Author’s response to reviews

Title: Does delay in planned diabetes care influence the quality of clinical management outcomes for Aboriginal Australians?

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Author’s response to reviews:

Reviewer #1

This is an interesting study on a relevant topic. I do have some concerns about this paper. Overall I think this paper needs to be restructured to read more clearly. There are a number of grammar and spelling errors that I have not commented in detail but have formulated general comments to the authors:

R1.1. The title of the paper could be reformulated to a more focused title. It is a bit confusing whether the focus is specific to diabetes related health outcomes or a study regarding the quality of care. For example, the opening line of the abstract describes the study as examining the association between delay in planned diabetes care and measures of diabetes control, whereas the background section alludes to chronic disease care plans and the quality of disease management

• Response: Agreed, the title has been simplified to “Does delay in planned diabetes care influence the quality of clinical management for Aboriginal Australians?” Page 1, Lines 1-3

The Objective has been edited for consistency with the Title. Page 1, Lines 7-8

Abstract:

R1.2 Methods need to be more clearly written in the abstract section. For example a suggestion might be: This Retrospective analysis of x was conducted in y. Eligible subjects were x who received treatment at x enrolled between x and y. Logistic and Poisson equations were used to determine x and y
• Response: Agreed, the Methods section has been edited for improved clarity, while still restricting the abstract to 200 words Page 1: Lines 9-14

R1.3 The conclusion section of the abstract addresses just two of the research questions (please include no evidence of delay and blood pressure finding)

• Response: Agreed, an additional phrase has been added in the Conclusion of the Abstract – “but not with improved blood pressure control”. Page 1, Line25

Background:

R1.4 Background section should make the points made by the authors more clear to the reader and also grammar must be corrected. The opening paragraph alludes to diabetes being a major health problem in Australia. There are references to the improvement of management of chronic diseases and care plans and clinical outcomes and then the author reverts back to diabetes outcomes. Please clarify within the background section if this study is about healthcare outcomes more generally or diabetes outcomes or quality of care

• Response: The Background section has been edited for grammar and clarity. The general discussion on improved management plans has been restructured so that the description, in paragraph 2 now flows from utilisation to description of care plans. The description of diabetes management has been specified in several places, to distinguish the discussion on diabetes management plans from the more generic literature on chronic disease management plans. Page 3 line 2 to Page 4 Line 2.

R1.5 In general I feel the background is currently missing some important information and references, particularly: Studies that have examined the topic of planned diabetes care and diabetes outcomes. Systematic reviews in the area of diabetes care and related outcomes; Diabetes Conversation Map™ and health outcomes: A systematic literature review. More detail must be included on the background and rationale for the hypothesis of this study, including reference to the existing literature

• Response, Agreed, as discussed in the response to R1.4 the Background section has been edited and reordered. A reference of systematic review of planned diabetes care and diabetes outcomes has been added to the background section to describe the rationale of the current study. Page 3, Lines 31-39.

R1.6 Author needs to check the tense used throughout the paper as there is a switch from past tense to present tense. For example Paragraphs 1, line 10: …"within the NT…there was a gradient in... prevalence increasing …

• Response: Agreed, the manuscript has been edited for consistent tense including a change of “was” to “is” on Page 3 at Line 11
R1.7 Paragraph 1, line 14 should be rephrased to more clearly specify what the complications of diabetes are and if there are any complications more specific to the Aboriginal and non-Aboriginal Australians. It would be useful to know (where possible) what the prevalence of poorly controlled diabetes is within the study population.

- Response, the detail of the life expectancy gap (10 years) has been added to reinforce the impact of diabetes and related conditions. Other details on poor outcomes for Aboriginal people are available, such as high rates of end stage kidney disease, but we think are unnecessary detail in this section. Page 3, Line14.

R1.8 Paragraph 2, please describe what is meant by "improved" primary care management

- Response, The paragraph has been edited. "improved has been replaced by "recommended" (page, line 17). The paragraph contains a description of the activities in a management plans. Page 3 Lines 16-31.

R1.9 In the background section the author reports states that there has been "limited assessment of the impact of planned patience care for chorine diseases…” , please describe what the findings of any studies or the "limited" studies that have examined diabetes outcomes and delay in planned diabetes care in the study population used for this analysis or indeed in the international literature

- Response, A new reference has been added, with a description of measures of control resulting from a introduction of a management plan. We are unable to identify previous studies that assessed the association of delays in implementation of diabetes care plans with measures of quality of care. Page 3, line 33 to 41.

