

## PEER REVIEW HISTORY

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## ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	Prevalence and correlates of advance care directives among older Australians accessing health and residential aged care services: multi-centre audit study
<b>AUTHORS</b>	Detering, Karen; Buck, Kimberly; Ruseckaite, Rasa; Kelly, Helana; Sellars, Marcus; Sinclair, Craig; Clayton, Josephine; Nolte, Linda

## VERSION 1 – REVIEW

<b>REVIEWER</b>	Maryann Street Deakin University, Australia
<b>REVIEW RETURNED</b>	09-Sep-2018

<b>GENERAL COMMENTS</b>	<p>Thank you for the opportunity to review this very well written manuscript addressing the prevalence and factors associated with advance care planning and directives in three different health care settings. The following comments and suggestions are aimed to provide clarity to the reader where needed, as this is a complex area and terminology varies across jurisdictions.</p> <p>Title and Aims: The Title of the manuscript and Aims as described in the abstract and body of the work both relate to Advance Care Directives. As described in the Introduction (p4), 'Advance Care Directives are the written documents recognised by common law or specific legislation that are completed and signed by competent adults' and are a component of Advance Care Planning. Therefore the reference to 'other types of ACP documentation' (Introduction p4, p5, Outcome measures p7 and Appendix 3, Table 1) is confusing. Please clarify whether 'other ACP documentation' listed in Appendix 3, was included as one of the three categories of Advance Care Directives (primary outcome) in determining the prevalence of ACDs or was ONLY a secondary outcome.</p> <p>Introduction: The authors should consider whether to use the abbreviation SDM for 'Substitute decision-maker', as this abbreviation is commonly used for 'shared decision making', that is a process rather than a person.</p> <p>Methods: The methods are clearly written with the exception of the point raised above relating to primary and secondary outcome measures.</p> <p>Results: The paragraph on page 10 relating to misclassified documents recoded prior to analysis was confusing. I suggest this might be more appropriate to include in the methods section as a point for data validation. There is a need for clarity around how the documents were originally classified, but it would appear this was during data collection and related to interpretation of the title of the</p>
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	<p>document. If so, this is not a finding of the study.</p> <p>Table 3: This is an important table providing detail to compare states and health care settings for each of the three types of ACDs. Some comment about the difference between zero [0 (0.0)] and dash [-] would be helpful. My interpretation is that zero relates to a category being in the sample, but no ACDs were found in those patients records, compared to dash relating to a category that was not in the sample. Is this correct?</p> <p>P12 second paragraph – suggests that some people included in the sample had Advance Care Directives and ‘other ACP documentation’. This adds another layer to the point raised above asking for clarity around the two outcome measures.</p> <p>Figure 1 – It is noted that reference groups are included and described as presented without 95% CI straddling the line at 1.0. However, this makes the figure cluttered with extraneous information.</p> <p>Discussion: Overall, the discussion and conclusions are clear and supported by the findings. The final statement for paragraph 1, p13 ‘to what extent some of these documents actually influence the care received by the person is uncertain’ is a good point to make, but beyond the scope of this study. Therefore, I suggest removing it or providing a reference to other literature.</p> <p>References: The references are comprehensive and relevant. A consistent typographical error was noted with a lack of space between the journal title and year. Should Reference 11 have a webaddress?</p>
<b>REVIEWER</b>	<p>Kazuyoshi Senda, MD PhD</p> <p>National Center for Geriatrics and Gerontology Innovation Center for Clinical Research Chief of Clinical Research Promotion Japan</p>
<b>REVIEW RETURNED</b>	26-Sep-2018
<b>GENERAL COMMENTS</b>	<p>General comments</p> <p>This manuscript of Dr. Detering, et al. reported prevalence and correlates of advance care directives (ACD) among older Australians with the aim of enhancement advance care planning (ACP) uptake, through improvement of ACP data collection methodology, implementation strategies, evaluation processes, and understandings of impact of ACP initiatives by organizations and government. The authors described types of ACDs and ACP documentation, and compared prevalence of ACDs among different Jurisdictions and sectors, with the methods reported their former article, Ruseckaite R, et al. BMJ Open 2017;7:e018024. doi:10.1136/bmjopen-2017-018024, “Protocol for a national prevalence study of advance care planning documentation and self-reported uptake in Australia”, which was rigid study design. Their effort to investigate 2285 health records is admirable. The authors’ results and discussions should be open to the research and practice communities in ACP internationally. A majority of international followers in ACP promotion would refer the authors’ results and discussions.</p> <p>The authors concluded that approximately 30% of Australians aged 65 years or over had at least one ACD in their health record, which is worth praising. This reviewer also emphasizes the results that approximately 50% of participants had engaged with ACP in some way, which are 30% ACD holders plus 20% with ACP documentation other than ACDs. This number is honorable and one of the models or benchmarks to promote ACP for sense of security</p>

