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Title	Impact of the connected medicine collaborative to improve access to specialist care: a cross-sectional analysis
Authors	Clare Liddy, MD MSc, Emma Boulay MA, Lois Crowe BA, Maxine Dumas-Pilon MD, Neil Drimer MHSc CHE, Gerard Farrell MD, Laurie Ireland MD, Christine (Kirby) Kirvan MA, Veronique Nabelsi PhD, Alexander Singer MB BAO BCh CCFP, Margot Wilson MSN, Erin Keely MD, Christine (Kirby) Kirvan MA, Veronique Nabelsi PhD, Alexander Singer MB BAO BCh
Reviewer 1	Thomas Freeman
Institution	Department of Family Medicine, Western University, London, Ont.
General comments (author response in bold)	1. "The purpose of this study is to evaluate the impact of the programs implemented through the Collaborative." The impact measures were stated to be: the number of cases completed; the percentage of cases resulting in the avoidance of face-to-face visits; integration of eConsult into clinical workflow; response time to specialist advice; and the number specialities added during the observation period. (page 7, lines 8-17) There could be more discussion as to why these were considered useful for measuring impact. For example, the number of specialties added during the observation period may be an indication of how acceptable the program was to specialists. In any case in one impact measure (integration of eConsult into clinical workflow) is not reported at all, and another (the percentage of cases resulting in the avoidance of face to face visits) was not measured consistently and reported in only 2 with low response rates); response times only responded in 5 services. These shortcomings are covered in the Limitations section. **We have added a section to the methods discussing the outcomes we selected for this study (Page 7):** **"In order to assess the impact of the programs implemented through the collaborative, we assessed them on the following metrics: usage (i.e., the number of cases completed, the average specialist response time), number of specialties available, impact on PCP decision to refer, and impact on ED visits. Together, these metrics illustrate to what extent the service was adopted by users, and what effect it had on patient care."** 2. Another aim of the study is "to refute the notion of Canada as a land of perpetual pilot projects and inform future endeavours for spreading and scaling up healthcare innovations. Canada is more than a bunch of pilot studies", which leads the reader to think we are going to learn about how to scale up a pilot study. This is misleading as it we don't learn what the Collaborative actually did and how its efforts were tied to the impact measures. **We agree that this is misleading and have removed this statement from the introduction.** 3. No where in the paper is it listed what specialties were involved in the various services, but this is relevant since there is literature reporting on significant differences in time to consultation between specialties. For example on page 10, line 52 it states that services offered anywhere from 5 to 37 specialties. Is 37 referring to specialists, specialist groups, or specialties? What were they? Were the specialities involved recruited actively or passively? This would seem to be important for guiding future implementation strategies. Were primary care providers consulted on which specialties they had the most trouble accessing? **The numbers cited in the paper refer to specialty groups, not individual**

	specialists. We have revised the statement you mention to enhance clarity: "All services offered multispecialty access, with specialists from 5 to 37 specialty groups available." **In regards to listing the specialties offered, each service was built independently using one of the two offered models, and as such offers access to a different menu of specialty services. In the case of the original BASE service, launched in Ottawa, Ontario in 2010, specialty groups were added regularly based on PCP request. However, the method for selecting specialty groups, like the groups offered, varies between services. Given these discrepancies, a presentation of the specialty groups offered by each service would greatly exceed the journal's word count, and is outside of the scope of this study.** 4. On page 11, lines 26-38 it is reported that 2 of the services using the RACE method reported survey data on PCP perception of avoided ED visits as a result of the eConsult, but the response rates were low (43%) to very low (7%) and this is not interpretable. This observation, though very relevant to impact, was not named as one of the impact measures to be observed. Because the numbers are so small and coming from only two sites, was this why it wasn't included in one of the measures of impact? **We disagree that the response rate for these surveys precludes their usefulness, given that each survey still obtained a sufficient number of responses (n=171 and n=492, respectively). 43% is not an uncommon response rate for voluntary surveys. We agree that the 7% response rate is quite low, and while we would argue this is partially mitigated by the large number of respondents, it is possible the results are not representative. We have added this point to our limitations (Page 13):** **"Not all teams conducted PCP surveys, and those that did used varying methods that resulted in a range of response rates. Response rates for AHS Calgary Zone Specialist LINK were particularly low, at only 7%, which may cause the sample to be less representative."** 5. Though it may be outside the specific goal of this paper (evaluation of impact), we are left in the dark about what exactly the Collaborative brought to these different services. There needs to be a brief description of how the Collaborative carried out its functions. This sometimes is alluded to in the Discussion when the Champlain BASE (not one of the sites included in this study) experience was made available "prior to peer publication" to the other sites. Earlier (p6, lines 49-52 and page 7, lines 3-6) it is mentioned that the CFHI had provided "seed funding, access to a network of expert faculty and coaches, and tailored curriculum content, delivered through online and in-person sessions aimed at enhancing change management and quality improvement capacity" We are left to surmise that these elements constituted the 'intervention', but don't know what Collaborative services were accessed . While this paper is not an intervention study (a different paper perhaps?), the reader needs to know a little more clearly what the Collaborative actually did. **We have elaborated on the description of the Collaborative's activities (Pages 4-5):** **"Participating teams received support from CFHI in the form of seed funding to support the implementation, spread, scale and evaluation of their innovation. The Collaborative also provided curriculum to enhance their**

