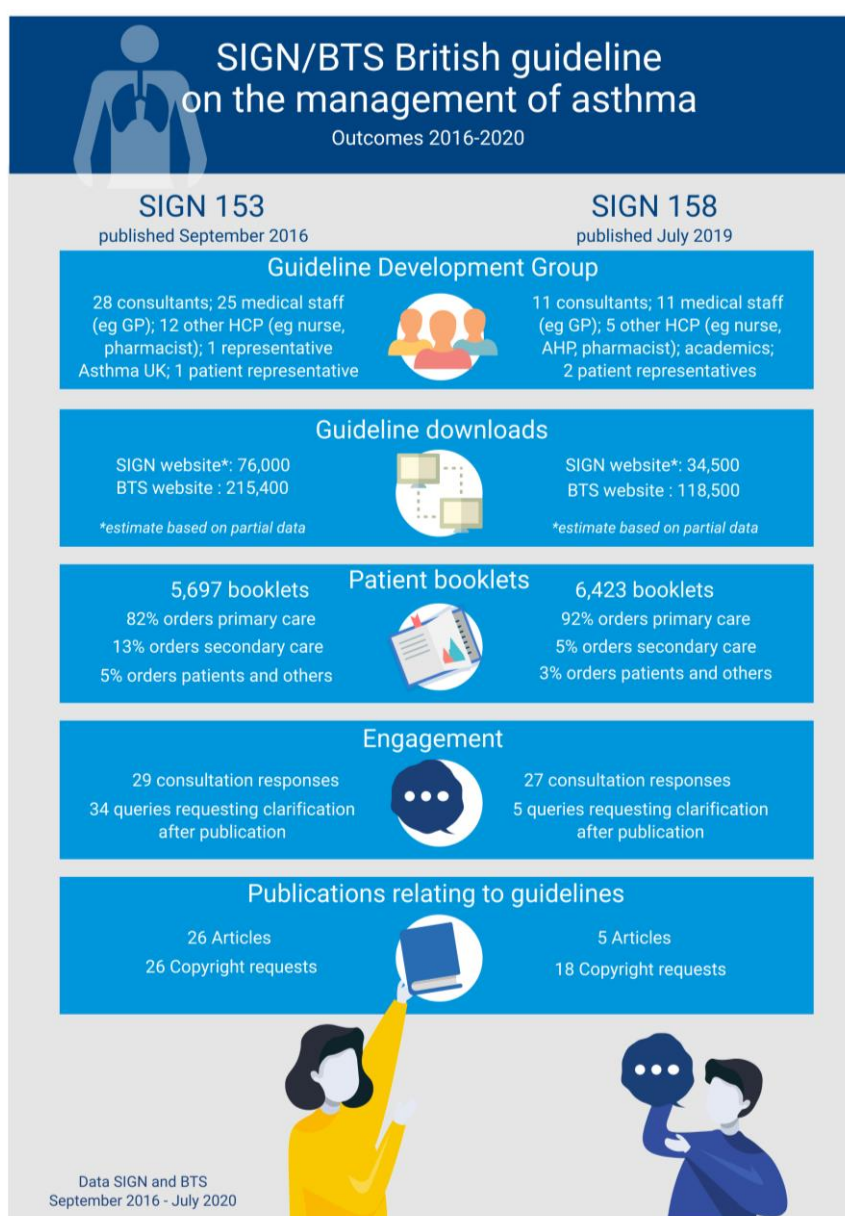
Angela Timoney, Chair SIGN Council

Sally Welham, Chief Executive, British Thoracic Society

## Executive summary

The Scottish Intercollegiate Guidelines Network (SIGN), part of Healthcare Improvement Scotland (HIS), collaborated with the British Thoracic Society (BTS) to develop a UK-wide guideline on the management of asthma. First published in 2003, the SIGN/BTS British guideline on the management of asthma was updated regularly, first annually and then biennially, with the most recent version being published in 2019. The aim of the guideline is to reduce unwanted variation in the diagnosis and treatment of asthma in children and adults and to improve outcomes for the approximately 8 million people with asthma in the UK. This report relates to the two most recent versions of the guideline published in September 2016 (SIGN 153) and July 2019 (SIGN 158).

The guideline development process for SIGN 153 involved 65 healthcare professionals, a representative from Asthma UK, and one patient representative. A change to the development process for SIGN 158 improved efficiency and reduced the number of healthcare professionals involved in the development to 27 plus two patient representatives. The reduced number of healthcare professionals continued to represent a wide range of expertise and topic knowledge.



A post publication survey of 86 healthcare professionals on SIGN guideline development groups, including eight involved in SIGN 153, showed that of these eight, the majority (7/8, 88%) reported that the considered judgement process (assessing the clinical relevance of study findings) was the most interesting/helpful part of the process. Nearly three quarters (5/8, 63%) described membership of the guideline development group as a learning opportunity, this is reflected in the feedback of members of other guideline development groups.

The training provided by SIGN, the guideline development group meetings, and shared learning had an impact on the group members' awareness of SIGN and its work, and on the skills and confidence of the healthcare professionals on the group. Most (6/7, 86%) of the healthcare professionals reported increased confidence in their interactions with their colleagues and/or managers and/or patients. Six of the eight healthcare professionals involved in SIGN 153 reported that they had changed some aspect of their clinical practice as a result of being on the guideline development group, and of these, four had 'changed a specific treatment or approach to patient care or management', demonstrating that being part of the group helps healthcare professionals to improve their topic knowledge and adapt their clinical practice in line with the latest evidence.

'SIGN is an excellent organisation and the whole experience is very positive.' – Consultant Respiratory Medicine

Key intended outcomes of the guideline work are 'Patients, carers and the community are aware of the guidelines' and 'Health and social care staff are aware of the guidelines'. High levels of engagement and awareness of the SIGN/BTS British asthma guidelines were evidenced by the number of downloads, with approximately 290,000 downloads of SIGN 153 and approximately 153,000 downloads of SIGN 158 (2016–2020). Furthermore, more than 12,000 patient booklets were ordered by patient organisations, primary care and secondary care healthcare professionals.

The patient booklets give patients, carers and voluntary organisations access to the latest evidence in an accessible format and provide information about relevant services. The patient booklets can help patients to feel better able to engage in discussions about their care and help them to make informed decisions about their care.

A total of 44 copyright requests for the reproduction of figures and tables from the guidelines were made and information from the guidelines was referred to in 31 published articles. A learning module, based on the guideline recommendations, was used by 1,112 healthcare professionals across the UK, who rated it as 'excellent' and described how it helped towards their 'critical ability to diagnose asthma'.

The collaboration between SIGN and BTS on the development of the asthma guideline was very positive and essential to the success of SIGN's only UK-wide guideline. The evidence on the impact of the guidelines as presented in this report will be used to inform and strengthen guideline development and implementation processes within SIGN and HIS.

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## 1. Introduction

In the UK, over 8 million people, or approximately 12% of the population, have been diagnosed with asthma. Approximately 160,000 people in the UK are diagnosed with asthma each year. Asthma accounts for 2–3% of primary care consultations, 60,000 of hospital admissions, and 200,000 bed days per year in the UK [Ref NICE, available at <https://cks.nice.org.uk/topics/asthma/background-information/prevalence/>, accessed 24 November 2021]. The rate of emergency hospital admissions for asthma varies widely between geographical areas, for example within Scotland in 2018–19 the number of emergency hospital admissions ranged from 51.2 to 140 per 100,000 people [Ref: ISD Scotland National Statistics Publication – September 2019. Long term condition diagnoses – Number of hospital stays and bed days by NHS board of residence, 2014–15 and 2018–19p]. Such wide variation underlines the need for the guideline and the importance of effective use of the guideline.

The SIGN/BTS British guideline on the management of asthma was first published in 2003 and has been updated annually (from 2004–2012) and biennially (2014–2019) since then. The ultimate aim of the guideline is to improve outcomes for people with asthma by encouraging improvements in care and management and reducing variations in care and outcomes across the UK.

The guideline covers the four countries of the UK and its development involved a range of healthcare professionals (HCPs), academics, a representative from Asthma UK, and three patient representatives as guideline development group (GDG) members. Many of the group members remained members of the GDG for a number of years and this provided opportunities for dissemination and implementation through having a dedicated, enthusiastic group of HCPs who embraced the ever changing evidence, discussed it at length and felt empowered to change the way things are done.

To analyse the impact of the SIGN/BTS British guideline on the management of asthma, data sets were collected using the SIGN contribution analysis framework. The information presented in this report relates to the two most recent updates of the SIGN/BTS British guideline on the management of asthma, SIGN 153 and SIGN 158. Information relating to SIGN 153 covers the whole period between publication and withdrawal of the guideline (21 September 2016 to 23 July 2019). Information relating to SIGN 158 covers the year following publication (24 July 2019 to 31 July 2020).



## 2. Data collection

Data sets containing quantitative and qualitative information were collected during the development, dissemination and implementation of the guidelines. The evidence presented in this report is specific to SIGN 153, published in September 2016 and SIGN 158, published in July 2019 and covers the period September 2016 to July 2020.

### 2.1 SIGN contribution analysis framework

SIGN developed a structured approach to collect quantitative data and qualitative feedback from stakeholders: the SIGN contribution analysis framework. This framework is used to consider the contribution that the SIGN guideline programme makes to improving care and outcomes of people with the conditions covered by SIGN guidelines. Three areas where SIGN guidelines may have an impact were identified as capacity change, behaviour change and wellbeing change. The outcomes in the framework were set in relation to these three areas and indicators were identified to support data collection. The indicators are relevant for all SIGN guidelines. Some additional indicators, specific to this guideline, have been added. These are identified as 'NEW' indicators in the framework. The framework was used to assess the specific contribution that SIGN guidelines make to any observed change or improvement in care and outcomes for patients.

