## PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (**http://bmjopen.bmj.com/site/about/resources/checklist.pdf**) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

## ARTICLE DETAILS

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| **TITLE (PROVISIONAL)** | The Severe Asthma Toolkit: An Online Resource for Multidisciplinary Health Professionals – Needs Assessment, Development Process and User Analytics with Survey Feedback |
| **AUTHORS** | Maltby, Steven; Gibson, Peter; Reddel, Helen; Smith, Lorraine; Wark, Peter; King, Gregory; Upham, John; Clark, Vanessa; Hew, Mark; Owens, Louisa; Oo, Stephen; James, Alan; Thompson, Bruce; Marks, Guy; McDonald, Vanessa |

## VERSION 1 – REVIEW

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| **REVIEWER** | Melanie Barwick<br>The Hospital for Sick Children, Canada |
| **REVIEW RETURNED** | 22-Jul-2019 |

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| **GENERAL COMMENTS** | Thank you for the opportunity to review this paper. The manuscript describes the development and evaluation of a web resources or toolkit for clinicians working in severe asthma. The authors make a good case for the need to focus specifically on severe asthma, as other resources exist for mild and moderate asthma and are typically tailored and directed to patients rather than clinicians.<br><br>The authors also argue that "specific educational and clinical resources for severe asthma are required for health professionals, in particular to educational resources to up-skill multidisciplinary clinicians and to support management where specialist care is limited (e.g. rural and remote regions)". This is where the paper gets into murky waters as it implies that the developed and disseminated web-based educational toolkit directed at clinicians will effectively 'upskill' or support the implementation of evidence-based care for severe asthma. At issue is that dissemination is only part of what is required for implementation of new evidence based interventions. It isn't clear that the authors appreciate this distinction; "… to our knowledge, no dedicated educational and training websites exist to inform the clinical management of severe asthma." "We proposed that a web-based resource designed for clinicians to inform the management of severe asthma was required. We developed the Severe Asthma Toolkit website to address this unmet need: - please clarify what you mean as 'unmet need'.<br><br>Relatedly, the project scoping section on page 6 also suggests that the toolkit was a way of providing training; this is problematic. It would be important to clarify the KT goal of the web-based toolkit; think of which of these goals were intended - to build awareness, knowledge, to support decision-making, facilitate practice change, etc. See http://melaniebarwick.com/insights-on-kt-purpose-and-quality-know-your-why/. Once you have clearly articulated your KT |

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| | goal(s) you can identify how your metrics map to your goals. For instance, 'hits' are a measure of reach and an indicator of awareness.<br><br>In the results section, the authors report that web-based tools were deemed to be 'most useful' – one wonders, useful for what exactly? One presumes the goal is to build knowledge, given the discussion, but this should be explicitly stated earlier on.<br>With respect to user analytics, can you report on the number of repeat visitors?<br><br>In reporting that "the majority of survey respondents indicated that the Toolkit increased their knowledge and confidence in delivering severe asthma management to patients. Importantly, three quarters of survey respondents indicated they will use the resource in the clinic" could you clarify how they might use the resource in the clinic? Is this what you mean by clinical utility? I'm not sure this was, in fact, demonstrated.<br><br>Given the cost of developing the site, can you comment on how it will feasibly be maintained?<br><br>Please expand on this declaration – "The Toolkit has been successful" by specifying how; successful for…? From 23 March 2018 to 03 July 2019, 18,474 total users accessed the website (25,397 sessions; 66,394 page-views); if you can defend why this can be interpreted as extensively accessed you will strengthen your paper. Consider that some authorities do not consider that the number of web visits is a good measure of success. For instance, see https://www.a1webstats.com/resource/what-is-a-good-number-of-website-visitors-per-month/ "While there can sometimes be correlation between visitor numbers and actual business gained, it's worth comparing these two hypothetical examples:<br>1. A business selling widgets has strong website traffic (2000 visitors per month) but both their marketing activities and website itself have weaknesses within them. The end result is that they gain 20 enquiries from their 2000 website visitors (1%).<br>2. Another business selling the same widgets has relatively low website traffic (500 visitors per month) but their website and marketing focus are much stronger. The end result is that they gain 20 enquiries from their 500 website visitors (4%).<br>In the examples above, the end result was the same – 20 enquiries each. The difference was that the website with the lower website visitor numbers had a stronger proposition/marketing and so benefited more from a lower number of website visitors.<br><br>I did not see a hyperlink or URL for the Toolkit; consider adding this.<br><br>Was ethical approval needed and was it provided?<br><br>It would be useful to append your user survey in an additional file. |

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| **REVIEWER** | Dr Duncan Keeley<br>General Practitioner<br>Thame OX9 3JF |
| **REVIEW RETURNED** | 06-Nov-2019 |

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| **GENERAL COMMENTS** | This article describes the process of production of an online resource for severe asthma in Australia and provides some initial |