R1.10 Please rephrase Paragraph 2, line 27: "In a previous study we have described"

- Response: Agreed, the sentence has been rephrased to commence “One NT study has described….” Page 3, Lines 19-22

R1.11 Paragraph 2, line 33 is missing some words.

- Response, Agreed, Paragraph 2 of the Background has been restructured and edited. Page 3, Lines 16 -35

R1.12 Please use the background section to indicate what if any studies have examined a documented care plan and diabetes control

- Response, Agreed, Details of references (ref 10-12,14 and new ref 13) which report the association between documented care plan and diabetes control have been reinforced as part of the editing of this section. Page 3, Line 31-37

Methods:
R1.13 This section needs to be rewritten to become more clear and concise. The explanatory variable selection is not clear. The hypotheses need to be set up and articulated in the introduction (prior to presenting these as objectives at end of Background or methods section).

How was the data stratified?

- Response, Agreed, the Methods section has been rewritten including the separation of outcome and explanatory variables. Page 4, line 4 to page 5, line 37

R1.14 The author notes that "cases were selected on the basis of the ICPC-2R codes. Please elaborate on this selection process. Why were selection factors such as duration of diabetes omitted?. Please state the reasons for choosing this selection criteria?"

- Response, The selection criteria have been edited for clarity. Page 4, lines 23 to 33 and “all” has been added in Data sources to make clear that all patients meeting the selectin criteria were included. Page 4, line 6

- In additional response to this question a new variable has been added to the multivariate analyses which is the time between diagnosis and the end of the study. This was an oversight in our earlier analysis and has reduced the scale of risk between delay and the outcome measure of number of diabetes-related admissions. The new variable of time-in-study is described in the methods section page 5, line 22-25 and also in Results for diabetes-related admissions. Page 7, line 8-10

R1.15 A table that lists and describes the outcome and explanatory variables coding and cut-off points would prove useful here.

- Response, The Methods section describes all outcome and explanatory variables and are listed in the tables with results. We do not think that an additional table is of benefit.

R1.16 There are some words missing in the paragraph before "statistical analysis" : "At the time of implementation". Some of this section ought to be moved to discussion and limitations section

- Response, This paragraph has been edited. The statistical methods have been simplified by replacing logistic regression used for the two binary outcomes with Poisson regression. Poisson regression is now used for all three outcomes with results expressed as Incidence Rate Ratios.

Results:

R1.17 Results section needs to shortened and written more clearly. For example there is no need to write "There was evidence for an association between x and y. Please clearly state the results
• Response: Agreed, the Results section has been edited for readability and reduced in length. Page 5 Line 34 to Page 6 Line 40

R1.18 Has the socioeconomic and demographic characteristics of the aboriginal population have been reported elsewhere?

• Response, we are uncertain of the purpose of this question. Socioeconomic characteristic were not included in the analysis. No change has been made in response to this question

R1.19 The author is not describing all the other characteristics. It feels like some part of the results are currently lacking.

• Response: We have added further details of characteristics in the Results section at page 6, lines 2-14

R 1.20 I would recommend you to describe the results of all the models completely, since this is the core of your research.

• The description of associations with other explanatory variables in the three multivariate models are described are now described more fully in the Results section including age group and sex for the outcomes of mean HbA1c at page 6, lines 22-24; and for BP control at page 6, lines, 27-30. All association with all variables in the regression model for the outcome of diabetes-related admissions are now described. Page 7, lines 5 -10.

R1.21 Please describe why the results presented according to age and gender.

• Response, Age and sex influence both diabetes incidence and health seeking behaviour. The models were adjusted for age and sex to control for potential confounding. An explanation has been added to the relevant section in methods. Page 5, line 24-26

R1.22 Please provide a descriptive analysis of the study population in table format including the total number of observations used in this study. Information is lacking on participant characteristics. Please add these in the beginning of the results. It would be good if the reader gets some insight in the generalizability of the findings.

• Response, Agreed, we have added a table (Table A2), with age group and sex distribution which we suggest be added as an Appendix table. However the table contains little detail and we think is of only marginal value.

R 1.23 Some of the language used in this section ought best be used in the discussion section.