Four groups of stakeholders were considered:

- patients, carers and members of the public
- health and social care staff and members of NHS boards
- people involved with SIGN guidelines, and
- SIGN/HIS.

The SIGN contribution analysis frameworks for each of these groups of stakeholders can be found in *Appendices A-D*.

### 2.2 Consultation on patient versions of the guidelines

As part of the development of the guidelines and patient versions of the guidelines (the 'patient booklets'), consultation was undertaken with patients, patient representatives, lay people and representatives from the voluntary sector.

### 2.3 Guideline development group members' survey

At various points in this report, reference is made to a post publication survey of GDG members. This GDG members' survey was administered to all HCPs on all SIGN GDGs whose guidelines were published between November 2013 and November 2017, including SIGN 153. The main purpose of the survey was to find out the extent to which SIGN GDG members were involved in implementation activities following publication of the guideline on which they had worked and also to find out if GDG members had changed their clinical practice as a result of being on the GDG group. To try to understand what factors might contribute to such activities and/or changes, questions were also included to elicit information on factors that might motivate HCPs to join a GDG and what the member got out of the experience. A total of 223 HCPs on 16 GDGs were contacted, including 14 HCPs who were involved in the development of SIGN 153. A total of 86 HCPs completed the survey, of whom eight were on the GDG of SIGN 153. The responses from these eight HCPs are included in this report, as they give insights into the impact of GDG membership on HCP capacity and behaviour. The outcomes of the GDG members' survey will be published in a separate publication in 2022.

### 3. Impact of guidelines on patients, carers and members of the public

The impact of the SIGN/BTS British guideline on the management of asthma was assessed against outcomes and indicators for patients, carers and members of the public in accordance with the SIGN contribution analysis framework (*Appendix A*). Nine outcomes were identified specifically for this stakeholder group.

#### 3.1. Outcome 1 - Patients, carers and the community are aware of guidelines/patient versions

An important aim of the guidelines is that patients, carers and the community are aware of the guidelines and the patient booklets. The experiences of patients, carers, patient representatives and the views of lay people inform guideline development. There was one patient representative and a representative from Asthma UK on the Steering Committee for SIGN 153 and two patient representatives on the GDG for SIGN 158.

For each edition of the asthma guideline, SIGN produced three patient booklets based directly on the guideline: *Managing asthma in adults*, *Managing asthma in children*, *Asthma in pregnancy*. These booklets provide a source of support and information for people with asthma and their carers by providing a lay summary in plain English of the main features of the guideline, including, for example, the diagnostic process, drug and non-drug treatments, preventing and managing asthma attacks. People with asthma and their carers who read these booklets will therefore have access to information about evidence-based care and treatment. One of the patient/patient representatives provided the following feedback on the patient version of the guideline:

'It is written in straightforward, non-alarming language involving patients' in decisions about seeking a diagnosis and considering options for treatment. It follows a step by step route on the final road to diagnosis and encourages compliance with evidence-based medicine. It explores the possibility of "trial and error" with different medications and treatments.' – Patient/patient representative

Awareness of the guidelines and patient booklets was raised at events, on social media, through networks and the SIGN and BTS websites. Between 2014 and 2020 awareness volunteers attended 23 events to raise awareness of SIGN guidelines and their associated patient booklets, including asthma.

On social media, five tweets alerting people the SIGN 153 patient booklets were sent out in 2017. The number of engagements ranged from 3 to 20. The SIGN 158 patient booklets were published in April 2020. As this was shortly after lockdown was imposed because of the COVID-19 pandemic, no tweets were sent out at the time the patient booklets were published.

All SIGN guidelines, patient booklets and supporting materials are freely available on the SIGN and BTS websites. In addition, printed copies can be ordered from SIGN. Data on the number of orders for the SIGN 153 and SIGN 158 full guideline, the quick reference guide and the patient booklets were collected for the period September 2016 to July 2020 (*see Appendix E*).

Four patients ordered printed copies of the guideline: three ordered SIGN 153 and one ordered SIGN 158. One patient ordered 10 copies of the SIGN 153 Quick Reference Guide and four patients

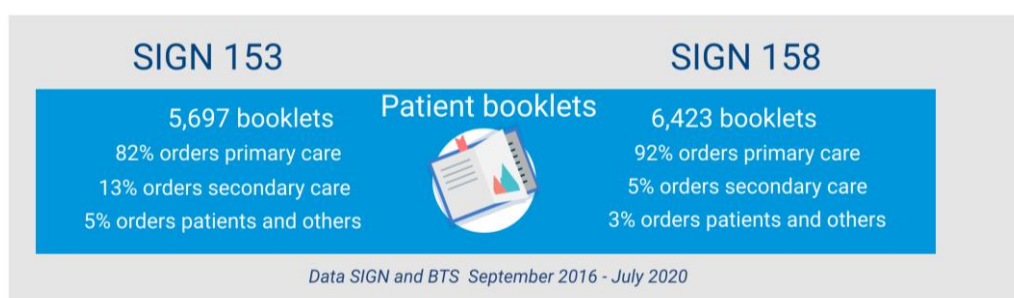
ordered a total of seven copies of the SIGN 158 Quick Reference Guide. Six patients ordered a total of 63 copies of the SIGN 153 patient booklets and one patient ordered one copy of the SIGN 158 patient booklet.

Three non-NHS organisations, which include voluntary organisations working with patients, ordered 19 copies of SIGN 153 and one organisation ordered one copy of SIGN 158. Two organisations ordered 30 copies of the SIGN 153 quick reference guide. Nine organisations ordered 68 SIGN 153 patient booklets and four organisations ordered 40 SIGN 158 patient booklets.

The large majority of items which were sent out in hard copy were patients booklets, for SIGN 153, 88% (5,697/6,504) of items were patient booklets, and for SIGN 158, 95% (6,423/6,777) of the items were patient booklets. Out of the 293 orders for SIGN 153 patient booklets, 239 orders (82%) were from HCPs working in primary care (particularly GP practices), 39 orders (13%) were from HCPs working in secondary care, and the remaining 15 orders were placed by patients and others (non-NHS organisations). For SIGN 158, out of the 184 orders for patient booklets, 170 orders (92%) were from HCPs working in primary care (particularly GP practices), 9 orders (5%) from HCPs in secondary care, and patients and non-NHS organisations placed the remaining 5 orders (3%).

The number of patient booklets that were distributed in response to orders received by SIGN for each of the stakeholder groups is shown in *Figure 1*.

*Figure 1: Number of patient booklets distributed in response to orders from stakeholders*



### 3.2 Outcome 2 - Patients and carers know what to expect regarding evidence-based care

During the consultation on the patient version of the guidelines, the patient/patient representatives emphasised the importance of sharing the quality of evidence in patient-facing literature:

‘I love that you make it clear what the quality of evidence is. So often this is not communicated in patient-facing literature and we have to read the full guideline aimed at doctors. I think it's really helpful and important to understand what is backed by strong, or less strong evidence, what is based on clinical practice that seems to work, and what we don't have any evidence for (or maybe have evidence against!)’ – Patient/patient representative

The GDG members’ survey showed that HCPs referred to the guideline in their discussions with patients, therefore patients receive more information about evidence-based care.

### 3.3 Outcome 3 - Patients and carers know where else they can go for support

The clinical guideline and the patient booklets provide a list of organisations offering advice and support to people with asthma and their carers, including relevant contact details and information about helplines. The information is checked and updated for each published edition of the guideline and, if necessary, is amended between editions in the online versions. The information is therefore available to anyone, HCP, patient/carer or other organisation, who has access to these guideline materials either online via the SIGN or BTS websites ([www.sign.ac.uk](http://www.sign.ac.uk); [www.brit-thoracic.org.uk](http://www.brit-thoracic.org.uk)) or as printed copies.

One patient/patient representative emphasised the importance of access to a range of information before patients talk to the different healthcare professionals:

‘The range of information provided enables those using it to find advice appropriate for their needs. The content is clearly set out from the beginning, defining the condition and its symptoms so that its readers can check out their condition before approaching a GP and later the condition specific nurse and secondary care staff involved in looking after them.’  
– Patient/patient representative

The information provided also helps patients and carers by letting them know where to go for support and more information:

‘It gives useful signposts to more information and support.’ – Patient/patient representative

### 3.4 Outcome 4 - Patients and carers feel more informed in discussions with health and social care staff

As part of the consultation on the patient booklets, comments were received that demonstrate that the booklets, which are based directly on the clinical guideline, helped patients to feel they had more information and were involved in their care.

One of the reflections on the patient booklets focused on the content:

‘Overall, the content is informative. It contains a large amount information that will be useful for people with asthma.’ – Patient/patient representative

When patients feel more informed this promotes self management of their condition, as this patient describes when talking about the patient booklets:

‘The whole tone is one of involving the patient in their own asthma journey and a variety of challenges associated with the condition... Self management and evidence base are central, fully explored and discussed without recourse to jargon or making decisions solely those of clinicians. Knowing about the evidence will help us work in partnership with our care team better.’ – Patient/patient representative

### 3.5 Outcome 5 - Awareness of SIGN and its role is raised

Patients, carers and relevant voluntary sector organisations are invited to comment during the open consultation phase of guideline development. Two lay people submitted comments as part of the open consultation on the draft guideline of SIGN 153, and one lay person submitted comments on SIGN 158. These comments were reviewed by the GDG along with all other comments received.