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| | user analytics and a user questionnaire ( 371 responses ) assessing user responses to the website and its usefulness.<br><br>The resources was primarily designed for and used by health professionals but there was some involvement of and use by patients/service users.<br><br>This is innovative and valuable development and the account of its development is of interest to the general reader.<br><br>A basic analysis of the costs of development is given but significant elements of the development costs are not detailed and it might be better to provide further details of those costs, and also to provide some estimate of the ongoing maintenance costs of the resource and how these costs have been and will be met.<br><br>I assume, since this is not described , that the website does not have facilities for a question and answer service or moderated discussions for users. It may be worth clarifying this point and discussing the thinking behind any decisions made on user interactivity. Decisions on what not to do or to attempt with a web resource of this kind can also be of interest to those thinking of developing similar resources.<br><br>Analytics on traffic to the website are presented but it is not easy for a reader not steeped in website analytics to contextualise these figures . It might be possible to give comparative figures to some analogous resource for health professionals.<br><br>Numerical figures on usage are given but it may be possible to provide some narrative anecdotes of comments and feedback to add colour. Is ti possible ti give any flavour of the response of patients as opposed to health professionals as to their views on the site. It can be challenging to meet the needs of both patients and health professionals . Has there been any formal feedback from patient organisations ?<br><br>How does the site use or interact with social media? Is any time and resource devoted to this ?<br><br>Conflict of interest declarations have been made for the article. How does the site itself handle conflict of interest declarations?<br><br>These are minor suggestions that might enhance the paper but I would not regard them as necessary for publication.<br><br>The paper is well written and easy to read. References seem adequate and up to date.<br><br>End of review. |

**VERSION 1 – AUTHOR RESPONSE**

Reviewers' Comments to Author:
Reviewer: 1
Reviewer Name: Melanie Barwick

Institution and Country: The Hospital for Sick Children, Canada
Please state any competing interests or state 'None declared': None declared.

Thank you for the opportunity to review this paper. The manuscript describes the development and evaluation of a web resources or toolkit for clinicians working in severe asthma. The authors make a good case for the need to focus specifically on severe asthma, as other resources exist for mild and moderate asthma and are typically tailored and directed to patients rather than clinicians.

We thank reviewer Dr Melanie Barwick for her detailed and thoughtful feedback. We appreciate your time and consideration and have made efforts to address all suggestions to improve the quality of the revised manuscript.

The authors also argue that "specific educational and clinical resources for severe asthma are required for health professionals, in particular to educational resources to up-skill multidisciplinary clinicians and to support management where specialist care is limited (e.g. rural and remote regions)". This is where the paper gets into murky waters as it implies that the developed and disseminated web-based educational toolkit directed at clinicians will effectively 'upskill' or support the implementation of evidence-based care for severe asthma. At issue is that dissemination is only part of what is required for implementation of new evidence-based interventions. It isn't clear that the authors appreciate this distinction; "… to our knowledge, no dedicated educational and training websites exist to inform the clinical management of severe asthma." "We proposed that a web-based resource designed for clinicians to inform the management of severe asthma was required. We developed the Severe Asthma Toolkit website to address this unmet need: - please clarify what you mean as 'unmet need'.

We have updated the revised manuscript to acknowledge that the development of the Severe Asthma Toolkit is only one aspect of the required implementation approach necessary to support healthcare professional training to improve patient outcomes (pg. 18). We have now noted the need for further study to assess effects of the resource on clinical practice or patient outcomes (pg. 18). We have also emphasised the need for concerted efforts by all stakeholders to implement evidence and resources to improve clinical practice and ultimately patient outcomes (pg. 19).

The following text edits have now been included in the revised manuscript:
"While these data are promising, we do recognise that dissemination is only part of the translation process to bring about clinical practice change and improve patient outcomes. Further assessment will be required to determine whether this resource has effects on these outcomes." (pg. 18)

"We note that the development of the Severe Asthma Toolkit is only one aspect of the required implementation approach necessary to support healthcare professional awareness and training for severe asthma. A concerted effort is now required by all stakeholders to implement existing evidence and resources (including the Severe Asthma Toolkit) to improve clinical practice and provide optimal care for people with severe asthma." (pg. 19)

Relatedly, the project scoping section on page 6 also suggests that the toolkit was a way of providing training; this is problematic. It would be important to clarify the KT goal of the web-based toolkit; think of which of these goals were intended - to build awareness, knowledge, to support decision-making, facilitate practice change, etc. See http://melaniebarwick.com/insights-on-kt-purpose-and-quality-know-your-why/. Once you have clearly articulated your KT goal(s) you can identify how your metrics map to your goals. For instance, 'hits' are a measure of reach and an indicator of awareness.

We have revised the manuscript to clarify the goals of this project, namely to increase awareness of severe asthma, provide access to evidence-based resources and to support decision-making for

effective practice changes. These points have now been raised in the abstract and throughout the manuscript. As noted above, we have also highlighted that the Severe Asthma Toolkit is but one aspect of the necessary implementation approach required to support clinical practice change.

In the results section, the authors report that web-based tools were deemed to be 'most useful' – one wonders, useful for what exactly? One presumes the goal is to build knowledge, given the discussion, but this should be explicitly stated earlier on.

