PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Impact of policy support on uptake of evidence-based continuous quality improvement activities and the quality of care for Indigenous Australians: a comparative case study
AUTHORS	Bailie, Ross; Matthews, Veronica; Larkins, Sarah; Thompson, Sandra; Burgess, Paul; Weeramanthri, Tarun; Bailie, Jodie; Cunningham, Frances; Kwedza, Ru; Clark, Louise

VERSION 1 - REVIEW

REVIEWER	Sarah Walker University of Washington, USA
REVIEW RETURNED	29-Mar-2017

GENERAL COMMENTS	This paper reports on the differences in quality of care among jurisdictions with varying levels of policy support for a quality improvement initiative over time. The paper's strengths include individual data across multiple sites of practice, quality of care measures and information on the healthcare policies at the measurement points. To make a substantial contribution to the literature, the paper would be improved by a reorganization and clarification of background and methods, and either a clarification or revision of analyses. The hypothesis that policy impacts quality of care is not sufficiently addressed by the analyses performed; however, given the availability of data it seems that an analysis of this question may be possible. Background: The introduction presents a clear case for the need to examine CQI over time in health policy initiatives Table 1; the narrative in Table 1 is better suited to the background section. It's not clear why it is all in a table. Brief summaries/explanations of variables found in previous studies to be related to CQI would be helpful background, particularly in explaining why they are not the focus or controlled in the present study. Methods The measures are a count of the number of audit tools used, as an indicator of ABCD intensity, and the quality of care index for each audit tool. These are reported only for NT and Queensland because of higher implementation of ABCD. The QCI is calculated by dividing the total number of client services for each client by the total number of possible services in the QCI (if this is correct, the description in the paper should be rewritten for clarity). Analysis With only one predictor variable (jurisdiction) of quality of care, it's not clear that this is really a case control design as much as it is a descriptive report about two jurisdictions. If the model was a time series testing the time-varying effect of number of auditing tools

	used on QCI index, this would be more in line with the author's hypothesis that policy (e.g., use of auditing tools) had an impact on quality. Or, if the data is available, the study could make use of the other jurisdictions in the analysis, to develop a model of the relationship between the number of tools used and the quality of services. However, these ideas would rely on independence in the number of auditing tools and the quality index. It wasn't clear from the methods whether these measurements are really independent (e.g., is the QCI coming from the same measurement tool or process as the count of auditing tools used?). Another analysis strategy could be coding and counting the different types of policies and assess the relationship between number or type of CQI process and resulting number of auditing tools used per client. Given the missing data (which perhaps could be accurately coded as zeros in a count of auditing tools?), the analysis could use a poisson distribution to assess frequency of tools in relationship to number or type of policies at each time point, nested within jurisdiction. Results The majority of the current results section should be moved and edited to fit in the background/introduction section. It is not clear why the jurisdictions beyond NT and Queensland are included as they do not contribute data to the statistical model. Table 2: For easier interpretation, the authors could potentially code or summarize the key levels of support across territories so one could visualize (in a matrix table or graph) the number of different initiatives, perhaps with type, for national/state/regional efforts.

REVIEWER	Monique Kilkenny Monash University, Australia
REVIEW RETURNED	24-May-2017

GENERAL COMMENTS	In-depth and very detailed manuscript on the impact of policy support on uptake of evidence-based continuous quality improvement activities and the quality of care for Indigenous Australians. - The manuscript could be shortened and the words reduced (including the large supplementary tables). Has this been published in a report online that could be referenced? - Table 2 add a column year and then detail initiative in next column will make this easier to read - Table 3 doesn't add value to the manuscript. Please provide data for this Table - File 4 should be included in the main manuscript as it provides important results - The manuscript doesn't provide anything new in the area of CQI as we already know that where support is provided but not sustained there would be rapid rise and subsequent fall in CQI activities. - Were the data normally distributed? if not, median regression should have been used. - Did the authors undertake a sensitivity analysis where only health services who provided audit data for all cycles were included (n=4) or health services who provided audit data (n=3+ cycles). or a matched analyses including only health services that provided data for the same cycles. - Was missing data imputed for QCI? How were these QCI calculated for each quality of clinical care?