Responses received during open consultation for the current edition of the guideline can be viewed in the consultation report, available on the asthma homepage on the SIGN website ([www.sign.ac.uk](http://www.sign.ac.uk)) for the lifetime of the guideline.

Changes to the format of the SIGN patient booklets, based on the findings from DECIDE research project, were seen as a positive development, as shown in the following feedback from patients/patient representatives:

‘The altered format of SIGN patient guidelines facilitates this involvement of patients and carers in evidence based decisions about their care and hopefully improve outcomes for them as a result.’ – Patient/patient representative

The importance of clear graphic information was highlighted:

‘Excellent graphic information and SIGN specific information.’ – Patient/patient representative

### 3.6 Outcome 6 - Patients and carers are better able to engage in discussing their care

The information provided in the patient booklets, 12,120 of which were distributed across the UK, helps patients to engage in their care. One patient/patient representative emphasised that the information enabled patients to provide meaningful contributions:

‘The variety of presentation of information allows patient involvement in treatment to the maximum and enables them to contribute meaningfully to dialogue with clinicians and all those involved in their treatment.’ – Patient/patient representative

### 3.7 Outcome 7 - Patients and carers value being involved with SIGN and want to work with us

Eleven individuals took part in consultation on the asthma patient booklets, and quotes from their feedback are used in this section of the report. Two lay people submitted comments as part of the open consultation on the draft SIGN 153 and one for SIGN 158. Both the patient representatives on the GDG for SIGN 158 attended the training session for developing patient booklets. Opportunities to be involved with SIGN are valued by patients.

One of the patients/patient representatives on the guideline group commented that they would have liked to be involved more:

‘I wanted use my own experiences to highlight the things that are important for patients. I would like to have been involved more.’ – Patient/patient representative

### 3.8 Outcome 8 - Enable people to make informed decisions about their own care and treatment

This outcome was identified to assess wellbeing changes relating to patients, carers and members of the public as a result of the asthma guidelines, and links directly to the current HIS strategic priorities. To be able to make informed decisions, patients and carers need to have access to the evidence about asthma care in a suitable format. The patient booklets can help patients and carers to access the latest evidence as this patient representative describes:

‘Very useful, and does help patients and carers understand what the latest evidence supports.’ – Patient representative

To help people to make informed decisions the information provided needs to be clear and jargon free as highlighted in this comment:

‘The content gives information on a clear and jargon free manner and involves them [patients] in all aspects of their care.’ – Patient representative

### 3.9 Outcome 9 - Provide evidence and share knowledge that enables people to get the best out of the services that they use and help services to improve

Patients and patients’ representatives highlighted the importance of self management of asthma during the consultation on the patient versions of the asthma guidelines. The patient booklets for SIGN 153 and SIGN 158 share information about services and provide evidence on asthma management.

One of the patient/patient representatives described that information was presented clearly:

‘It clearly sets out medication, inhalers and also additional approaches to help manage the condition. It explores self management.’ – Patient/patient representative

The value of the patient booklets in self management was recognised by this patient/patient representative:

‘I also like the space to make notes. It means the booklet becomes part of a person’s own self management regime.’ – Patient/patient representative

One of the lay people on the guidelines group described the expected impact of the guidelines on outcomes for patients:

‘Outcomes should improve as a result of adherence particularly in teenage groups.’ – Lay person on guideline development group

## 4 Impact of guidelines on health and social care staff and NHS boards

The impact of the SIGN/BTS British guideline on the management of asthma was assessed against outcomes and indicators for health and social care staff and boards (*Appendix B*). Eight outcomes were identified to assess capacity change, behavioural change and wellbeing changes for this stakeholder group.

### 4.1 Outcome 1 - Health and social care staff are aware of relevant guidelines/patient versions

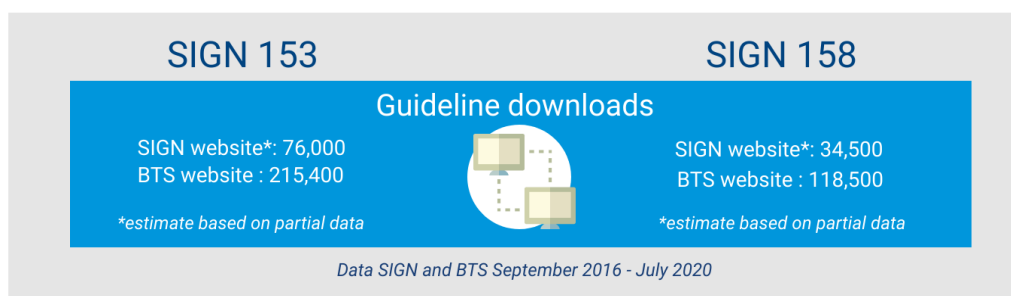
In line with the standard dissemination process used by SIGN, all NHS boards in Scotland were notified of the publication of the SIGN/BTS British asthma guidelines. A survey of NHS boards undertaken by SIGN in 2014 found that many boards had processes in place to promote the sharing and implementation of guidelines.

For SIGN 153, HCPs ordered 29 guidelines, 716 Quick Reference Guides (QRG) and 5,566 patient booklets. Printed copies of the QRG and patient booklets were ordered by HCPs in all but one area (NHS Dumfries & Galloway). NHS Fife placed the most orders (n=69), followed by NHS Lothian (n=48) and NHS Tayside (n=46). In total, orders were sent out to 255 different organisations, predominantly GP practices (n=154), but including health centres (n=61), hospitals (n=21) and other (n=19). Almost all orders were placed in 2016 (publication was in September 2016) and 2017, with a small number placed in 2018 and 2019.

For SIGN 158, between publication (24 July 2019) and July 2020, HCP ordered 12 guidelines, 333 QRG and 6,382 patient booklets. As at 31 July 2020, NHS Fife placed the most orders (n=43), followed by NHS Tayside (n=38) and NHS Highland (n=14). In total, orders were sent out to 113 different organisations, predominantly GP practices (n=75), but including a few health centres (n=19), hospitals (n=7) and others (n=12). Just under 60% of orders were placed in 2019 (publication was in July 2019), the remainder in 2020 (January-July).

The website download numbers are summarised in *Figure 2*.

*Figure 2: Downloads of the SIGN/BTS British guidelines for asthma from SIGN and BTS websites*



When looking at the detailed download data for SIGN 153, there were 19,207 downloads from the SIGN website for the eight months from June 2017–January 2018, and 13,668 downloads for the seven months from January 2019–July 2019. As a result of the migration of the website, download data for the other months are not available. It was estimated that SIGN 153 was downloaded

approximately 76,000 times in total (September 2016–June 2019). The numbers and calculations can be found in *Appendix F*.

The BTS website recorded 215,400 downloads of SIGN 153 between September 2016 and June 2019 (the lifetime of the guideline). In addition, there were 153,600 downloads of the SIGN 153 QRG. SIGN 153 was superseded by SIGN 158, published on 24 July 2019.

In the six months following publication of SIGN 158 (24 July 2019– January 2020) there were 17,683 downloads of the guideline from the SIGN website. It was estimated that SIGN 158 was downloaded 34,500 times from the SIGN website during the first year after publication. Between July 2019 and July 2020, the BTS website recorded 118,500 downloads of SIGN 158 and 90,500 downloads of the SIGN 158 QRG.

For SIGN 153, five tweets were sent out following publication of the clinical guideline and QRG. Engagement figures recorded ranged from 24 to 53. The highest engagement rates were for tweets about the new diagnostic algorithm in SIGN 153 and the notification of the publication of the updated edition of the guideline. For SIGN 158, eight tweets were sent out following. The number of engagements per tweet ranged from 7 to 78, and the highest engagement was with a tweet alerting people to the publication.

## 4.2 Outcome 2 - Health and social care staff understand the purpose of the guideline

For SIGN 153, 29 responses were submitted to the open consultation/peer review process on the draft guideline. Of these, 19 completed responses were from HCPs or their associated Royal Colleges/other professional organisations (n=11 and n=8, respectively). For SIGN 158, 12 of the 27 completed responses were from HCPs or their associated Royal Colleges/other professional organisations (six responses from each) and two were from other NHS organisations). The responses from Royal Colleges and other organisations may have been from an individual, possibly a HCP, or be collated comments from a range of staff (not members of the GDG), so the exact number of those who contributed a response is not known.

Healthcare professionals show a strong engagement with the guidelines and ask for clarification to ensure they understand how to implement the guidelines to best treat patients. Following publication of each update to the guideline, enquiries were received from users of the guideline about various aspects of the guideline text and recommendations, for example, directly querying the advice given, or seeking clarification of a particular point, or requesting advice on how to treat a particular patient who did not fall into the categories specified. These enquiries were received directly by SIGN and BTS and those that could not be answered by the staff at either organisation were referred on to the guideline group Chairs and/or appropriate member/s of the guideline Steering Committee for resolution. The number of queries that SIGN and BTS staff were able to answer was not recorded so is not reported here.

Following publication of SIGN 153, 34 queries were referred on to the group Chairs/members. These queries were received from a wide range of HCPs, mostly medical staff (n=11) and pharmacists (n=12), and from others, including people involved in providing information to others, for example the British National Formulary, the Medicines and Healthcare Regulatory Authority, Asthma UK and clinical governance staff from across the UK. Issues were raised during the period September 2016, when the guideline was published, to February 2019, just 5 months before the next update was published. This illustrates that the guideline was in use throughout the period between updates and



was not just being looked at immediately following publication; thus suggesting that it was an enduring resource for HCPs.