This data is presented based on survey responses from a 2017 TSANZ Annual Meeting workshop, held in Canberra. Specifically, respondents (who were primarily healthcare professionals) were asked "Do you think there is a need for a new resource dedicated to severe asthma" and "What formats would be useful to you?" This text has now been included in the revised manuscript (pg. 9).

We agree with the reviewer that this preference likely reflects the respondent's goals of building knowledge, but we did not include further questions in the questionnaire to provide insights into the deeper meaning.

With respect to user analytics, can you report on the number of repeat visitors?

We have added the number of repeat users (4,182), where the proportion of returning visitors (13%) is mentioned (pg. 13). This value is similar to the number of survey respondents reporting they had visited several times (13%) or regularly visit (3%), as reported on page 13.

In reporting that "the majority of survey respondents indicated that the Toolkit increased their knowledge and confidence in delivering severe asthma management to patients. Importantly, three quarters of survey respondents indicated they will use the resource in the clinic" could you clarify how they might use the resource in the clinic? Is this what you mean by clinical utility? I'm not sure this was, in fact, demonstrated.

This data is reported based on the specific survey question by respondent self-report (Supplementary Table 1). We have revised the language relating to "clinical utility" to reflect this context (pg. 16).

We have also included additional text, to comment on aspects of the resource that may be useful in the clinic:
"The utility and flexibility of this format is highlighted by users accessing content using a range of devices and from countries around the world, as well as survey respondents self-reporting that they would use the toolkit as a resource in clinic (75%). Accordingly, the website is an accessible resource that provides both educational and clinical utility through point-of-care access to patient assessment tools, clinical guidelines and educational resources."

Given the cost of developing the site, can you comment on how it will feasibly be maintained?

We have expanded the discussion on potential additional costs for both basic maintenance and more extensive updates and extensions of the existing resource (pg. 17/18):
"Basic ongoing maintenance of the website (e.g. domain registration, web hosting servers and basic software updates) are anticipated to be quite minimal ($1 – 2,000 AUD / year), albeit dependent on existing staff or volunteer contributions. Development of additional resources and extensive updates will be dependent on support from specific funding (e.g. educational grants) or infrastructure funding."

Please expand on this declaration – "The Toolkit has been successful" by specifying how; successful for…? From 23 March 2018 to 03 July 2019, 18,474 total users accessed the website (25,397 sessions; 66,394 page-views); if you can defend why this can be interpreted as extensively accessed

you will strengthen your paper. Consider that some authorities do not consider that the number of web visits is a good measure of success. For instance, see https://www.a1webstats.com/resource/what-is-a-good-number-of-website-visitors-per-month/ “While there can sometimes be correlation between visitor numbers and actual business gained, it’s worth comparing these two hypothetical examples:
1. A business selling widgets has strong website traffic (2000 visitors per month) but both their marketing activities and website itself have weaknesses within them. The end result is that they gain 20 enquiries from their 2000 website visitors (1%).
2. Another business selling the same widgets has relatively low website traffic (500 visitors per month) but their website and marketing focus are much stronger. The end result is that they gain 20 enquiries from their 500 website visitors (4%).
In the examples above, the end result was the same – 20 enquiries each. The difference was that the website with the lower website visitor numbers had a stronger proposition/marketing and so benefited more from a lower number of website visitors.

We have added additional text to clarify the description of “successful” in the Discussion (pg. 19). As articulated in the revised manuscript, our goal was to develop a resource that would be accessed by healthcare professionals, to increase awareness of severe asthma, which would increase knowledge and be used in the clinic. Our data demonstrate that the resource has succeeded in these goals, with broad uptake (across 169 countries worldwide) by our intended user group (72% based on user surveys). By user self-report, the resource has improved their knowledge (73%) and confidence (66%) in severe asthma management and is likely to be used in clinic (75%).

The revised manuscript text includes:
“In terms of the goals of development, we believe that the Toolkit has been successful. These aspects included promoting awareness of severe asthma, increasing knowledge (73% of respondents) and confidence (66%) in severe asthma management and providing a resource that clinicians say they will access while in the clinics seeing patients (75%). It has been extensively accessed by health professionals engaged in severe asthma (72% of respondents) worldwide in 169 different countries. While these data are promising, we do recognise that dissemination is only part of the translation process to bring about clinical practice change and improve patient outcomes. Further assessment will be required to determine whether this resource has effects on these outcomes.”

For context, we also note that the total membership of the Thoracic Society of Australia & New Zealand (the peak professional respiratory group in these countries) is approximately 1,700 members. Thus, we propose that the Severe Asthma Toolkit being accessed by over 32,000 users (of which 72% self-report as healthcare professionals) represents significant coverage of our intended user group. This context has been included in the discussion (pg. 16).

I did not see a hyperlink or URL for the Toolkit; consider adding this.

Hyperlinks to cached versions of the Toolkit are included in the manuscript references (ref #19 & 20). The URL is also included in the Abstract (pg. 2). We have now added a hyperlink for the Severe Asthma Toolkit to the first mention in the manuscript text (pg. 5)

Was ethical approval needed and was it provided?