	<p>of older people in the world, which is appropriate to be described in abstract.</p> <p>Although the distinction between non-statutory ACD and other ACP documentation was well described in their former methodological article and introduction section, this reviewer asks the authors to describe the definition and rationality to distinct ACD to ACP briefly in abstract for readers' better understanding.</p> <p>As the authors stated that the correlates of ACD completion was investigated in their title and objectives in abstract, this reviewer suggests the authors to refer the correlates of ACD completion in results and conclusion section of abstract, and in conclusion of discussion section. This reviewer thinks much of the authors' results that higher odds of having an ACD for those who were in a residential aged care facility(RACF), and for those who people with functional impairment, which is appropriate to be described in abstract.</p> <p>Specific comments</p> <p>Page 4, lines 10, This reviewer asks to cite reference article #1 along with the international landmark articles of substitute decision-maker in ACP for the readers other than Australians to comprehend ACP and ACD deeply with global standards literatures. This reviewer also asks the authors same way for reference article #2, #4, #5. From this reviewer's point, the authors' considerations seem to be generalized globally, so that this reviewer suggests the way to consider the readers other than Australians.</p> <p>Page 14, lines 15 to 35, The authors proposed further efforts to increase uptake of ACP in hospitals and general practices, and to understand barriers against ACP promotion. Subsequently, they described universal strategies to promote ACP implementations. As they provided comparison of prevalence of ACP among RACF, hospitals, and general practices, this reviewer asks discussions about the reasons why lower prevalence in hospitals and very low prevalence of ACP in general practices, the analysis of setting-specific obstacles to raise prevalence of ACP, and specific schemes to promote ACP implementation at each setting from the authors' observations at this time, not future perspective, which was described at Page 16, lines 5 to 10. Even provisional discussions are acceptable.</p> <p>Page 16, lines 10, The description, "the impact of limited ACDs at the point of care on person-centered outcomes", is a little difficult to understand for this reviewer, so that this reviewer suggests to rewrite in more plain expression.</p> <p>This reviewer really hopes that these comments improve this manuscript.</p>
<b>REVIEWER</b>	<p>Tanja Krones University Hospital/University of Zürich Clinical Ethics Unit Gloriastrasse 31 8091 Zürich</p> <p>I am president selected of the scientific society on Advance Care Planning international (ACP-i), as such involved in ACP implementation myself and I do personally know the first author</p>
<b>REVIEW RETURNED</b>	04-Oct-2018
<b>GENERAL COMMENTS</b>	- The article describes a cross-over prevalence study of Advance care planning across health care settings and different legislations in