	quality improvement skills. This included educational webinars, access to a network of expert coaches and faculty, in-person workshops and peer-to-peer networking. In particular, the collaborative, through its different features, allowed sites to learn and work through implementation challenges together, by providing regular opportunities to share, gain advice and problem solve with the two innovator programs, coaches, and peers." 6. I think more can be said about the limitations of the study. For example, we don't know how long individual case follow ups were done. This is relevant because in the absence of followup, if a practitioner has an eConsult, how do we know if it has, substituted for or simply delayed, a consult later? Were there re-consults? **We have provided more detail on the study's limitations pertaining to its data. However, while you are correct that we cannot independently verify that all patients whose PCPs stated an avoided referral were not eventually referred for a related reason, we should note that our team has done extensive qualitative studies of the case logs of eConsults, and in the vast majority of cases where PCPs report that a referral was originally contemplated but avoided, the specialist has provided sufficient guidance in their response to preclude the need for a referral for that issue.** 7. The authors state that the study shows that the Collaborative supported the spread and scaling up of eConsults. It is relevant to mention how many, if any, of the sites had eConsult services already in place and how many started from scratch. For those who had some service in place, it would be important to know how they functioned before the Collaborative's support were made available. **We have added a sentence to this effect (Page 10):** **"Eight teams focused on expanding services already established prior to the start of the Collaborative, while three teams launched new services during the Collaborative period."** 8. Page 4, line 43 health care funding is a combination of federal and provincial funding, not only federal as stated. **Thank you for this suggestion. We have decided to remove the paragraph on the Canadian healthcare system in order to make room for the other addition requested by reviewers without exceeding CMAJ's stated word limit. We feel that, as CMAJ is a Canadian journal, most of its readers will have sufficient familiarity with the funding model used for healthcare in Canada.** 9. Page 6, line 26-the term team is introduced without describing them; is there a difference between team and services? **Teams refers to the groups that joined the Collaborative in order to implement one of the two offered innovations (BASE and RACE). The term is previously mentioned in the introduction:** **"In an effort to address this problem, the Canadian Foundation for Healthcare Improvement (CFHI) partnered with the College of Family Physicians of Canada, Canada Health Infoway, and the Royal College of Physicians and Surgeons of Canada to launch the Connected Medicine Quality Improvement Collaborative, an 18-month program that connected health care improvement teams interested in improving access to specialist**