Ethical approval was sought, and received, for the user feedback survey as described on page 9: “A pop-up user feedback survey was integrated into the website with approval from the Hunter New England Human Research Ethics committee (AU201805-12).”

It would be useful to append your user survey in an additional file.

As requested, the user feedback survey questions and responses are now included in the supplementary materials (Supplementary Table 1).

Reviewer: 2
Reviewer Name: Dr Duncan Keeley
Institution and Country: General Practitioner, Thame OX9 3JF, UK
Please state any competing interests or state 'None declared': None declared

This article describes the process of production of an online resource for severe asthma in Australia and provides some initial user analytics and a user questionnaire (371 responses) assessing user responses to the website and its usefulness.

The resources was primarily designed for and used by health professionals but there was some involvement of and use by patients/service users.

This is innovative and valuable development and the account of its development is of interest to the general reader.

We thank reviewer Dr Duncan Keeley for his positive assessment of both the Severe Asthma Toolkit resource and the current manuscript describing its development and usage. We thank reviewer Dr Duncan Keeley for his detailed and thoughtful feedback. We appreciate your time and consideration and have made efforts to address all suggestions to improve the quality of the revised manuscript.

A basic analysis of the costs of development is given but significant elements of the development costs are not detailed and it might be better to provide further details of those costs, and also to provide some estimate of the ongoing maintenance costs of the resource and how these costs have been and will be met.

We have added content in the discussion to expand on potential additional costs for basic maintenance and more extensive updates and extensions of the existing resource (pg. 17):
"Much of these expenses were covered by existing Centre of Excellence in Severe Asthma activities, which is supported by NHMRC Centres of Research Excellence grant funding from 2014 – 2019. Centre of Excellence funding also supported social media activity (Twitter @SevereAsthmaCRE), which was used to increase awareness of the Severe Asthma Toolkit and its resources. All contributors provided written content and review pro bono. Development of this resource would not have been possible without their contributions. We do note that additional features were considered and not included in the resource, due to budgetary constraints (e.g. functional online forums with question-and-answer capacity, which would have required dedicated ongoing staffing). Basic ongoing maintenance of the website (e.g. domain registration, web hosting servers and basic software updates) are anticipated to be quite minimal ($1 – 2,000 AUD / year), albeit dependent on existing staff or volunteer contributions. Development of additional resources and extensive updates will be dependent on support from specific funding (e.g. educational grants) or infrastructure funding."

I assume, since this is not described, that the website does not have facilities for a question and answer service or moderated discussions for users. It may be worth clarifying this point and discussing the thinking behind any decisions made on user interactivity. Decisions on what not to do or to attempt with a web resource of this kind can also be of interest to those thinking of developing similar resources.

The reviewer's statement is correct. We did not build online forum / question and answer functionality into the Severe Asthma Toolkit website. We have added additional text providing the reasoning behind this decision, where we discuss the development and maintenance budget (pg. 17): "We do

note that some potential features were considered and not included in the resource, due to budgetary constraints (e.g. functional online forums with question-and-answer capacity, which would have required dedicated ongoing staffing)".

Analytics on traffic to the website are presented but it is not easy for a reader not steeped in website analytics to contextualise these figures. It might be possible to give comparative figures to some analogous resource for health professionals.

We present user analytics data to provide insights into the resource usage. We appreciate the reviewer's point that it is difficult to put this data into specific context. It is difficult to access analytics for other resources or to identify a similar resource to provide context. In particular, as our target audience was healthcare professionals, we felt it would not be useful to compare metrics to consumer / public-targeted websites.

We believe that the user feedback survey data is highly relevant in this discussion, as it indicates that the website is accessed by our target audience (namely healthcare professionals = 72% of users to date; pg. 13). For context, we note that the total membership of the Thoracic Society of Australia & New Zealand (the peak professional respiratory group in these countries) is approximately 1,700 members. Thus, we propose that the Severe Asthma Toolkit being accessed by over 32,000 users (of which 72% self-report as healthcare professionals) represents significant coverage of our intended user group. This context has now been included in the discussion (pg. 16):
"For context, we note that the total membership of the Thoracic Society of Australia & New Zealand (the peak professional respiratory body in these countries) is approximately 1,700 total members. Thus, we propose that over 32,000 total users accessing the Severe Asthma Toolkit represents significant usage, based on the intended target audience."

Numerical figures on usage are given but it may be possible to provide some narrative anecdotes of comments and feedback to add colour. Is it possible to give any flavour of the response of patients as opposed to health professionals as to their views on the site? It can be challenging to meet the needs of both patients and health professionals. Has there been any formal feedback from patient organisations?

The intended audience for this resource is healthcare professionals, as other resources have been developed for the patient audience (e.g. Asthma Australia and Asthma UK websites). We have also noted the recently launched Severe Asthma HealthTalk Australia website, which was developed by Centre of Excellence in Severe Asthma investigators (https://healthtalkaustralia.org/severe-asthma/overview/).

Efforts were made to limit the use of technical language and make the resource as broadly useful as possible and patient representatives were included in the Reference Group (pg. 6). Further formal feedback was not sought from patient organisations, but this could be an area for further development.