• Response, Agreed, the results section has been extensively edited, and discussion of results is confined to the Discussion
R1.24 I am wondering if all the variables referred to in this section are the final predictors? Were other explanatory variables used or explored. For example, there are several situations in which the level of HbA1c may not faithfully reflect the glycemic control in a given patient. Important among these is the use of certain non-diabetic medications, were these available or examined? Other explanatory variables that might prove useful include duration of diabetes, SES. Healthcare utilization, i.e., occurrence of diabetes related visits may also be affected by insurance schemes, healthcare access and income levels. Were these controlled for?

- Response: Agreed, the Results section has been edited to include result for all explanatory variables used in the models. All patients are from NT remote Aboriginal communities which have consistent low SES and no access to private insurance. All variables used in the models are described in the revised methods section. HBA1c is a standard measure of control of diabetes.

R 1.25 Please describe how you built your models and which variables were included in which model. Did you combine all the variables into one model? Or did you use a model per variable?

- Response, the methods and results section have been extensively revised. All variables are presented in a single multivariate model for each outcome.

R 1.26 Please provide the table number and not "same table"

- Response: Agreed, now written as Table 2. Page 6, line 25

R 1.27 Please describe what is shown in the tables more clearly. A number of spelling errors: For example, Line 48, …Males were slightly more likely to be hospitalised than females (not that)

- Response: Agreed the description of information in the tables has been amended as part of the general editing of the Results section.

R1.28 The titles of the tables need to be rewritten or explained better. The "Impact" of …I would suggest another word like association or relationship.

- Response, all title of tables have been revised.

R 1.29 The format of table 1 is not very clear to read. This table needs to be reformatted. For example, please describe why the differences in numbers, a more clear description on what this table describes

- Response, Agreed, the table has been reformatted. The authors have updated the text with revised number of participants, Page 6, lines 20-28.
1.30 Table 2 has indigenous included in the title, which differs to the other titles, please specify why so (why not Aboriginal?)

- Response: Agreed the Titles of all Tables have been edited for consistency.

1.31 The majority of tables do not include the total number of observations. Please include these

- Response: Agreed the number of observations in each analysis has been added to the tables.

Discussion:

1.32 Overall the discussion is informative but lengthy. Please try to ensure that your discussion points are critical of the literature, or consider the ways in which the results have may influence your specific cohort. The discussion section should include a description of what the findings were, what they are in relation to the literature - i.e. have the authors found something new along with a discussion on policy implications. As well as a clear section on strengths and limitations of the current study It might be useful to use the initial lines of the first paragraph in the discussion section clearly describe what this study found and then compare the findings to other studies

- Response, Agreed, the Discussion has been extensively edited to be more focussed on the results. Page 7 line 14 to page 9 line 2

1.33 In paragraph 2 of the discussion section the author notes that this study's findings are consistent with others suggesting that a development of a disease care plan was associated with a reduction in the number of diabetes related hospital admissions. This is a sweeping statement and should be compared to other studies in terms of what each study controlled for. It is quiet suggestive to say from the findings in this study that a disease care plan was associated with a reduction of diabetes related admissions, given the number of explanatory variables omitted in this analysis. For example there may be other factors influencing diabetes related hospital admissions. Did the other studies control for other factors that I have previously alluded to that may affect hospital admissions (income, SES, access etc.)

- Response, The Discussion as been extensively edited and conclusion are more cautious. The population is a relatively homogenous population from remote Aboriginal communities and all communities are at the lowest end of the spectrum of SES. Individual level SES was not available for inclusion in the analysis.

1.34 The author also alludes to the results of this analysis to be consistent with the argument of improved primary care management leading to a reducing in health care costs. This analysis did not directly examine health care costs and should discuss this within this context.
Response. Agreed, the reference to reduced health care costs is now directly referenced to the original paper. Now included in Paragraph 1 Page7, lines 28-33

R1.35 The second paragraph in which the author notes the findings to suggest that a primary care plan could improve health outcomes and reduce complications. This must be discussed more clearly, for example, how can the care plan do this within this population?

Response. Agreed, this section of the Discussion has been rewritten and incorporated into paragraph 1. Page 7, lines 21-36

R1.36 Is the study population representative of the Aboriginal population? Please discuss generalizability of the study to this population and indeed how other studies findings translate to this population

Response: Agreed, additional detail on generalisability has been added to the paragraph in the Discussion on limitations. Page 8, lines 22 to 30

R1.37 Strengths/limitations: please reflect on generalizability using characteristics of the sample. Overall, I have problems with understanding your findings (because the models are not clearly describe) and that makes it also hard to follow your discussion. For me it is unclear whether the predictors you found are in separate models or in one model?