VERSION 1 – AUTHOR RESPONSE

Reviewer 1
We appreciate the reviewer's comments on the strengths of the paper.

1.1 Reviewer comments
The paper would be improved by a reorganization and clarification of background and methods, and either a clarification or revision of analyses.

Author's response
We describe the study design as a 'comparative case study design' in the first sentence of the methods section and in the manuscript title. This picks up on a specific call by eminent international health policy researchers to strengthen health policy research, as cited in reference number 22 of the manuscript (Walt G, Shiffman J, Schneider H, Murray SF, Brugha R, Gilson L. 'Doing' health policy analysis: methodological and conceptual reflections and challenges. Health Policy and Planning. 2008;23(5):308-17).

The reviewer appears to have confused this 'comparative case study design' with a 'case control design' as reflected in the comment under the heading 'Analysis' below. The structure of the paper is designed to fit with a comparative case study design. We have therefore retained the structure and analytic approach of the manuscript.

1.2 Reviewer comments
The hypothesis that policy impacts quality of care is not sufficiently addressed by the analyses performed; however, given the availability of data it seems that an analysis of this question may be possible.

Author's response
The reviewer appears to have misinterpreted the aim of the paper in framing the stated aim as a hypothesis. The aim of the paper as stated in the 5th paragraph of the Introduction section (Page 5, Lines 1 – 7) is to

'examine(s) the influence of health policy decisions at the Australian state/territory level and how these may have influenced:
i) trends in the consistent uptake of evidence-based CQI tools available through a research-based CQI initiative (the Audit and Best Practice in Chronic Disease (ABCD) Program; and
ii) quality of care (as reflected in adherence to best practice guidelines) in Indigenous PHC services.'

The comparative case study design, including the analytic approach, has been shaped to specifically address this aim. The nature of many of the 'variables' or 'influences' that are relevant to the subject of our research means that they are not suited to quantitative measurement – hence the mixed methods approach that we have used in this comparative case study.

1.3 Reviewer comments
Introduction - The narrative in Table 1 is better suited to the background section. It's not clear why it is all in a table. Brief summaries/explanations of variables found in previous studies to be related to CQI would be helpful background, particularly in explaining why they are not the focus or controlled in the present study.

Author's response
We presume the reviewer's comment refers to the Introduction rather than the 'background section', as there is no background section in the paper. Table 1 has been designed to break up the text for the purpose of improving readability, consistent with the recommendations of a professional editor. The

table complements the Introduction. The journal requires authors to insert Tables after the paragraph where you first cite the table. Please note the first citation of the Table is on Page 5, Line 14. Depending on the style of the journal, we will be comfortable with including the content of the table in the main text, rather than as a Table or as a Box.

Previous work has highlighted the complexity of processes that may be associated with different trends in the uptake of tools, or with how CQI processes have impacted on quality of care in different jurisdictions. Findings from this work are summarised in the second paragraph of the Discussion (Page 15, Line 13). We have not included an overview of these 'variables' in the introduction as this seems better suited to the discussion section in the presentation of this comparative case study.

1.4 Reviewer comments
Methods - The QCI is calculated by dividing the total number of client services for each client by the total number of possible services in the QCI (if this is correct, the description in the paper should be rewritten for clarity).