This point has now been noted in the revised discussion (pg. 16/17):
"This could include modules targeted specifically for a consumer / patient audience, with collaborative input from relevant stakeholder organisations. We note that a HealthTalk Australia Severe Asthma website (https://healthtalkaustralia.org/severe-asthma/overview/) was recently launched by Centre of Excellence in Severe Asthma Investigators which presents interviews of people living with severe asthma for a public audience."

How does the site use or interact with social media? Is any time and resource devoted to this?

The Centre of Excellence in Severe Asthma maintains a Twitter feed (@SevereAsthmaCRE), which is managed by centre staff. This feed has been used to promote awareness of the resource. This has now been noted in the discussion (pg. 17): “Centre of Excellence funding also supported social media activity (Twitter @SevereAsthmaCRE), which was used to increase awareness of the Severe Asthma Toolkit and its resources.”

Conflict of interest declarations have been made for the article. How does the site itself handle conflict of interest declarations?

Conflict of interest statements were not collected. All contributors provided content pro bono and have been listed on the website (https://toolkit.severeasthma.org.au/contributors/). No contributors are employees of the pharmaceutical industry.

These are minor suggestions that might enhance the paper but I would not regard them as necessary for publication.

The paper is well written and easy to read. References seem adequate and up to date.

**VERSION 2 – REVIEW**

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| **REVIEWER** | Melanie Barwick<br>The Hospital for Sick Children / University of Toronto, Canada |
| **REVIEW RETURNED** | 29-Dec-2019 |

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| **GENERAL COMMENTS** | Thank you for addressing my earlier comments. I can see that the paper is improved. There remain some issues I think could be quickly addressed, and in particular, attention to language so as not to over-promote your findings and to place them in better perspective.<br><br>I have made comments directly on your manuscript using track changes. These are also listed below:<br><br>1) page 4/5: Furthermore, much of the clinical education available relating to asthma focuses on mild-to-moderate disease, and this knowledge and training is often extrapolated and applied to patients with severe disease - Can you add a bit here on why this is problematic/unhelpful. You need a supporting fact/evidence statement for this proposition, particularly since it provides the context for the resource you developed.<br>2) page 10 - Data relating to a needs assessment survey, user analytics and user feedback surveys are included below. No additional data ARE available from this study.<br>3) page 13 - pre-launch user feedback. Could you show this data; without it, the reader must rely on your say-so. What did they say, exactly?<br>4) page 14 - Toolkit Launch & Usage Metrics - Users accessed the site via organic searches (e.g. Google; 69%), direct links (20%), referral from other sites (9%), and social media (e.g. Twitter; 2%). Room for improvement here to increase/rebalance source sites; see https://www.kaushik.net/avinash/beginners-guide-web-data-analysis-ten-steps-tips-best-practices/ Also,I think you should report other user stats; for instance, how many repeat users you had so far. This indicates how attached users are to the site (repeat visitors) vs ‘one night stands’. This will give you a baseline for |

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| | improvement over time, and tell you where you need to do some work.<br>5) page 14 - Post-Launch User Feedback<br>During the period between 23 March 2018 – 21 November 2019, 394 website visitors completed the on-site user feedback survey. This is a v small percengtage of visitors and should be noted as a limitation of the findings. (0.01%) and dictate caution on stating the site is 'successful'. I'd say, 'promising' but some additional work is need to improve dissemination.<br>6) page 16 - The value of this resource has been reinforced by the enthustiastic uptake and dissemination by stakeholder organisations to their respective health care professional networks (e.g. Asthma Australia, TSANZ, National Asthma Council, Lung Foundation of Australia) and official recognition of the website as a TSANZ-endorsed training resource.I don't believe this is mentioned earlier. Please describe how these 'champion' organizations took up and linked to the resource. Can you provide concrete description of how many organizations linked to your site and whether they were drivers of site visits? You state that referral from other sites was 9%; how does that compare to other data? What is the potential reach of audience via these organiations; what is their membership size? How are you able to categorize this as 'enthusiastic'?<br>7) page 16 - New management approaches for severe asthma require access to healthcare resources. While new targeted therapy options are available that provide a personalised approach for patients, effective use of these treatments requires detailed phenotyping of clinical and immunological domains 11. Multidimensional assessment and management of co-morbidities reduce exacerbations and improve asthma control and asthma-related quality of life 24. These approaches require recognition of comorbidities, access to multidisciplinary allied health professionals and effective coordination of care. Dedicated asthma services also improve healthcare use and patient outcomes 25. However, establishment of a severe asthma clinic is complex. The Severe Asthma Toolkit provides content to support users in each of these issues, with evidence-based practical recommendations (e.g. modules on "Asthma Phenotypes", "Phenotyping", "Multidimensional Assessment" and "Establishing a Clinic") and infographics (accessible at https://toolkit.severeasthma.org.au/resources/infographics/).This paragraph is redundant with what you have covered earlier re: purpose/need.<br>8) page 16 - The result is an online resource that is easy to navigate... How do you know this?<br>9) page 17 - User analytics data SUGGEST - no s (singular, as data is plural)<br>10) page 17 - Thus, we propose that over 32,000 total users accessing the Severe Asthma Toolkit represents significant usage, based on the intended target audience. A click is not indicative of 'usage'. What you have demonstrated is that 32,000 clicked on your webpage. That's a start, to be sure, as in, they found it and now know it's there. Usage, however, is another thing entirely. Did it inform their practice? How? Who is coming back/loyal? etc. needs to be uncovered/described in greater detail.<br>11) page 19 - In terms of the goals of development, we believe that the Toolkit has been successful. I would soften this statement to say the site shows potential, given the small % of survey respondents.<br>12) page 19 - It has been extensively accessed by health professionals engaged in severe asthma (72% of respondents) worldwide in 169 different countries. How will you improve source |