Over a third of the issues involved HCPs seeking advice or clarification about some specific aspect of care or treatment covered by the guideline (35%, 12/34). Of these, half were felt to justify consideration for inclusion in the next update to the guideline. More than half of all issues raised (59%, 20/34) could not be resolved by the GDG and were taken forward for consideration in the next update to the guideline. This is therefore one way in which the guideline content is shaped by the HCPs who use it and demonstrates that it is being closely read to provide answers to specific clinical questions or situations. A further six issues raised demonstrated use of the guideline in day-to-day clinical practice as they involved queries about how to implement specific recommendations and sometimes related to the care of an individual patient.

Following publication of SIGN 158, five queries were referred on to the group Chairs/members between August and December 2019. Two of these queries were received from HCPs, (one pharmacist, one nurse), the remaining three were from pharmaceutical companies and related to specific device/dosage combinations.

The issues raised that were referred on to the GDG for resolution were categorised by the impact of the request and by outcome. The information is summarised in *Figure 3* and details about the impact categories and outcome for each request can be found in *Appendix G*.

*Figure 3: Engagement with the guidelines during consultation and following publication*



### 4.3 Outcome 3 - Awareness of SIGN and its role is raised

Awareness of the SIGN guidelines and SIGNs role was raised through publications, the SIGN and BTS websites and at the BTS winter meetings.

At the BTS winter meetings, members of the GDG presented the draft guideline recommendations to HCPs. Up to 180 HCPs attended in December 2015 (SIGN 153) and up to 110 HCPs attended in December 2018 (SIGN 158). These events, held in London, were attended by respiratory physicians and specialists from across the UK. Feedback about the guidelines from the sessions is recorded and summarised before being discussed, in conjunction with the feedback received in response to the formal, written consultation, by the GDG at their next group meeting. The sessions allowed HCPs who were not involved in development of the guideline to hear about the main changes that are proposed for the next update and to discuss these and any concerns they might have, directly with the GDG members. This opportunity for open debate is an important aspect of the guideline development process for this guideline and contributes to the high level of clinical buy-in that the guideline attracts.

Awareness of SIGN was further raised when other authors included materials derived from SIGN 153 and SIGN 158, for example figures and tables, in their publications. A total of 26 copyright requests for SIGN 153 were received between September 2016 and December 2018:

- 5 were for inclusion in book chapters (2 for academic textbooks)
- 10 were for inclusion in articles for publication (5 of them in peer-reviewed journals)
- 3 were for local NHS use (to display summary of pharmaceutical management tables on walls in the hospital, inclusion in a local Trust App, inclusion in a local protocol), and
- 8 were for inclusion in promotional, educational and other materials produced by pharmaceutical companies.

For SIGN 158, between publication on 24 July 2019 and May 2020, a total of 18 copyright requests were received:

- 5 were for inclusion in book chapters (2 for academic textbooks)
- 7 were for inclusion in articles for publication (5 of them in peer-reviewed journals) or other guidelines
- 3 were for inclusion in promotional, educational and other materials produced by pharmaceutical companies, and
- 3 were for inclusion in CPD training modules.

The details of the copyright requests and the outcome for each request is shown in *Appendix H*.

#### 4.4 Outcome 4 - Boards, team and departments use evidence-based guidance to review and update existing practice and policy

All NHS boards are notified when guidelines are published and sent a link to access the guidelines. In addition, NHS organisations can order copies of the guidelines.

The All Party Parliamentary Group for Respiratory Health referred to the SIGN/BTS guidelines in their report 'Improving Asthma Outcomes In The UK' and highlighted the importance of UK-wide guidelines to prevent delays in treatment, variations in patients' diagnosis and differences in treatment [APPG for Respiratory Health, November 2020].

'Opportunity to improve knowledge of own clinical area' was given as one of the impacts of being on the GDG for asthma guideline group members. One of the HCPs on the GDG described being involved in guideline development as an 'Opportunity to influence clinical practice' and they promoted the use of evidence-based guidance by writing articles:

'I wrote an update for BMJ clinical evidence and also a review article for Paediatrics and Child Health.' – Respiratory Consultant

The impact of the SIGN/BTS guidelines was wide-reaching and described as global by one of the international researchers who responded to the consultation:

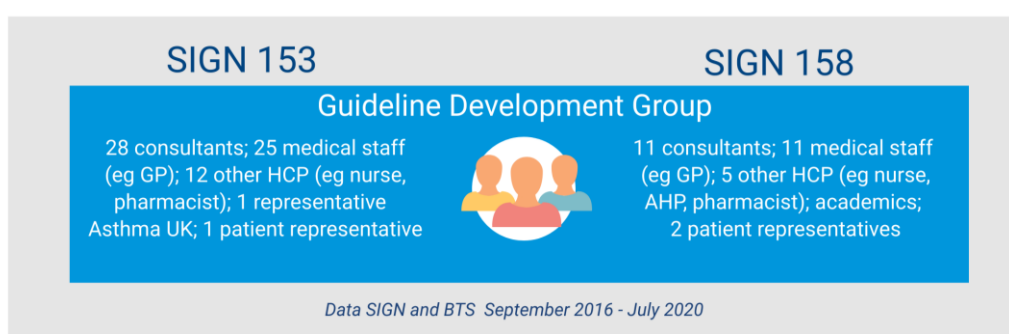
'The 2019 BTS/SIGN Asthma Guidelines is an impressive document presenting practical evidence-based recommendations in a clear easy to follow format. As with earlier editions, the guidelines will be widely read and followed globally.' – Medical Research of New Zealand

#### 4.5 Outcome 5 - Boards and clinicians value being involved with SIGN and want to work with us

Prior to the start of each guideline update, an advert is placed on the BTS website and notification is sent to relevant organisations that recruitment of new GDG members is taking place. Recruitment is usually for HCPs with an interest in specific topic areas. The recruitment process is managed by BTS. For SIGN 153 there were 61 applications to be part of the GDG. For SIGN 158, there were 44 applicants. The number of applicants is far higher than the number of available places, as GDG membership is reviewed in a staggered fashion, showing the level of interest among HCPs in being involved in development of the asthma guideline.

An overview of the composition of the GDGs for SIGN 153 and SIGN 158 is shown in *Figure 4*.

*Figure 4: Members of the group developing the SIGN/BTS British guidelines on the management of asthma*



A total of 65 HCPs on the GDG Steering Committee and GDG Evidence Review Groups (ERG) were involved in the development of SIGN 153. Of these, 47 (72%) were based in England, 17 (26%) in Scotland and 1 (1%) in Wales.

A total of 27 HCPs were on the GDG for SIGN 158. Of these, 18 (67%) were based in England, 7 (26%) in Scotland and 2 (7%) in Wales. The number of HCPs involved in SIGN 158 was lower than the number of HCPs involved in SIGN 153 because the decision was taken to make the guideline development process more manageable by reducing the number of HCPs involved. This was done by disbanding the ERGs, changing the Steering Committee into a core GDG, and adding new non-core members to help with the literature review. The breakdown of GDG members by professional group is shown in *Table 1*.

*Table 1: Summary of HCP GDG members, SIGN 153 and SIGN 158*

Professional group	SIGN 153		SIGN 158	
	n	%	n	%
Consultant physician/ surgeon	28	43	11	41
Other medical staff, eg GP	25	38	11	41
Nurse	7	11	2	7
AHP	0	0	1	4
Other HCP, eg, pharmacist	5	8	2	7
<b>Total</b>	<b>65</b>	<b>100</b>	<b>27</b>	<b>100</b>

Being a member of a SIGN GDG requires a considerable time commitment and members sometimes had difficulty finding time to do the necessary work. This is reflected in the GDG members' survey

which showed that three of the eight members of the SIGN 153 GDG did guideline work in their own time. One of the members of the asthma GDG commented on this:

‘No time to do this, all done in my “own time” but I knew that this was the case and am happy with this albeit it is a negative aspect.’ – Consultant Respiratory Paediatrics

It is interesting that, despite the amount of work involved and time pressures, many HCPs remained on the group for several updates. This suggests that the benefits, such as influencing clinical practice and personal development, outweigh any drawbacks.

Responses to the GDG members’ survey showed that out of the eight HCPs on the Steering Committee of SIGN 153 who responded, four felt honoured to be asked to join the group and four highlighted the opportunity it presented to influence clinical practice. Other HCPs who were not on the GDG were asked to comment on draft guidelines. Their feedback shows they also valued being involved with SIGN:

‘Thank you for allowing me to comment on this update. The guideline is of high quality and provides a great resource for clinicians. Thank you to the GDG members involved in updating this guideline.’ – Consultant Respiratory Physician

#### 4.6 Outcome 6 - Health and social care staff use SIGN guidelines as part of shared decision making with patients and carers

The HCPs on the guideline development group are experts in their field. The feedback from HCPs involved in the development of the asthma guidelines showed how the guidelines development process had impacted on their clinical practice. For SIGN 153, 43% (3/7) of HCPs who had changed some aspect of their clinical practice said that they now used the guideline as a reference when discussing care and treatment options with patients and a third (29%, 2/7) said they were more confident about discussing treatment options with patients/carers. These guideline-informed discussions help patients know what to expect and what treatment options there are.