Author's response
We have revised the description of QCIs in line with the reviewer's suggestion (Page 8, Lines 1 - 9). "We use a composite Quality of Care Index (QCI) to measure overall adherence to evidence based clinical best practice guidelines in the delivery of care for each audit tool over successive years. The QCIs provide a measure of adherence to a package of evidence based practices within each area of care. They therefore provide a more holistic measure of quality of clinical care (for example overall delivery of type 2 diabetes care) than specific items of care (for example monitoring or control of HbA1c). We report on these QCIs for only the NT and QLD, as these jurisdictions had data available from a large number of health services. QCIs were calculated by dividing the total number of client services for each client by the total number of possible services in the QCI.[12]"

1.5 Reviewers comments
Analysis - With only one predictor variable (jurisdiction) of quality of care, it's not clear that this is really a case control design as much as it is a descriptive report about two jurisdictions. If the model was a time series testing the time-varying effect of number of auditing tools used on QCI index, this would be more in line with the author's hypothesis that policy (e.g., use of auditing tools) had an impact on quality. Or, if the data is available, the study could make use of the other jurisdictions in the analysis, to develop a model of the relationship between the number of tools used and the quality of services. However, these ideas would rely on independence in the number of auditing tools and the quality index. It wasn't clear from the methods whether these measurements are really independent (e.g., is the QCI coming from the same measurement tool or process as the count of auditing tools used?). Another analysis strategy could be coding and counting the different types of policies and assess the relationship between number or type of CQI process and resulting number of auditing tools used per client. Given the missing data (which perhaps could be accurately coded as zeros in a count of auditing tools?), the analysis could use a poisson distribution to assess frequency of tools in relationship to number or type of policies at each time point, nested within jurisdiction.

Author's response
As explained above, the study is not a case control design and the reframing of the study aims as a hypothesis is not an accurate reflection of the aim of the study. The reviewer's suggestion to characterise policy as 'use of audit tools' and the suggestion of modelling number of audit tools used and quality of services would not take account of the complexity of policy influences. It is at least partly because of the complexity of the policy influences that make the mixed methods comparative case study design suited to the aim of this study.

As mentioned on page 8 lines 6-7, we include only the Northern Territory and Queensland as these

jurisdictions have sufficient numbers of health centres contributing data to enable comparison. Also, it would not be appropriate to model the 'number of audit tools used' on the QCI as data for each of the Quality of Care Indices is derived from a singular audit tool. The relationship between QCI and the count of audit tools is explained in the first two sentences in the section on Outcome Measures on Page 7, Line 31 – Page 8, Line 3:
'For the purpose of assessing extent of CQI activity using ABCD standard tools we sum the number of different audit tools used in each health service in each year for each jurisdiction.
We use a composite Quality of Care Index (QCI) to measure overall adherence to evidence based clinical best practice guidelines in the delivery of care for each audit tool over successive years.'

We have underlined the phrase 'for each audit tool' in the text above for further clarity on this point.

1.6 Reviewers comments
Results - The majority of the current results section should be moved and edited to fit in the background/introduction section. It is not clear why the jurisdictions beyond NT and Queensland are included as they do not contribute data to the statistical model.

Author's response
These comments appear to stem from the misunderstanding by the reviewer that the study is a quantitative case control study. The mixed methods approach of the comparative case study design for this study means that there are qualitative and quantitative results. We presume the reviewer is suggesting the qualitative results be moved to the introduction. We have not taken up this suggestion as it does not fit with the study design.

1.8 Reviewers comments
Table 2: For easier interpretation, the authors could potentially code or summarize the key levels of support across territories so one could visualize (in a matrix table or graph) the number of different initiatives, perhaps with type, for national/state/regional efforts.

Author's response
As per our response to a number of the above points, the nature of many of the 'variables' or 'influences' that are relevant to the subject of our research means that they are not suited to quantitative measurement – hence the mixed methods approach that we have used in this comparative case study. We have experimented with various approaches to presenting the information contained in Table 2, and have made some refinements in response to the suggestion from Reviewer 2.

Reviewer 2

2.1 Reviewers comments
The manuscript could be shortened and the words reduced (including the large supplementary tables). Has this been published in a report online that could be referenced?