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| | referrals; need to say something about this. You can't just rely on Google/search engines. You need referring sites, but say little about how you worked on this or how you will work on this moving forward. You should aim for 20% to 30% Referring Sites. A healthy web strategy includes a robust amount of traffic from other sites that link to your products and services, and praise (or slam!) you, or promote you on Twitter and Facebook and forums and otherwise link to you. Free traffic (usually) and you do want that (for many reasons).<br>13) page 19 - . Further assessment will be required to determine whether this resource has effects on these outcomes. Agreed, but the phrasing is a bit naïve in light of implementation science evidence that details quite well now what is need to change practice, over and above exposure to resources. Careful here.<br>14) page 19 - The broad expertise of contributors and active engagement with health professionals, stakeholders and consumers throughout this process were critical to DEVELOPMENT OF THIS WEBSITE; instead of 'this success'.<br>14) page 20 - The website has been extensively accessed by users worldwide. I'm not comfortable with this qualifier. Based on 32,169 total users accessed the website (42,454 sessions; 99,369 page-views) from 169 different countries<br>Some work needed here to help with interpretation; this was a comment from the other reviewer, by the way. See: https://www.kaushik.net/avinash/beginners-guide-web-data-analysis-ten-steps-tips-best-practices/<br>Generally, I think you've demonstrated how you developed a unique and needed resource. Now, you need to improve your dissemination so that you develop wider exposure and repeat /loyal visitors. |

**VERSION 2 – AUTHOR RESPONSE**

Reviewer: 1

Reviewer Name: Melanie Barwick

Institution and Country: The Hospital for Sick Children / University of Toronto, Canada

Please state any competing interests or state 'None declared': I have no competing interests to declare.

Thank you for addressing my earlier comments. I can see that the paper is improved. There remain some issues I think could be quickly addressed, and in particular, attention to language so as not to over-promote your findings and to place them in better perspective.

We thank reviewer Dr. Melanie Barwick for her specific and detailed additional feedback on our manuscript. We have adjusted the text based on the tracked change document provided. Further, we have addressed the points below and in the revised manuscript and feel that the input has strengthened the manuscript.

I have made comments directly on your manuscript using track changes. These are also listed below:

1) page 4/5: Furthermore, much of the clinical education available relating to asthma focuses on mild-to-moderate disease, and this knowledge and training is often extrapolated and applied to patients with severe disease - Can you add a bit here on why this is problematic/unhelpful. You need a supporting fact/evidence statement for this proposition, particularly since it provides the context for the resource you developed.

We have provided an example to support this statement, as suggested (pg. 5):

“For example, a step-wise escalation of anti-inflammatory corticosteroid treatment which is appropriate for mild-to-moderate disease. This is inappropriate for severe asthma, which responds differently to treatment, impacts patients in different ways and requires a different approach to management (e.g. targeted add-on therapy).”

2) page 10 - Data relating to a needs assessment survey, user analytics and user feedback surveys are included below. No additional data ARE available from this study.

The text has been amended to correct this typo.

3) page 13 - pre-launch user feedback. Could you show this data; without it, the reader must rely on your say-so. What did they say, exactly?

Pre-launch user feedback was obtained from reference group and writing group members and potential users in narrative format. Details summarising key points raised has now been added to the manuscript to provide additional context (pg. 13):

“Reviewers indicated the website was easy to navigate, had engaging and useful images and video content and provided educational content at an appropriate level.”

“Potential users (n=3) provided feedback in interviews on website functionality and user experience, agreeing that the website was easy to navigate, engaging and educational. Examples of user quotes included “well laid-out”, “helpful resource”, “useful format for broad range of audiences”, “good balance of graphics / text”, “written at an accessible level for multiple audiences” and “the project is a bold endeavour, which is needed.”

4) page 14 - Toolkit Launch & Usage Metrics - Users accessed the site via organic searches (e.g. Google; 69%), direct links (20%), referral from other sites (9%), and social media (e.g. Twitter; 2%). Room for improvement here to increase/rebalance source sites; see https://www.kaushik.net/avinash/beginners-guide-web-data-analysis-ten-steps-tips-best-practices/ Also, I think you should report other user stats; for instance, how many repeat users you had so far. This indicates how attached users are to the site (repeat visitors) vs 'one night stands'. This will give you a baseline for improvement over time, and tell you where you need to do some work.