#### 4.7 Outcome 7 - Health and social care staff feel reassured to know they are using the latest evidence to help their patients

The asthma guidance in the British National Formulary (BNF) is based on the recommendations provided in the pharmacological management section of the SIGN guideline. The guideline is therefore directly influencing treatment decisions made by HCPs in primary and secondary care through their use of the BNF to guide treatment decisions. For SIGN 153, and the previous update, BNF themselves sought clarification of issues they had identified with the guideline during their process for updating the BNF.

## 4.8 Outcome 8 - Provide evidence and share knowledge that enables people to get the best out of the services that they use and help services to improve

This outcome was identified to assess wellbeing changes relating to health and social care staff and members of NHS boards, and this relates specifically to the HIS strategic priorities. The purpose of clinical guidelines is to provide evidence-based recommendations for care and treatment based on a systematic review of the available published literature.

The knowledge captured within SIGN 153 and SIGN 158 was shared with the wider clinical community, as demonstrated by the range of requests for copyright permission to reproduce tables and figures from the guideline, as well as a range of publications quoting information from the guidelines. A summary is shown in *Figure 5*.

*Figure 5: Publications and copyright requests relating to SIGN 153 and SIGN 158*



SIGN is aware of 26 articles, referring to SIGN 153, published between October 2016 and April 2019, including an online learning module in the British Medical Journal (*BMJ*). Nine of these were published in peer-reviewed journals, six in the *BMJ* and three in *Thorax* which are both high impact journals in this field. One of these comprised six rapid responses from HCPs to an editorial about the guideline in the *BMJ*; three of these responses were subsequently published as letters in the *BMJ*. Fourteen of the articles, all of them written by medical doctors, were published in the online journal '*Guidelines in Practice*', a commercial site run by MGP Ltd, aimed at primary care practitioners. Two of the articles were summaries of the guideline (one on asthma in adults and the other on asthma in children). The three remaining articles were published by the Primary Care Respiratory Society, The Chartered Society of Physiotherapists and The Scottish Government. The latter was part of a publication called *Quality Prescribing for Respiratory. A Guide for Improvement 2018–21*.

Of the 26 articles published:

- 14 reproduced text, tables or charts from the guideline
- 7 commented on or discussed the guideline, and
- 5 only cited or referred to the guideline.

During the first year following publication of SIGN 158 on 24 July 2019, SIGN are aware of five articles about the guideline that have been published. These comprised an editorial and a letter in the *BMJ*, two articles summarising the management of asthma in adults and children in *Guidelines in Practice*, and an article (published November 2019) about predicting future risk of asthma attacks, also published in *Guidelines in Practice*, that included a 5-question online learning module developed by a respiratory physician on the GDG. This was assigned 0.5 CPD credits by *Guidelines in Practice*, and it was estimated it would take 30 minutes to complete. By May 2020, the article had had 2,648 page views from 2,331 different users. SIGN 158 is referenced in the NICE Quality Standards on asthma, and also in the standards for the National Asthma and COPD Audit Programme ([nacap.org.uk](http://nacap.org.uk)).

## 5 Impact of guidelines on people involved with SIGN guidelines

Eight outcomes were identified to assess capacity change, behaviour change and wellbeing change relating to people involved with SIGN guidelines, this includes people who are members of the GDG and people and companies who provide feedback during the open consultation, except patients and carer representatives (see Appendix C).

### 5.1 Outcome 1 - People acquire skills in interpreting and understanding evidence

All members of SIGN GDGs have to undergo training in order to participate in the guideline development process, including training in how to undertake 'considered judgement' – the assessment of evidence to determine its clinical importance and relevance. In addition, members of the asthma GDG received detailed training on critical appraisal as, unlike other SIGN GDGs, they critically appraised all the relevant literature using a standard SIGN approach and forms. This training was essential to ensure that all members were approaching the evidence in the same way.

For SIGN 153, three combined SIGN methodology/critical appraisal training days were held. GDG members were required to attend one of these sessions. Each day comprised a two-hour session covering methodology and a four-hour training session on critical appraisal. The critical appraisal training involved lecture-style presentations from the SIGN Programme Manager and Evidence and Information Scientist plus practical exercises and group work. Attendance was mandatory, even for members with previous experience of critical appraisal in one form or another, as the training provided the opportunity to try out the standard SIGN checklists and other tools and ensure that all members were approaching this vital task in the same way and in accordance with SIGN methodology. Of the HCPs on the GDG, 19 (70%) attended the SIGN methodology training session on 5 December 2018. Of the eight who didn't attend, seven had attended on a previous occasion.

For SIGN 158, twenty of the 27 HCPs (74%) on the GDG attended the full-day SIGN critical appraisal training session on 16 March 2019. Of the seven who didn't attend, five had attended a similar session during a previous update and one was an expert in the field. The critical appraisal training followed the same format as for SIGN 153. The SIGN methodology training session was attended by 19 members.

Eight HCPs on the SIGN 153 GDG responded to the SIGN survey asking them to reflect on their experience of being part of the guideline development group. In response to the question, 'Which of the following aspects of the SIGN guideline development process did you find most interesting or helpful?' most, (7/8, 88%) said 'Considered judgement'. The same proportion said that reading the selected literature papers was an interesting or helpful part of the process. The responses show the value of the training provided by SIGN and how HCPs use these skills to understand evidence.

### 5.2 Outcome 2 - People have a greater understanding of evidence-based practice

There were 65 HCPs and one lay representative on the ERG for SIGN 153. Each ERG (n=12) was chaired by a HCP who also sat on the guideline Steering Committee. Members of the ERGs did not meet regularly and most meetings were remote. The guideline Steering Committee met regularly and discussed the evidence reviews undertaken by the ERGs and discussed and agreed the final guideline.

The Steering Committee comprised 19 members: 14 HCPs, including the Chairs of all the ERGs, plus two members from SIGN, two from BTS and one from Asthma UK. There were seven Steering Committee meetings over the guideline development period. The overall attendance rate at the first six meetings of the Steering Committee meetings was 70% (range 47% to 93%). Two of the meetings were held by teleconference. Individual attendance ranged from 100% (three individuals) to 33% (one individual).

For SIGN 158, there were 27 HCPs and two lay representatives on the GDG. There were seven GDG meetings over the guideline development period for the core asthma GDG (n=18) and four meetings for core and non-core (n=9) members. Individual attendance at GDG meetings ranged from 100% (two individuals) to 22% (one individual). Collectively, these 27 HCPs attended 775 hours of meetings (155 meetings averaging 5 hours in duration) over the course of the guideline.

The training, meetings and shared learning had an impact on the confidence of the HCPs on the GDG. All but one of the HCPs who responded to the survey (6/7, 86%) reported increased confidence in their interactions with their colleagues and/or managers and/or patients.

### 5.3 Outcome 3 - People improve their knowledge of the topic

The educational aspects of GDG membership were identified as important by the majority of HCPs on SIGN 153 who responded to the GDG members' survey. Of the eight who responded, five (63%) described the GDG membership as a learning opportunity, five (63%) saw it as an opportunity to improve knowledge of their own clinical area, and three (38%) saw it as an opportunity for personal development.

Six HCPs involved in SIGN 153 reported that they had changed some aspect of their clinical practice as a result of being on the GDG, this included 'Changed a specific treatment or approach to patient care or management', demonstrating that being part of the GDG helps HCPs to improve their topic knowledge and adapt their clinical practice in line with the latest evidence.

### 5.4 Outcome 4 - People are able to contribute to creating evidence-based recommendations

All members of the GDG for SIGN 153 and SIGN 158 were involved in critical appraisal of the selected literature for the key questions to which they were assigned. Reading the literature papers is a prerequisite of undertaking the considered judgement stage of the process. The GDG members were involved in the considered judgement process during which draft evidence statements and recommendations are made. When undertaking considered judgement, GDG members initially work with the others assigned to each key question, but once the drafts are completed, further discussion and refinement was undertaken by the Steering Committee, for SIGN 153 and by the whole GDG for SIGN 158.

In addition to responses to the open consultation/peer review from HCPs, Royal Colleges/other professional organisations and NHS organisations, eight pharmaceutical companies submitted comments in response to the open consultation on the draft guideline for SIGN 153 and seven pharmaceutical companies and one device manufacturer submitted comments in response to the open consultation on the draft of SIGN 158.

One of the pharmaceutical companies responded to the open consultation on SIGN 158 with the following comment:

‘[We] would like to ensure the guideline is up to date, forward facing and provides guidance for best-practice patient care for asthma patients of all severities. The draft SIGN/BTS guidance may impact prescribing patterns in therapy areas in which [we] currently promotes medicines. [We] would like to thank you for the opportunity to comment.’ – Pharmaceutical company

Another pharmaceutical company responding to the open consultation of the draft guidelines with the following feedback:

‘The draft SIGN recommendation will have an influence on the prescribing of [our] respiratory products. [We] would like to thank BTS/SIGN for the opportunity to comment on the draft British Guideline on the Management of Asthma. We recognise the volume and complexity of the task which BTS and SIGN have undertaken and its desire to assess the full body of clinical evidence. We would like to congratulate BTS/SIGN on producing a leading guideline on asthma care in the UK.’ – Pharmaceutical company

## 5.5 Outcome 5 - Awareness of SIGN and its role is raised

The survey responses from HCPs on the GDG demonstrate that being part of the guideline development process offers HCPs opportunities to learn new skills relating to evidence review and get an in-depth understanding of the SIGN guideline development process. The appreciation for the work done by SIGN is evident from this comment:

‘SIGN is an excellent organisation and the whole experience is very positive.’ – Consultant Respiratory Medicine

This consultant recommended joining a GDG to other clinicians:

‘A very positive experience which most clinicians should do at one time or another.’ – Consultant Respiratory Paediatrics

## 5.6 Outcome 6 - People use their knowledge of interpreting evidence to inform their work/contribution and to maintain published guideline

In a few cases knowledge of the topic gained during the guideline development process directly affected the course of the individual member’s career. For example, one GP member of an ERG for SIGN 153 was awarded a clinical PhD fellowship from the Chief Scientist Office of the Scottish Government to develop a clinical prediction rule for diagnosing asthma. The member’s interest in this topic stemmed directly from their membership of the GDG and, in particular, their becoming aware of the complexities of asthma diagnosis and the gap in the evidence relating to this and their awareness that this meant that there remained important unanswered clinical questions.