Some limitations not mentioned are omitted explanatory variables (noted in comments in the methods section) Also, factors that Interfere with HbA1c Measurement affect interpretation of HbA1c results.

Please consider including further information on the limitations of this work or how yours differs from the literature, other than the cohort evaluated, in order to further highlight the need for this study.

Response, Agreed, we have added additional details on limitations including the lack of adjustment for unmeasured factors such as SES and quality of health services. Page 8, lines 21-43

R1.38 There is a notable lack of referencing in paragraph 4

Response, Agreed, we have added additional reference for this section, now paragraph 3. Page 8, lines 3-17

R1.39 A note on the public health implications might be useful within the discussion section and also in the conclusion section
• Response, The wider implications of the study have been revised, including in the concluding paragraph. Page 8 line 44 to Page 9 line 4

References:

R1.40 Please check references. There are missing references in the methods section. The author often notes two points that require referencing but provides only one reference. Please check referencing throughout the paper. Please also include references in the methods section "outcome measures and explanatory variables"

R1.40 We have thoroughly checked the reference and have added the missing in the method and other sections:

• We added on Outcome Variables reference 13 on page 5 line 11 and reference 27 on line 18.
• We also added references 8 and 9 on Explanatory Variables on page 5 line.

Reviewer #2:

This paper is a useful addition to the literature on the timely introduction of formal care plans for patients with chronic diseases. This paper focused on the introduction of such care plans in patient with diabetes mellitus in remote aboriginal communities in the Northern Territory of Australia.

The aim of the research was clearly stated i.e. to examine the association between a delay from diagnosis to documentation of a chronic disease care plan and three outcome measures of the quality of diabetes care (mean HbA1c level, blood pressure and number of diabetes related hospital admissions). Logistic regression was used with the key explanatory variable being delay between diagnosis and documentation of the care plan (grouped into 4 categories: <60 days; 60 days-24 months; 24-48 months; > 48 months). The data sources used were explained in detail and appear appropriate.

R2.1 The results are in keeping with those observed in other studies (with the novelty of this paper being this particular patient population). However, on the second page of the results section (lines 23-34) the figures quoted do not match those of Table 3 - perhaps an updated table should have been imported? Hence the gradient which is mentioned (i.e. that diabetes related hospitalisation increase with increase in care plan delay) is observed - However, there is no
mention of the fact that number of hospitalisations fall for those with NO care plan in comparison to those who did not have a care plan in place for 4 years or more.

• Response, Agreed, numbers in the results section (for diabetes related hospitalisation) on the third paragraph have been corrected and are now consistent with Table 4. We have added a description of the group with no care plan. Page 6, lines 12-14.

R2.2 In the following paragraph (line 39) table 3 is referred to in the text as opposed to table 4 - and no results are presented for patients with 'no care plan'. This discrepancy would need to be resolved appropriately.

• Response, Agreed, we have corrected the numbering of tables. The group with no care plan is included in the descriptive tables but not in the regression analysis for the following reasons: the number are small and half of the group are newly diagnosed patients. This is discussed in revisions to the Results section. Page 6, lines 12-14.

R 2.3 Assuming the above can be resolved it would appear that the key message of this paper is that reducing delay in implementation of chronic care plans in this patient population has the potential to improve clinical outcomes. Depending on the reason for the discrepancies around tables 3 and 4, if it is the case that some individuals without care plans (albeit small numbers) have lower diabetes related hospitalisations this is a valid result and should be addressed in the discussion section.

• Response. Agreed as described in the response to the Reviewers comments at R2.2, we have added description in the results section. The key messages are described in the Discussion.

R 2.4 For those who would seek to replicate the clinical gains outlined in this paper, more detail around the chronic care plan process would be useful, provided either succinctly within the paper or by reference to another paper.

• Response: Agreed. a description of the content of chronic disease care plans is included in the Introduction along with relevant references. Page 3, lines 26 to 31

R 2.5 Some additional discussion around adherence to care plans and difficulties in ensuring continuity of care in this highly mobile population and the importance of maintaining up-to-date linked patient databases would be very useful with respect to context.

• Response, Agreed, A description of the mobility of the population and barrier to services is included in the Discussion in several places including at Page, 8, lines 10-17, further detail on unmeasured variables, Page 8, line 37-39 and a new reference on the turnover of health staff has been added. Page 8, line 17