We appreciate the reviewer directing our attention to the web resource and will include this recommendation in our future dissemination work relating to the project.

We note that we have already included the proportion and number of repeat visitors in the manuscript based on website analytics (pg. 14) and survey respondents (pg. 15), which provide consistent findings of 13-16% of traffic occurring from repeat visits.

"Returning users made up 13% of visits (4,182 visitors)."

"Most survey respondents (325/386; 84%) were visiting the website for the first time, while 50/386 (13%) had visited several times and 11/386 (3%) visit regularly."

5) page 14 - Post-Launch User Feedback

During the period between 23 March 2018 – 21 November 2019, 394 website visitors completed the on-site user feedback survey. This is a v small percentage of visitors and should be noted as a limitation of the findings. (0.01%) and dictate caution on stating the site is 'successful'. I'd say, 'promising' but some additional work is need to improve dissemination.

We have modified the language to use the word "promising" rather than "successful", as suggested (pg. 19). We have also included additional text highlighting this as a consideration in interpretation and note that the proportion of respondents represents approximately 1.2% of website visitors (394 respondents / 32169 total users):

"We do note that survey respondents represent a relatively small proportion of all users (394 / 32,169 = 1.2%), and caution should be used in extrapolating this data to the total user population."

6) page 16 - The value of this resource has been reinforced by the enthusiastic uptake and dissemination by stakeholder organisations to their respective health care professional networks (e.g. Asthma Australia, TSANZ, National Asthma Council, Lung Foundation of Australia) and official recognition of the website as a TSANZ-endorsed training resource. I don't believe this is mentioned earlier. Please describe how these 'champion' organizations took up and linked to the resource. Can you provide concrete description of how many organizations linked to your site and whether they were

drivers of site visits? You state that referral from other sites was 9%; how does that compare to other data? What is the potential reach of audience via these organisations; what is their membership size? How are you able to categorize this as 'enthusiastic'?

The indicated organisations were involved on the Reference Group in the development of the resource and have subsequently supported its dissemination through web-links, email distributions and inclusion of Toolkit resources in workshops and citations. Other than TSANZ, these organisations do not have specific membership per se, and none of the organisations provide public details on numbers of visitors. Further, they provide resources to a mixed audience of consumers, healthcare providers and the general public. Two of the organisations (TSANZ and Lung Foundation) also have focuses beyond asthma, to include other lung disease. Thus, it is difficult to estimate the potential audience of these organisations, particularly in terms of our target audience of healthcare professionals involved in the care of people with severe asthma. We have removed the term "enthusiastic" from the revised manuscript.

We have included additional text to clarify this interaction (pg. 16):

"The TSANZ is the only health peak body representing a range of professions (medical specialists, scientists, researchers, academics, nurses, physiotherapists, students) across various disciplines within respiratory medicine in Australia and New Zealand. The current membership of TSANZ is ~1700, which includes near complete reach to all Australian respiratory physicians and advanced trainees."

"These organisations added links to the Toolkit on their websites, disseminated details on the resource via email lists, advertised the research at training workshops and have cited the Severe Asthma Toolkit in their distribution materials (e.g. National Asthma Council "Monoclonal Antibody Therapy for Severe Asthma" information paper)."

7) page 16 - New management approaches for severe asthma require access to healthcare resources. While new targeted therapy options are available that provide a personalised approach for patients, effective use of these treatments requires detailed phenotyping of clinical and immunological domains 11. Multidimensional assessment and management of co-morbidities reduce exacerbations and improve asthma control and asthma-related quality of life 24. These approaches require recognition of comorbidities, access to multidisciplinary allied health professionals and effective coordination of care. Dedicated asthma services also improve healthcare use and patient outcomes 25. However, establishment of a severe asthma clinic is complex. The Severe Asthma Toolkit provides content to support users in each of these issues, with evidence-based practical recommendations (e.g. modules on "Asthma Phenotypes", "Phenotyping", "Multidimensional Assessment" and "Establishing a Clinic") and infographics (accessible at https://toolkit.severeasthma.org.au/resources/infographics/).This paragraph is redundant with what you have covered earlier re: purpose/need.

This paragraph is intended to summarise the key purpose / need for the Severe Asthma Toolkit to provide context for the discussion. As such, we acknowledge that it does repeat some elements from the manuscript introduction. We note that this content was also contained in previous manuscript

versions, with no comments in the initial review and in the version approved by Reviewer #2. As such respectively, we feel it provides value and should be included in the manuscript. If there is a preference to remove the paragraph altogether to reduce the total word count, we are happy to do so.

8) page 16 - The result is an online resource that is easy to navigate... How do you know this?

This conclusion is based on user feedback during the pre-launch phase. We have included this additional detail in the results section (see detailed response above to reviewer comment #3).

9) page 17 - User analytics data SUGGEST - no s (singular, as data is plural)

The text has been amended to correct this typo.