Following publication of each update, feedback from GDG members, particularly for the asthma guideline where work is more or less continuous, is common. GDG members may alert other members and the programme manager to new evidence or new interpretations of existing evidence and this sometimes sparks debate between members in between updates. Where relevant, such issues are noted for inclusion in the scoping phase for the next update.

## 5.7 Outcome 7 - People are topic champions and encourage change in their area of interest

The survey of GDG members showed that members were involved in various dissemination activities following publication of the guideline and these activities will have raised awareness of the guideline, particularly within the clinical community but also further afield.

As part of the survey, GDG members were asked if they had actively promoted the guideline in any way following publication. Six of the eight respondents said they had, and all said they had promoted the guideline in more than one way (average 5.8 ways, range 2–8 ways). The most frequently selected responses on how they promoted the guideline were:

- I discussed the guideline at multidisciplinary meetings (5/6)
- I gave a presentation about the guideline at a meeting or conference (5/6), and
- I referred to the guideline in written reports (5/6).

All three of these approaches have the potential to influence the behaviour of others, both immediate colleagues and the wider clinical community, not just to raise awareness of the guideline as they involve that most powerful approach – peer to peer learning.

One consultant in respiratory paediatrics commented in the survey that they now make a point of discussing the evidence, or lack of it, with the parents of children with asthma.

Of the 26 published articles about SIGN 153 that SIGN are aware of, eight were written by or written with involvement of GDG members, five of them published in peer-reviewed journals, and six by previous members. Of the five published articles about SIGN 158, two were written by GDG members. These articles will have raised awareness of the clinical issues pertinent to the care and management of people with asthma.

A clinical lecturer on the GDG for SIGN 153 commented that they were now using what they learned from being on the GDG in their lectures to clinical undergraduates, thus directly influencing the next generation of doctors.

A GP member of one of the ERGs for SIGN 153 had an article about the diagnosis of asthma published in the *BMJ* that included an online learning module they had developed as a direct result of their work on the guideline. This module was assigned 0.5 CPD credits by the *BMJ* and within a month of its publication, 11 other organisations internationally had accredited the module. Within four months, 1,112 people (mostly UK-based GPs) had completed the module and 246 had provided comments on it which were overwhelmingly positive with most of those who rated it, giving it four or five stars (out of five stars).

Feedback from HCPs, mostly GPs, who completed the learning module included:

‘Fantastic module! I will use this information regularly in everyday practice’– HCP

It clarified the steps needed for diagnosis for these HCPs:

‘I found this very useful. I am much clearer in how to diagnose and manage asthma based on the varying degrees of probability.’– HCP

‘The module helped my critical ability to diagnose asthma and exclude COPD.’– HCP

For this GP it also provided clarification, which resulted in them planning review of their asthma patients:

‘Excellent, seems so clear now! ... At least for a GP not in contact with diagnosis so much. Must review a lot of the “asthmatics”.’– GP

The learning module was considered very valuable:

‘Excellent key points. Good case scenarios. A practical and pragmatic module. Very valuable for everyday general practice.’– GP

The guidelines-based training module has directly influenced the behaviour of other clinicians, in this case GPs. GPs are the main providers of clinical care for people with asthma and ensuring they are aware of the latest clinical guidelines is essential.

## 5.8 Provide evidence and share knowledge that enables people to get the best out of the services that they use and help services to improve

This outcome was identified to assess wellbeing changes relating to people involved with SIGN guidelines, and this relates specifically to the HIS strategic priorities. Being involved in the development of the SIGN/BTS British guideline on the management of asthma raises awareness of the complexities of the condition, enhances personal development and learning, encourages sharing of knowledge and information and, crucially, leads to changes in clinician behaviour.

Feedback from HCPs on the GDG as well as feedback from HCPs completing the learning module based on SIGN 153, suggests HCPs have made changes to their clinical practice as a direct result of the guidelines.

## 6 Impact of guidelines on SIGN/HIS

### 6.1 Outcome 1 - SIGN/HIS have an increased understanding of what works and what is needed

Production of the asthma guideline followed a unique approach within SIGN, not least because it was the only UK-wide SIGN guideline. The unique nature of the guideline meant that members of the asthma GDG continued to carry out critical appraisal of the literature after this step was brought 'in-house' for other guidelines, and recommendations continued to be graded. This approach was strongly supported by the Steering Committee for SIGN 153 and was considered to be practical given the 'living' nature of the guideline. The different approach has, and will continue to, inform discussions within SIGN about its approach to guideline development and, more widely within SIGN and HIS, to discussions about approaches to clinical engagement.

### 6.2 Outcome 2 - SIGN/HIS are aware of how the guideline was received, eg positive/negative

The SIGN team within HIS reviews the implementation and impact of the guidelines by collecting data on the number of downloads of the guidelines, number of orders of patient booklets, copyright requests and publications which refer to the guidelines.

When looking at the 26 articles published after SIGN 153 was published, the SIGN team reviewed how the guideline was perceived in each of the published articles:

- 9 of the articles were positive or supportive (of the guideline)
- 1 was negative/critical
- 7 were mixed (positive and negative aspects), and
- 9 were neither positive nor negative.

It is helpful for SIGN and HIS to be aware of how the guidelines are perceived by those referring to them in their published work as this gives an indication of how the guidelines have been received by the wider clinical and scientific community.

### 6.3 Outcome 3 - SIGN/HIS update our processes and outputs to better support our stakeholders

The use of the contribution analysis framework, specific outcomes and indicators ensures that relevant data are collected on the outputs produced by SIGN. The data are used to analyse if the outputs contribute to the intended outcomes as shown in this report. Evaluation will help SIGN to update its processes and ensure the guideline development process and the published guidelines and patient booklets support stakeholders in the best way possible.

### 6.4 Outcome 4 - Make best use of all resources

This outcome was identified to assess wellbeing changes relating to SIGN/HIS and this relates specifically to the HIS strategic priorities.

The development of SIGN 153 involved 65 HCPs and it was recognised that the guideline development process could be made more efficient by amending it so as to allow a reduction in the number of HCPs involved. Careful selection of GDG members ensured the HCPs involved continued to represent the breadth of clinical knowledge and a wide geographical base, but reduced the resources needed at SIGN and BTS to support the process. In comparison with SIGN 153, SIGN 158 involved only 27 HCPs. Although this is still a large group by SIGN GDG standards, the UK-wide nature of the guideline and the breadth of its scope required a GDG of this size.

As described in *section 5*, the 27 HCPs spent a total of approximately 775 hours on the development of SIGN 158. This is a large time commitment from healthcare professionals, but essential to ensure all members' voices were heard and views presented in discussions relating to evidence and recommendations.

The following people at SIGN/HIS were involved for various durations and at various times over the 18 month development period for each guideline:

- SIGN programme manager (Band 7) – approximately 0.5 WTE throughout the process, including the planning and scoping stages
- HIS evidence and information scientists (Band 6 x2) - approximately 1.5 WTE at literature searching and reviewing stage, sporadic thereafter
- SIGN guideline co-ordinator (Band 4) – approximately 0.4 at literature searching stage, sporadic thereafter
- publications designer (Band 5) – publication stage only
- SIGN programme lead (Band 8b) – editorial stage only, and
- SIGN Council chair – editorial stage only.

No staff member worked solely on the guidelines and the biggest single input was from the SIGN programme manager.

At BTS, the chief executive and the deputy chief executive were involved in the guideline development, throughout the process, including the planning and scoping stages.

As described above, apart from the SIGN programme manager, SIGN staff members were only involved at specific stages of the process when their input was required, this meant they did not attend every meeting and their time was used effectively.

The reduction in the number of HCPs involved in SIGN 158, compared to SIGN 153, improved efficiency in recruiting new members, organising meetings, managing the critical appraisal of the literature and managing the individual GDG meetings. Fewer members meant less administrative work for the programme manager and guideline co-ordinator and much tighter control of the critical appraisal process as fewer people had to be contacted and chased for their feedback. Another benefit was that those undertaking the critical appraisal were the same as those involved in the considered judgement phase (rather than findings being handed over to others to review). This meant that they were familiar with the literature, which aided discussion and speeded up the process of drafting recommendations as there was less need to refer back to the original literature, or where this was required, relevant information was more easily found. There was no evidence that the reduced size of the GDG detracted from the quality of the finished guideline. Importantly, the reduced group size allowed SIGN 158 to be produced on time thus meeting the needs and expectations of stakeholders.

In November 2017, whilst SIGN 158 was in development, the National Institute for Health and Care Excellence (NICE) in England published a guideline on the diagnosis and management of chronic asthma (NG80), the first time that NICE had produced a guideline on this topic. It is likely that publication of the NICE guideline had an impact on the number of people accessing the SIGN/BTS guideline as the NICE guideline would have superseded the SIGN/BTS guideline in England and Wales. However, the impact of this has not yet been determined. That being said, the SIGN/BTS guideline had a much wider scope so sections of it not covered by the NICE guideline would still have been relevant in all parts of the UK. There was also a good deal of comparison of the two guidelines, for example in the medical literature, and that might actually have increased the number of people accessing the SIGN/BTS guideline or brought it to the attention of a wider audience.