	<p>Australia. The study is one of the largest national studies on prevalence rates of various ACP documents not only relying on self reported measures but on a transparent and rigorous audit system allowing for screening paper and electronic health records, by previously trained researchers.</p> <p>The study is innovative, well-planned and structured. The study protocol was published in BMJ open in 2017 before the recruitment (retrieval of study records) started ( Ruseckaite et al 2017) and provides in principle the opportunity that the study can replicated in other settings with some adaptations regarding national/local differences of the health care sector.</p> <p>Findings on statistically significant differences of the quality and quantity of ACP documentation and predictors for having an ACP documents reveal that for the age group over 65, socio-demographics seem not to play an important role- yet, to be a nursing home resident and to have a high ECOG status.</p> <p>Several limitations of the study are adressed and useful suggestions made for further research.</p> <p>Yet, the reason why I ticked “no” in the ethics section and recommend a major revision, also requiring statistical review are the following points:</p> <p>1) In the study protocol, the study was described as consisting of two (rather: three) parts: 1) the health record audit part of health record data, allowing for the estimates of prevalence of ACP documentations and predictors for having such a document, as reported in the paper; 2) a survey on care preferences of those participants whose records were screened and 3) exploration of the consistency of medical orders and care plans with documented wishes. At least for the survey, an informed consent has to be given by the patient. As the same number of the research clinical ethics comitee approval number is given for all parts of the study as for the study on ADs only I was wondering why the authors state that no IC was necessary for this study. Was the survey and medical care plan part skipped or will it be reported elsewhere? At least, information should be given regarding the fate of the other study parts reported in the published study protocol and their interconnection with each other.</p> <p>2) Regarding the statistical analysis, I was wondering if cluster effects and missing values are appropriately dealt with. I am not a statistician but according to my understanding, the statistical analysis should integrate possible cluster effects and deal with missing values with multiple imputation rather than listwise deletion, since data should be close to representativeness. . As participants were collected in nursing homes, hospitals and practices, a cluster effect of the variables collected is very likely and via a listwise deletion of missing values (which are considerable regarding several variables) cases are lost and the sample less representative (and might be even more skewed/influenced by the cluster effect ) . Should the sample not be compared to national Australian statistics of people over 65 to discuss representativeness</p> <p>3) The main outcome reported in this study is the prevalence of ACP documentation as a surrogate parameter for the “real” patient oriented outcome ACP outcome of goals concordant with care , as discussed in the recent Delphi studies on ACP by Rebecca Sudore and Judith Rietjens (Sudore RL, Heyland DK, Lum HD, et al. Outcomes that Define Successful Advance Care Planning: A Delphi Panel Consensus. J Pain Symptom Manage 2018; 55:245-255.doi:10.1016/j.jpainsymman.2017.08.025. The existence of an ACP document per se is only a surrogate parameter and high prevalences of ACP documentation might – in some circumstances-</p>
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	<p>even be a sign of “forced” ACP , as some authors critically discuss with regard to nursing home policies. The data of the study on the survey on preferences and goals of care, as entailed in the study protocol is of course able to fill this gap, but as only the data on prevalences are reported here, its value as an ACP patient oriented outcome should be more critically discussed, also with regard to ACP documentation without any facilitation.</p> <p>4) In general, the references and descriptions are quite exclusively reporting Australian views, not citing recent international studies on ACP in nursing homes, ACP in the US (including prevalence studies and impact on health care such as the POLST in Oregon , Tolle, Teno, . N Engl J Med. 2017 Mar 16;376(11):1078-1082. doi: 10.1056/NEJMs1612511., ACP in General practice Meeussen K, Van den Block L, Ehteld M, et al. Advance care planning in Belgium and The Netherlands: a nationwide retrospective study via sentinel networks of general practitioners. J Pain Symptom Manage 2011; 565-77 and ACP also with regard to ACP documentation in nursing homes (in der schmitt et al Implementing an advance care planning program in German nursing homes: results of an inter-regionally controlled intervention trial; Dtsch Arztebl Int 2014; 111(4): 50-7; DOI: 10.3238/arztebl.2014.0050 Gilissen J, Pivodic L, Smets T, et al. Preconditions for successful advance care planning in nursing homes: A systematic review. Int J Nurs Stud 2017; 66: 47-59. doi: 10.1016/j.ijnurstu.2016.12.003.; As the study describes the Australian situation, this is in part appropriate of course. Yet, some statements are made as if they report worldwide views especially in the introductory part (e.g. “ACDs are written documents (...) that are completed and signed by competent adults”. Some legislations e.g. in Europe also allow completion of advance directives by competent minors or by surrogates, together with incompetent adults following the concept of assisted autonomy. The huge differentiation between non statutory and statutory documents made in the article due to the Australian situation could also be discussed more openly if world views and experiences are included which would allow for criticizing this division – as in many countries, every statement written by a patient including values, goals and medical treatment refusal and consent to treatment are legally valid, as e.g. in Germany.</p>
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## VERSION 1 – AUTHOR RESPONSE

### Reviewer: 1

- Title and Aims:** The Title of the manuscript and Aims as described in the abstract and body of the work both relate to Advance Care Directives. As described in the Introduction (p4), ‘Advance Care Directives are the written documents recognised by common law or specific legislation that are completed and signed by competent adults’ and are a component of Advance Care Planning. Therefore the reference to ‘other types of ACP documentation’ (Introduction p4, p5, Outcome measures p7 and Appendix 3, Table 1) is confusing. Please clarify whether ‘other ACP documentation’ listed in Appendix 3, was included as one of the three categories of Advance Care Directives (primary outcome) in determining the prevalence of ACDs or was ONLY a secondary outcome.