10) page 17 - Thus, we propose that over 32,000 total users accessing the Severe Asthma Toolkit represents significant usage, based on the intended target audience. A click is not indicative of 'usage'. What you have demonstrated is that 32,000 clicked on your webpage. That's a start, to be sure, as in, they found it and now know it's there. Usage, however, is another thing entirely. Did it inform their practice? How? Who is coming back/loyal? etc. needs to be uncovered/described in greater detail.

We have removed the word "usage" as suggested. Further we have included additional content to address this comment (pg. 19):

"The Toolkit has been accessed by health professionals engaged in severe asthma (72% of respondents) worldwide in 169 different countries, with approximately 13-16% of repeat user traffic."

"While these data are promising, we recognise that dissemination is only part of the translation process to bring about clinical practice change and improve patient outcomes. Further activities are required to translation this educational resource to support practice change and additional assessment will be required to determine the reach of the Severe Asthma Toolkit and its effects on outcomes."

11) page 19 - In terms of the goals of development, we believe that the Toolkit has been successful. I would soften this statement to say the site shows potential, given the small % of survey respondents.

The text has been amended as suggested.

12) page 19 - It has been extensively accessed by health professionals engaged in severe asthma (72% of respondents) worldwide in 169 different countries. How will you improve source referrals; need to say something about this. You can't just rely on Google/search engines. You need referring sites, but say little about how you worked on this or how you will work on this moving forward. You should aim for 20% to 30% Referring Sites. A healthy web strategy includes a robust amount of traffic from other sites that link to your products and services, and praise (or slam!) you, or promote you on Twitter and Facebook and forums and otherwise link to you. Free traffic (usually) and you do want that (for many reasons).

We thank the reviewer for the advice and have engaged in an active web communications strategy. We have included additional content on this point (pg. 19):

"Additional and ongoing work is now required to increase and maintain user traffic, including collaboration with stakeholder organisations, linking from contributor websites, social media campaigns (e.g. via the Centre of Excellence Twitter account @SevereAsthmaCRE), workshops and professional conferences."

13) page 19 - . Further assessment will be required to determine whether this resource has effects on these outcomes. Agreed, but the phrasing is a bit naïve in light of implementation science evidence that details quite well now what is need to change practice, over and above exposure to resources. Careful here.

The text has been modified, as outlined in point 10 above (pg. 19):

"While these data are promising, we recognise that dissemination is only part of the translation process to bring about clinical practice change and improve patient outcomes. Further activities are required to translate this educational resource to support practice change and additional assessment will be required to determine the reach of the Severe Asthma Toolkit and its effects on outcomes."

14) page 19 - The broad expertise of contributors and active engagement with health professionals, stakeholders and consumers throughout this process were critical to DEVELOPMENT OF THIS WEBSITE; instead of 'this success'.

The text has been amended as suggested, to include (pg. 20):

sthe planning, development and current level of dissemination of this website."

14) page 20 - The website has been extensively accessed by users worldwide. I'm not comfortable with this qualifier. Based on 32,169 total users accessed the website (42,454 sessions; 99,369 page-views) from 169 different countries.

Some work needed here to help with interpretation; this was a comment from the other reviewer, by the way. See: https://www.kaushik.net/avinash/beginners-guide-web-data-analysis-ten-steps-tips-best-practices/

We have removed the word "extensively" from the statement above.

Generally, I think you've demonstrated how you developed a unique and needed resource. Now, you need to improve your dissemination so that you develop wider exposure and repeat /loyal visitors.

We thank the reviewer for their feedback and advice, as well as providing useful resources to support the ongoing dissemination and long-term success of this project.

## VERSION 3 – REVIEW

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|---|---|
| **REVIEWER** | Melanie Barwick<br>The Hospital For Sick Children, CANADA |
| **REVIEW RETURNED** | 23-Feb-2020 |

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|---|---|
| **GENERAL COMMENTS** | Thank you for responding to earlier suggestions on this paper. On this read, I had only one question:<br>Page 7 - "In December 2015, we hosted roundtable discussions with multidisciplinary experts from a range of healthcare disciplines, stakeholder organisations and biopharmaceutical industry 12. The aim of this meeting was… "<br>Did you host one meeting or several? How many? Please specify.<br>Thank you for your thorough responses to my earlier comments. |

## VERSION 3 – AUTHOR RESPONSE

Reviewer #1 Comment: Thank you for responding to earlier suggestions on this paper. On this read, I had only one question: Page 7 - "In December 2015, we hosted roundtable discussions with multidisciplinary experts from a range of healthcare disciplines, stakeholder organisations and biopharmaceutical industry 12. The aim of this meeting was… " Did you host one meeting or several? How many? Please specify. Thank you for your thorough responses to my earlier comments.

The sentence makes reference to a single, full day, roundtable meeting, consisting of several topics / discussions. We have amended the indicated sentence to: "In December 2015, we hosted a full day of roundtable discussions with multidisciplinary experts from a range of healthcare disciplines, stakeholder organisations and biopharmaceutical industry [12]."

We note that a detailed overview of the roundtable meeting, including methodology, topics and outcomes are also published in reference #12 (McDonald et al. 2017 Respirology), as indicated in the manuscript text.

We hope this revised manuscript will now be acceptable for publication in BMJ Open.