Author's response
We have worked through several iterations of the paper to ensure it is concise and clear, including engaging a professional editor to assist with this. The current word count is just over 3,700 words – the suggested length for manuscripts is 4,000 words maximum. Given the mixed methods and the scope of the paper, we are reluctant to reduce the length of the paper further as this is likely to detract from the substance of the paper. Some elements of the supplementary tables have been included in reports that have been published online, but not in a form that is suited to the purpose of the specific aims of this paper. It is important to include the supplementary tables in the form that has specifically designed to address the aims of the paper, as they enhance transparency in the analysis and

interpretation of data.

2.2 Reviewers comments
Table 2 add a column year and then detail initiative in next column will make this easier to read

Author's response
Thank you for this suggestion – we have revised the table accordingly.

2.3 Reviewer's comments
Table 3 doesn't add value to the manuscript. Please provide data for this Table

Author's response
The detailed data for Table 3 are in Additional file 2. This is referenced in the text and we have added this information to the Table title. Table 3 is designed to provide a visual summary of the detailed data in Additional file 3. Our approach of using this summary table in the main text and the detailed data in an additional file is designed to reduce the length of the manuscript – recognising the reviewer's comment at point 1 above about the need to keep the manuscript as short as possible.

2.4 Reviewers comments
File 4 should be included in the main manuscript as it provides important results

Author's responses
As suggested by the reviewer, we have included Additional 4 as Table 4 in the main paper, Page 14 Line 8.

2.5 Reviewers comments
The manuscript doesn't provide anything new in the area of CQI as we already know that where support is provided but not sustained there would be rapid rise and subsequent fall in CQI activities.

Author's responses
We have not been able to find any similar empirical studies that examine the relationship between state or territory level policy influences (or corresponding jurisdictional levels internationally), CQI activity and quality of care. We therefore believe that this paper is an important addition to the scientific literature.

2.6 Reviewers comments
Were the data normally distributed? if not, median regression should have been used.

Author's responses
Inspection of residual plots showed no obvious deviations from normality or homoscedasticity. Please see the section on Statistical Analysis under Methods (Page 8, Lines 14 - 28).

2.7 Reviewers comments
Did the authors undertake a sensitivity analysis where only health services who provided audit data for all cycles were included (n=4) or health services who provided audit data (n=3+ cycles). or a matched analyses including only health services that provided data for the same cycles.

Author's responses
To minimise unobserved confounding, we restricted the analysis to those health centres that completed the same number of audit cycles across each jurisdiction. This has been clarified in the Methods section on page 8, lines 19-20. This is a conservative approach given NT health centres have participated consistently for longer periods compared to Qld services. Including all data shows a

larger jurisdictional effect including in maternal and child health (predicted increase of 5% and 7% respectively in NT compared to Qld services).. We therefore do not believe that further sensitivity analysis of the data is warranted

2.8 Reviewers comments
Was missing data imputed for QCI? How were these QCI calculated for each quality of clinical care?

Author's responses
We have revised the description of QCIs in line with the suggestion made by Reviewer 1 (see the paragraph headed Outcome measures, on Page 7 Line 30 – Page 8, Line 13). "QCIs were calculated by dividing the total number of client services for each client by the total number of possible services in the QCI." Further detail on this is provided in reference 12 (Matthews V, Schierhout G, McBroom J, et al. Duration of participation in continuous quality improvement: a key factor explaining improved delivery of Type 2 diabetes services. BMC Health Serv Res. 2014;14(1):1). Missing data were not imputed.

We hope our response to the reviewers' comments, and to the comments of the Editor of BMJ Q&S, meet with your satisfaction.

VERSION 2 – REVIEW

REVIEWER	Sarah Cusworth Walker University of Washington, USA
REVIEW RETURNED	14-Jul-2017

GENERAL COMMENTS	This revision addresses the concerns raised in the original submission regarding better definitions about the CQI packages and the analyses.