As suggested, we have updated our definition of ACDs and provided greater clarification regarding other documentation as follows:

*“In Australia, an ACD is a type of document recognised by common law or statutory legislation that is completed and signed by a competent adult”* (Page 5, Paragraph 2 – Marked copy)

*“ACP may also result in ‘other ACP documentation’.[15] These are documents that relate to ACP but do not meet the definition of an ACD,[12] and may include documents written on behalf of a person without capacity (by family, substitute decision-makers or clinicians) or informal, personally written letters.[15] Additionally, there are documents written by health professionals that describe medical action to be taken in the event of emergency. In Australia, these include goals of care forms and resuscitation orders and serve a similar purpose to that of the Physician Orders for Life Sustaining Treatment (POLST).[16]” (Page 6, paragraph 2 – marked copy)*

In addition, we have updated our aims to clarify that “Other ACP documentation” was not included in our primary outcome as follows:

*“The secondary aim was to determine the prevalence of other ACP documentation.” (Page 7, Paragraph 1 – Marked copy)*

2. **Introduction: The authors should consider whether to use the abbreviation SDM for ‘Substitute decision-maker’, as this abbreviation is commonly used for ‘shared decision making’, that is a process rather than a person.**

As suggested, we have amended the abbreviation of SDM to substitute decision-maker throughout the manuscript.

3. **Methods: The methods are clearly written with the exception of the point raised above relating to primary and secondary outcome measures.**

As mentioned in response to Comment 1, we have included a secondary aim to distinguish primary and secondary outcomes measures.

4. **Results: The paragraph on page 10 relating to misclassified documents recoded prior to analysis was confusing. I suggest this might be more appropriate to include in the methods section as a point for data validation. There is a need for clarity around how the documents were originally classified, but it would appear this was during data collection and related to interpretation of the title of the document. If so, this is not a finding of the study.**

As suggested, we have moved the paragraph to the Methods section and reworked the text to make it clearer that the misclassifications occurred during data collection:

*“Analysis of text descriptions of the names of documents indicated that 38 documents were misclassified by data collectors during data collection. These 38 documents were recoded prior to analysis. Specifically, 14 documents that were incorrectly classified as statutory ACD: preferences for care were reclassified as either statutory ACD: substitute decision-maker (n=6), non-statutory ACDs (n=3), or other ACP documentation (n=5). In addition, 24 documents that were incorrectly classified as other ACP documentation were reclassified as statutory ACD: preferences for care (n=13) or non-statutory ACDs (n=11).” (Page 9, paragraph 1 – marked copy)*

5. **Table 3: This is an important table providing detail to compare states and health care settings for each of the three types of ACDs. Some comment about the difference between zero [0 (0.0)] and dash [-] would be helpful. My interpretation is that zero relates to a category being in the sample, but no ACDs were found in those patients records, compared to dash relating to a category that was not in the sample. Is this correct?**

To provide further clarification we have expanded the table footnote to read:

*"Note: A dash [-] indicates a particular sector/jurisdiction that was not represented in the study. N/A indicates a document that is not available in a particular jurisdiction"* (Page 15 – marked copy)

6. **P12 second paragraph – suggests that some people included in the sample had Advance Care Directives and 'other ACP documentation'. This adds another layer to the point raised above asking for clarity around the two outcome measures.**

As described in response to Comment 1, we have revised the definition of 'other ACP documentation', as well provided further clarification regarding the secondary aims of the study as follows:

*"ACP may also result in 'other ACP documentation'.<sup>[15]</sup> These are documents that relate to ACP but do not meet the definition of an ACD,<sup>[12]</sup> and may include documents written on behalf of a person without capacity (by family, substitute decision-makers or clinicians) or informal, personally written letters.<sup>[15]</sup> Additionally, there are documents written by health professionals that describe medical action to be taken in the event of emergency. In Australia, these include goals of care forms and resuscitation orders and serve a similar purpose to that of the Physician Orders for Life Sustaining Treatment (POLST).<sup>[16]</sup>"* (Page 6, paragraph 2 – marked copy)

*"The secondary aim is to determine the prevalence of other ACP documentation."* (Page 7, Paragraph 1 – Marked copy)

7. **Figure 1 – It is noted that reference groups are included and described as presented without 95% CI straddling the line at 1.0. However, this makes the figure cluttered with extraneous information.**

To simplify, we have removed the reference groups from the figure and instead listed the reference category for each comparison, e.g., "Cancer: yes vs no", "Morbidity: co-morbid vs uni-morbid".