The people involved in developing and disseminating the SIGN/BTS asthma guidelines have been very effective, with SIGN 153 and SIGN 158 in the top three most downloaded guidelines from the SIGN website. The total download numbers of approximately 290,000 for SIGN 153 and approximately 153,000 for SIGN 158, from the SIGN and BTS websites, shows the wide reach of the guidelines and reflects the fact that the guidelines have a UK-wide, rather than only a Scottish, audience.

## 7. Discussion and conclusions

The SIGN/BTS British guideline on the management of asthma has been a mainstay of the SIGN programme since work on the first edition began in 1999 and since the first edition was published in 2003. Over the years, many HCPs have given their time freely to the development of the guideline with both existing and new members involved in each update. This represents an extraordinary commitment from the clinical community, and a continuing willingness to be involved in and promote the guideline. Their commitment is reflected in the guideline's lasting legacy and its longevity, which in turn are a reflection of the success of the process of continually updating the guideline to ensure it remains clinically relevant and of the continuing interaction between SIGN, BTS and the clinical community between publication of each update, which in itself provides proof that the guideline is being actively used.

The collaboration between SIGN and BTS has ensured that the guideline development has involved HCPs from across the UK and that the published guidance is relevant to all countries of the UK. It has also provided links to clinical networks not accessible to SIGN and provided a national platform for discussion and dissemination of the guideline through its highly successful winter meetings.

Demand for the guideline is high, as evidenced by the number of downloads from the SIGN and BTS websites. The patient versions of the guidelines (the three patient booklets), coproduced with patients and patient representatives, are highly regarded and eagerly awaited as evidenced by the number of requests SIGN receives for copies of these from across the country and from many different organisations and individuals, and the fact that many orders are placed before the booklets are published.

The asthma guideline is much quoted and cited in published articles and journals and extracts are reproduced in textbooks and other teaching materials, thus it directly influences HCPs in training. The BNF includes text from the guideline.

Survey work undertaken by SIGN has shown that the guideline has a direct impact on many of the HCPs involved in its development, from providing an interesting learning opportunity to changing clinical practice and even clinical careers. For example, within the GDG, discussion of the draft recommendations was often extensive and involved reviewing the evidence tables and, not infrequently, the original papers on which they were based. These discussions also included consideration of the practicalities of implementing the recommendation/s and the need to balance aspirations with practicalities in order to improve care and management of people with asthma. The intense interaction between HCPs that takes place on the GDG are likely to result in changes in practice by enhancing knowledge of the work of other HCPs working with the same patient group. This may in turn improve monitoring of patients in primary care and the proportion of appropriate referrals to specialist services.

The high level of clinical involvement in the guideline development process is likely to be a major contributor to the guideline's success. The GDG ensures the draft guidelines are written as clearly as possible, and through invited comments and open consultation further improvements are made before the guidelines are published. However, the guidelines clearly cannot give answers as to what to do in every individual circumstance. This means that after publication of each update of the guideline, consultants, nurses, pharmacists and others contact SIGN and BTS looking for clarification of specific points. These requests for advice and guidance are evidence of the impact and use of the guideline in clinical settings. Guidelines are being used as a resource by healthcare professionals to enable them to provide the best evidence-based care they can. Issues raised after publication can directly affect the scope of the next update by describing real life situations requiring specific

guidance. It is good to know that healthcare professionals are using the guideline to inform or shape their clinical decisions as that precisely reflects its purpose.

In conclusion, the SIGN/BTS British guidelines on the management of asthma had a wide reach across the UK, with approximately 290,000 downloads of SIGN 153 (2016-2019) and approximately 153,000 downloads of SIGN 158 (2019-2020). Furthermore, more than 12,000 patient booklets were ordered by patient organisations, primary care and secondary care HCPs between 2016 and 2020.

By July 2020, a total of 44 copyright requests for the reproduction of figures and tables from the guideline were made and information from the guideline was highlighted in 31 published articles and a learning module used by 1,112 HCPs across the UK. Healthcare professionals reported on the impact of the guideline and how the awareness of the recommendations and information in the guideline resulted in changes in their clinical practice, improved knowledge of asthma diagnosis and treatment available for patients.

## 8. Acknowledgements

The authors wish to acknowledge the time, energy and enthusiasm of all the asthma GDG members without whom the guideline and this report would not have been possible. Special thanks are extended to those HCPs who completed the survey of GDG members', which provided unique insights into the role, benefits and drawbacks of GDG membership from a HCPs viewpoint, including information on dissemination and implementation activities, particularly relevant to this report and not available elsewhere. Thanks are extended, in particular, to the two co-Chairs of the GDG, John White and Jimmy Paton, whose tireless enthusiasm for and belief in the importance of the guideline have made the job of producing it so much easier.

Thanks are also extended to Sally Welham and Sheila Edwards at the British Thoracic Society who, as members of the GDG group and in their respective roles at BTS have given so much energy and enthusiasm to the asthma guideline since collaboration on the guideline first began over 20 years ago. The collaboration has allowed us to do things that would not otherwise have been possible. BTS have also provided information from their records that enhances this report and provides detail not otherwise available to SIGN.

Thanks are also extended to Gaynor Rattray, Euan Bremner, Domenico Romano, Kirsty Allan, Karen Graham and other staff at SIGN who have contributed some of the information used in this report and who have supported the guideline development process.

Finally, thanks to Megan Lanigan who developed the contribution analysis approach used in this report.



## 9. Glossary

AHP	Allied health professional
APPG	All Party Parliamentary Group
BNF	British National Formulary
BTS	British Thoracic Society
ERG	Evidence review group
GDG	Guideline development group
HCP	Healthcare professional
HIS	Healthcare Improvement Scotland
QRG	Quick reference guide
SIGN	Scottish Intercollegiate Guidelines Network

## Appendix A. Contribution analysis impact framework: outcomes for patients, carers and members of the public

<b>Theme</b>	<b>Outcome</b>	<b>Indicator</b>
Capacity change	<p>1. Patients, carers and the community are aware of guidelines/patient versions</p> <p>2. Patients and carers know what to expect regarding evidence-based care</p> <p>3. Patients and carers know where else they can go for support</p> <p>4. Patients and carers feel more informed in discussions with health and social care staff</p> <p>5. Awareness of SIGN and its role is raised</p>	<p><i>a. Number of requests from patients/voluntary organisations for guidelines (patient version, guideline and QRG)</i></p> <p><i>b. Number of lay people attending SIGN events</i></p> <p><i>c. Number of events SIGN awareness volunteers attend</i></p> <p><i>d. Number of lay people involved in the guideline development</i></p> <p><i>e. Number of new likes on Facebook and followers on Twitter</i></p> <p><i>f. Knowledge of evidence-based recommendations for treatment and care</i></p> <p><i>g. Direct communication from patients about the value of SIGN information</i></p> <p><i>h. Focus group analysis</i></p> <p><i>i. Requests for patient versions in different languages</i></p> <p><i>j. (NEW) Patient information section in the guideline</i></p> <p><i>k. Number of patients and carers who report feeling like they have more information before/during an appointment</i></p> <p><i>l. Number of patients and carers who report feeling like they have been involved in deciding about their care</i></p> <p><i>m. (NEW) GDG members survey</i></p> <p><i>n. Responses to consultation</i></p>
Behaviour change	<p>6. Patients and carers are better able to engage in discussing their care</p> <p>7. Patients and carers value being involved with SIGN and want to work with us</p>	<p><i>a. Number of downloads and distributed hard copies of patient versions</i></p> <p><i>b. Number of patients/carers reporting better engagement in discussions with healthcare practitioners</i></p> <p><i>c. Number of patients and carers involved in all parts of SIGN work</i></p> <p><i>d. Number of patients and carers expressing an interest in being involved in SIGN work</i></p> <p><i>e. Qualitative feedback from patient and carer reps about the value of working with SIGN</i></p>

Wellbeing change	8. Enable people to make informed decisions about their own care and treatment 9. Provide evidence and share knowledge that enables people to get the best out of the services that they use and help services to improve	
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(NEW) in the indicator description shows where additional indicators, specific to this guideline, were added

## Appendix B. Contribution analysis impact framework: outcomes for health and social care clinicians and boards

Theme	Outcome	Indicator
Capacity change	<p>1. Health and social care staff are aware of relevant guidelines/patient versions</p> <p>2. Health and social care staff understand the purpose of the guideline</p> <p>3. Awareness of SIGN and its role is raised</p>	<p><i>a. Number of Boards who systematically disseminate the guidance</i></p> <p><i>b. Number of guidelines, QRG and patient versions sent to health and social care settings and the number of settings they were sent to</i></p> <p><i>c. Number of guidelines and QRGs downloaded</i></p> <p><i>d. Number of new App users and volume of traffic</i></p> <p><i>e. Number of new likes on Facebook and followers on Twitter</i></p> <p><i>f. Number of health and social care staff involved in developing guideline/patient version</i></p> <p><i>g. Number of articles in trade press, peer-reviewed journals and general media</i></p> <p><i>h. Number of requests for clarification of or correction to guideline content</i></p> <p><i>i. Feedback at consultation stage</i></p> <p><i>j. Implementation of guideline</i></p> <p><i>k. Number of products distributed</i></p> <p><i>l. Number of copyright requests</i></p> <p><i>m. Increase in enquires to be on group</i></p> <p><i>n. Number of events awareness volunteers go to</i></p> <p><i>o. Responses to consultations</i></p>
Behaviour change	<p>4. Boards, team and departments use evidence-based guidance to review and update existing practice and policy</p> <p>5. Boards and clinicians value being involved with SIGN and want to work with us</p> <p>6. Health and social care staff use SIGN guidelines as part of shared decision making with patients and carers</p>	<p><i>a. Number of boards that have a process for dealing with guidelines</i></p> <p><i>b. Number of health and social care staff involved in all SIGN work</i></p> <p><i>c. Feedback in national meeting evaluation form indicating they want to work with SIGN and value working with SIGN</i></p> <p><i>d. Level of ease GG members report relating to getting time from Board to sit on the group</i></p> <p><i>e. Number of presentations (verbal and poster) at national and international conferences, evidencing use of SIGN guidance by health and social care staff</i></p> <p><i>f. Number of articles in peer-reviewed journals evidencing use of SIGN guidance by health and social care staff</i></p> <p><i>g. Number of copyright requests that indicate usage is for implementation, eg local policy</i></p> <p><i>h. Issues raised by non-GDG members</i></p>