	care in their regions with proven remote access innovations. (10) Participating teams received support from CFHI in the form of seed funding, access to a network of expert faculty and coaches, and tailored curriculum content delivered through online and in-person sessions aimed at enhancing change management and quality improvement capacity."
Reviewer 2	Ali Damji
Institution	Department of Family and Community Medicine, University of Toronto, Toronto, Ont.
General comments (author response in bold)	1. In the introduction there is an opportunity to also discuss the cost of unnecessary in person specialist referral. Many conditions can be managed through virtual means to answer a clinical question vs a more costly and inconvenient in person visit for the patient and provider. **While this is an interesting suggestion, the journal requires that our manuscript not exceed 2,500 words, and the necessary additions to the methods/results preclude any expansion of the introduction.** 2. In the methods section, I think it needs to be stated explicitly that the RACE system is intended for more acute urgent issues and that is why it is evaluated using the metrics related to ED referral. **We have added this to the methods section (Page 7):** **"As part of the BASE™ model, PCPs complete surveys at the conclusion of each case assessing the proportion of cases resulting in an avoided referral. Additionally, two RACE services conducted surveys of users to assess the proportion of cases resulting in the patient not being sent to the emergency department (ED) where an ED visit would have otherwise been contemplated. This measure applies exclusively to RACE services, as the BASE model is not designed for questions on urgent cases where ER would be considered. One of the RACE surveys also collected data on the case's impact on referral."** 3. The methods section does not explain how the data was analyzed and only indicates the sources of the data. Please include mention of the statistical analyses done, any subgroup analysis and ways of controlling for confounding data if done in the Methods section. If the study is purely using descriptive statistics then please state that explicitly for the reader. **We have added this description to the methods (Page 7):** **"We used descriptive statistics to assess the impact of implemented services in each jurisdiction."** 4. In the methods section, how is success of the Collaborative being evaluated? Can you please include this in the Methods section. **We added an Outcomes subsection to the Methods to expand on this point (Pages 6-7):** **"In order to assess the impact of the programs implemented through the collaborative, we assessed them on the following metrics: usage (i.e., the number of cases completed, the average specialist response time), number of specialties available, impact on PCP decision to refer, and impact on ED visits. Together, these metrics illustrate to what extent the service was adopted by users, and what effect it had on patient care."**

	5. In the discussion there are a few generalizing statements that are made that I would caution against. For example the statement that the Collaborative refutes the reputation of Canada as the land of perpetual pilots. I would suggest softer language that the evidence suggests that this statement may not be true vs a complete refutation. **We have removed this statement from the manuscript.** 6. In the discussion I would also include details on whether there are any cost saving data that either exist or could be looked into for future studies related to e consults' reduction of in person specialist visits. This could be an effective area of research to show the benefit of this intervention. **Our team has conducted cost evaluations of the original BASE service in Ontario, and found cost savings associated with eConsult. We have added a brief statement to this effect to the discussion (Page 12):** **"Given the cost of specialist appointments to the health care system, coupled with the consequences of excessive wait times on patient outcomes and anxiety and the reduction in costs associated with referrals (travel costs, missed work, etc.), the benefit of these services has been considerable, particularly since economic evaluations of the Ontario BASE™ service have demonstrated significant cost savings relative to the traditional referral-consultation model."** 7. I found a limitation of this paper is that because some teams already had these initiatives established and were focusing on expansion, this is a significant confound. From the text, I am not clear how it is known that the Collaborative led to the improvements that were noticed. I understand that the Collaborative brought partners together and this study describes the data observed during that period. Figure 1 is helpful supporting data for showing how volumes enhanced over time but it is not mentioned much in the discussion. I would strongly recommend including more information regarding the observations from Figure 1 in the Discussion on how the volumes and uptake of the services changed over time during this intervention (the Collaborative). **We have expanded out limitations section to clarify that our ability to infer precise changes from the Collaborative are limited ({age 15):** **"While ten teams participated in the study, they began implementation at different times and the method, frequency and duration of their data reporting varied, making comparisons across services more difficult and limiting our ability to quantify the Collaborative's precise impact on individual services."** **We agree that a further discussion of this is warranted. However, we are limited in our word count and unable to expand the discussion in this paper.** 8. Are there any analyses such as run charts or other statistical analyses that show that the change seen during the implementation period led to a significant change? That could make the assertion that the Collaborative resulted in this improvement much more compelling. For example could the volumes of virtual consultations prior to the Collaborative vs after the collaborative be studied in future work to determine if there is a significant change in the volume noticed, suggesting a true improvement thanks to the intervention? **Unfortunately, this data is not available.**

	9. Do you have data showing changes over time over the period of the Collaborative for response time to consults? Or for the proportion of cases resolved without needing a face to face visit? Did these metrics improve? Unfortunately, this data is not available. We have added a point to this effect to the limitations (Page 13): **"There was no way to follow the individual cases of patients whose PCPs cited avoided referral to confirm that a referral was not made for a related reason sometime in the future. Likewise, the report of ER avoidance speaks only to individual PCP decisions, and cannot measure any change in overall ER referral rates."**