8. **Discussion: Overall, the discussion and conclusions are clear and supported by the findings. The final statement for paragraph 1, p13 'to what extent some of these documents actually influence the care received by the person is uncertain' is a good point to make, but beyond the scope of this study. Therefore, I suggest removing it or providing a reference to other literature.**

As suggested, we have removed this statement.

9. **References: The references are comprehensive and relevant. A consistent typographical error was noted with a lack of space between the journal title and year. Should Reference 11 have a web address?**

These errors have been corrected.

**Reviewer: 2**

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10. The authors concluded that approximately 30% of Australians aged 65 years or over had at least one ACD in their health record, which is worth praising. This reviewer also emphasizes the results that approximately 50% of participants had engaged with ACP in some way, which are 30% ACD holders plus 20% with ACP documentation other than ACDs. This number is honorable and one of the models or benchmarks to promote ACP for sense of security of older people in the world, which is appropriate to be described in abstract.

As suggested, we have included the following sentence in the 'Conclusions' section of the Abstract:

*"In this study, 30% of people had ACDs accessible and a further 20% had other ACP documentation, suggesting that approximately half of participants had some form of ACP."* (Page 3, paragraph 1 – marked copy)

11. Although the distinction between non-statutory ACD and other ACP documentation was well described in their former methodological article and introduction section, this reviewer asks the authors to describe the definition and rationality to distinct ACD to ACP briefly in abstract for readers' better understanding.

As suggested, we have amended the Objectives section of the abstract to include a definition of advance care directives and 'other ACP documentation' consistent with our previous protocol paper as follows:

*"Advance care directives (ACD) are a subset of ACP documentation, and refer to structured documents that are completed and signed by competent adults. Other ACP documentation includes informal documentation by the person or on behalf of the person by someone else (e.g., clinician, family)."* (Page 2, Paragraph 1 – Marked copy)

12. As the authors stated that the correlates of ACD completion was investigated in their title and objectives in abstract, this reviewer suggests the authors to refer the correlates of ACD completion in results and conclusion section of abstract, and in conclusion of discussion section. This reviewer thinks much of the authors' results that higher odds of having an ACD for those who were in a residential aged care facility(RACF), and for those who people with functional impairment, which is appropriate to be described in abstract.

Thank you for this suggestion. We have now referred to the correlates of ACD completion in the Results and Conclusion section of the Abstract and in the conclusion of the Discussion section as follows:

*"Multivariate logistic regression showed the odds of having an ACD were positively associated with greater functional impairment and being in a RACF or hospital compared to general practice."* (Page 2, Results section – Marked copy)

*"Correlates of ACD completion were greater impairment and being in a RACF or hospital."* (Page 3, Conclusions section – Marked copy)

*"The correlates of ACD completion were greater functional impairment and being in an aged care facility or hospital compared to attending general practice."* (Page 21, Paragraph 2 – Marked copy)

13. Page 4, lines 10, This reviewer asks to cite reference article #1 along with the international landmark articles of substitute decision-maker in ACP for the readers other than

Australians to comprehend ACP and ACD deeply with global standards literatures. This reviewer also asks the authors same way for reference article #2, #4, #5. From this reviewer's point, the authors' considerations seem to be generalized globally, so that this reviewer suggests the way to consider the readers other than Australians.

As suggested, have included reference to the international context as follows:

*"Internationally, there is considerable variation in the terminology, documentation and legislative frameworks related to ACDs.[6-11]"* (Page 5, paragraph 2 – marked copy)

In addition, the following paragraph has been included in the discussion:

*"From an international perspective, the results found in this study are comparable to a recent systematic review of 150 studies in the United States, which reported an average ACD prevalence of 36.7%.[34] However, other international ACD prevalence estimates vary. In aged care settings, prevalence rates range from 11-36% in Germany,[26, 27] to 16% in Taiwan,[28] to 59% in the United States.[29] In general practice, a prevalence of 33% was found in one European study [30] while a Canadian study reported an ACD prevalence of 20%.[31] In the hospital sector, ACD prevalence rates of 12-26% have been reported in studies in the United States.[32, 33] Apart from any actual differences between jurisdictions internationally, these varying prevalence estimates are likely to reflect a wide range of methodologies and study populations and variation in the quality of studies."*(Page 21, Paragraph 2 – Marked copy)