	7. Health and social care staff feel reassured to know they are using the latest evidence to help their patients	<i>i. (NEW) BNF</i>
Wellbeing change	8. Provide evidence and share knowledge that enables people to get the best out of the services that they use and help services to improve	

*(NEW)* in the indicator description shows where additional indicators, specific to this guideline, were added

## Appendix C. Contribution analysis impact framework: outcomes for people involved with SIGN guidelines

Theme	Outcome	Indicator
Capacity change	<ol style="list-style-type: none"> <li>1. People acquire skills in interpreting and understanding evidence</li> <li>2. People have a greater understanding of evidence-based practice</li> <li>3. People improve their knowledge of the topic</li> <li>4. People are able to contribute to creating evidence-based recommendations</li> <li>5. Awareness of SIGN and its role is raised</li> </ol>	<ol style="list-style-type: none"> <li>a. Number of people who attend training on critical appraisal</li> <li>b. Training for public partners on guideline groups and for writing the patient version (SIGN writing group)</li> <li>c. GDG member attending group meetings</li> <li>d. (NEW) GDG members' survey</li> <li>e. GDG members read the evidence table and papers</li> <li>f. GDG members draft considered judgement</li> </ol>
Behaviour change	<ol style="list-style-type: none"> <li>6. People use their knowledge of interpreting evidence to inform their work/contribution and to maintain published guideline</li> <li>7. People are topic champions and encourage change in their area of interest</li> </ol>	<ol style="list-style-type: none"> <li>a. Self-reported feedback at end of guideline of impact of their knowledge of interpreting evidence on their own work</li> <li>b. Number of times a GDG member alerts SIGN to updates in the evidence that impact on the guideline</li> <li>c. Number of GDG members who report written or verbal presentations they have completed (and the number of these presentations) on the guideline topic (eg, from GDG members' survey)</li> <li>d. Number of GDG members who report new roles of influence in the topic area</li> <li>e. Number of reported changes GDG members have seen as a result of their knowledge of the topic/SIGN guideline</li> </ol>
Wellbeing change	<ol style="list-style-type: none"> <li>8. Provide evidence and share knowledge that enables people to get the best out of the services that they use and help services to improve</li> </ol>	

## Appendix D. Contribution analysis impact framework: outcomes for SIGN/HIS

Theme	Outcome	Indicator
Capacity change	<ol style="list-style-type: none"> <li>1. SIGN/HIS have an increased understanding of what works and what is needed</li> <li>2. SIGN/HIS are aware of how the guideline was received, eg positive/negative</li> </ol>	
Behaviour change	<ol style="list-style-type: none"> <li>3. SIGN/HIS update our processes and outputs to better support our stakeholders</li> </ol>	
Wellbeing change	<ol style="list-style-type: none"> <li>4. Make best use of all resources</li> </ol>	

## Appendix E. SIGN 153 and SIGN 158 orders received by SIGN

Guideline, QRG and patient booklets orders by healthcare professionals, patient/carers, and other (non-NHS) organisations, showing number of items ordered

Ordered by	Product	SIGN 153		SIGN 158*	
		Orders	Number	Orders	Number
HCP	Guideline	18	29	6	12
	QRG	145	716	51	333
	Patient booklets	278	5,566	179	6,382
Patient	Guideline	3	3	1	1
	QRG	1	10	4	7
	Patient booklets	6	63	1	1
Other	Guideline	3	19	1	1
	QRG	2	30	0	0
	Patient booklets	9	68	4	40
<b>Totals</b>		<b>465</b>	<b>6,504</b>	<b>247</b>	<b>6,777</b>

\* Figures correct as at 31 July 2020.



## Appendix F. SIGN website guideline download numbers

From June 2017–November 2017, the SIGN 153 QRG was downloaded 16,185 times from the SIGN website. No further data were available on QRG downloads from the SIGN website.

### *SIGN 153 Download data SIGN website (June 2017–January 2018)*

Date	Downloads
June–August 2017	2,533
September 2017	3,923
October 2017	4,998
November 2017	4,952
December 2017	861
January 2018	1,940
<b>Total</b>	<b>19,207</b>
<b>Average</b>	<b>2,401</b>

### *SIGN 153 Download data SIGN website (January 2019–July 2019)*

Date	Downloads
January 2019	1,128
February 2019	1,307
March 2019	1,637
April 2019	3,487
May 2019	2,486
June 2019	1,928
July 2019	1,695
<b>Total</b>	<b>13,668</b>
<b>Average</b>	<b>1,953</b>

The total downloads for SIGN 153 was estimated as 76,000. This was calculated by using the average download number of 2,401 to estimate the download number for September 2016–May 2017 as 21,609; adding the actual number for June 2017–January 2018 of 19,207; by using the average download number of 1,953 to estimate the download number for February 2018–December 2018 as 21,483; and adding the actual number of 13,668 for January 2019–July 2019.

### *SIGN 158 Download data SIGN website (July 2019–January 2020)*

Date	Downloads
23–30 July 2019	887
August 2019	1,419
September 2019	2,388
October 2019	3,993
November 2019	3,466
December 2019	2,512
January 2020	3,018
<b>Total</b>	<b>17,683</b>
<b>Average</b>	<b>2,829</b>

An estimate of 16,974 for February 2020–July 2020 was calculated using the average of 2,829. Therefore, the estimated total downloads for SIGN 153 is 34,500 for July 2019 to July 2020.

## Appendix G. Issues and queries raised in relation to the SIGN/BTS asthma guidelines

Impact categories used by SIGN for issues raised relating to the guidelines were:

- 1) clinical staff using guideline in day-to-day practice querying practicalities of implementation
- 2) supporting provision of advice by others
- 3) HCP requesting additional advice or clarification of care/treatment approaches
- 4) stimulating clinical debate on best practice
- 5) patient/carer/lay request for information or change, and
- 6) other.

The 'outcome' was either that the issue was resolved and no change was necessary to the guideline, or that the issue was taken forward for consideration during the next update of the guideline.

*Outcome by impact category for issues raised by HCPs following publication of SIGN 153*

Outcome	Impact category					Total
	1	2	3	4	5	
No change	4	1	5	3	0	14
Update	2	5	7	6	1	20
<b>Total</b>	<b>6</b>	<b>6</b>	<b>12</b>	<b>9</b>	<b>1</b>	<b>34</b>

*Impact category by type of enquirer for SIGN 153*

Enquirer	Impact category					Total
	1	2	3	4	5	
Medical	2	1	1	7	0	11
Nursing	0	0	1	0	0	1
Pharmacist	4	2	6	0	0	12
Commercial	0	0	0	2	0	2
Other	0	3	3	0	1	7
Not known	0	0	1	0	0	1
<b>Total</b>	<b>6</b>	<b>6</b>	<b>12</b>	<b>9</b>	<b>1</b>	<b>34</b>

For SIGN 158, for three of the issues raised (two by pharmaceutical companies and the one from the pharmacist) the outcome is that a minor update will be required to the guideline and the remaining two required no change to the guideline. One of these issues was classed as impact category '1', one as category '4' and 3 as category '6'

## Appendix H. Copyright requests for SIGN 153 and SIGN 158

Type of request	Number of requests		% approved	
	SIGN 153	SIGN 158	SIGN 153	SIGN 158
Book chapter	5	5	60	100
Published article	10	7	80	86
Local NHS use	3	0	100	n/a
Pharmaceutical company	8	3	25	100
Teaching/training/COD	0	3	n/a	100
<b>Total</b>	26	18		

For SIGN 153, permission was most often requested to reproduce the following three figures 'Summary of management in children' (11 requests), 'Summary of management in adults' (10 requests), 'Diagnostic algorithm' (seven requests). These figures along with the tables on 'Categorisation of inhaled corticosteroids by dose' in adults and children, were also available on the SIGN website as standalone documents. This made them easily accessible, for example to HCPs wishing to produce laminated copies for display in wards and emergency departments (SIGN staff have seen these figures and tables used in this way). This may have reduced the number of copyright requests from NHS staff for this type of reproduction.

For SIGN 158, permission was most often requested to reproduce the figures 'Summary of management in adults' (nine requests), and 'Diagnostic algorithm' (three requests). These figures and the tables 'Categorisation of inhaled corticosteroids by dose' in adults and children, were also available on the SIGN website as standalone documents and this may have reduced the number of copyright requests from NHS staff for this type of reproduction.