14. **Page 14, lines 15 to 35, The authors proposed further efforts to increase uptake of ACP in hospitals and general practices, and to understand barriers against ACP promotion. Subsequently, they described universal strategies to promote ACP implementations. As they provided comparison of prevalence of ACP among RACF, hospitals, and general practices, this reviewer asks discussions about the reasons why lower prevalence in hospitals and very low prevalence of ACP in general practices, the analysis of setting-specific obstacles to raise prevalence of ACP, and specific schemes to promote ACP implementation at each setting from the authors' observations at this time, not future perspective, which was described at Page 16, lines 5 to 10. Even provisional discussions are acceptable.**

As suggested, we have revised this section to include discussion on the specific obstacles to ACD completion and potential strategies to promote ACD completion in each setting:

*"People in residential aged care facilities were significantly more likely to have an ACD than people in hospitals or attending general practice. As providers of care to one-third of people approaching the end of life, residential aged care facilities play a vital role in facilitating ACP and enacting ACDs where they exist.[23, 45] The lower prevalence in hospitals and very low prevalence in general practices suggests that further efforts are needed to increase uptake of ACP in these settings, and to understand barriers to this occurring.*

*It is estimated that approximately 30% of people admitted to hospitals are likely to be in their last year of life,[46] highlighting the important role hospitals have in supporting people to participate in ACP and to develop, review, update or enact ACDs.[3, 47] However, research suggests that inadequate systems, support structures and ACP training for clinicians in hospitals can lead to a reluctance to have conversations and develop ACDs.[23, 48, 49] Addressing these barriers would be beneficial to increasing uptake in the hospital sector.*

*In addition, while general practitioners are well placed to hold ACP conversations given their often longstanding and trusted relationships with patients,[47, 50] ACP conversations require time and effort, and in most circumstances, cannot be completed on a single visit. The pressure of managing conflicting patient and clinician priorities within short appointments and the absence of suitable remuneration can discourage primary care providers from dedicating time to ACP.[47] Increasing ACP in primary care could be supported through the inclusion of ACP into*

*routine health assessments, utilising a multidisciplinary approach and utilising funding for regular consultations to facilitate remuneration for the time required.[23, 47, 51] For the true potential of ACP to be achieved across all health sectors, a system-wide and multi-faceted approach to ACP implementation is required. Key elements include increasing community awareness and uptake earlier in illness trajectories, with regular brief reviews, provision of training and support for clinicians and aged care workers, and improving storage and accessibility of ACDs at the point of care.[13, 14, 23, 24, 47, 51]" (Page 18, paragraph 2 - Page 19, paragraph 2 – marked copy)*

- 15. Page 16, lines 10, The description, “the impact of limited ACDs at the point of care on person-centered outcomes”, is a little difficult to understand for this reviewer, so that this reviewer suggests to rewrite in more plain expression.**

As suggested, we have revised this sentence to read

*“Furthermore, improved understanding regarding the facilitators and barriers to ACP uptake in general practice, hospitals, and residential aged care facilities, and the potential consequences of not having an ACD available to guide medical decision-making at the point of care is necessary if the maximal value of ACP and ACDs is to be achieved.” (Page 22, Paragraph – 2 marked copy)*

**Reviewer: 3**

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- 16. In the study protocol, the study was described as consisting of two (rather: three) parts: 1) the health record audit part of health record data, allowing for the estimates of prevalence of ACP documentations and predictors for having such a document, as reported in the paper; 2) a survey on care preferences of those participants whose records were screened and 3) exploration of the consistency of medical orders and care plans with documented wishes. At least for the survey, an informed consent has to be given by the patient. As the same number of the research clinical ethics committee approval number is given for all parts of the study as for the study on ADs only I was wondering why the authors state that no IC was necessary for this study. Was the survey and medical care plan part skipped or will it be reported elsewhere? At least, information should be given regarding the fate of the other study parts reported in the published study protocol and their interconnection with each other.**

To clarify which component(s) of the parent study are reported in this manuscript and for further details regarding informed consent, we have amended the methods section as follows:

*“Data reported in this article originate from a large-scale national study examining the prevalence of ACDs in selected Australian general practices, hospitals and residential aged care facilities. The parent study involved a prospective multi-centre audit of health records and a self-report survey of a subset of people whose records were included in the audit. The study protocol has been reported elsewhere.[15] This article focuses on the audit component of the study. Data relevant to the survey and to clinical care plans will be reported elsewhere. A brief summary of the audit methodology is outlined here.*

*The study was approved by Austin Health Human Research Ethics Committee (ref: HREC/17/Austin/83) and site-specific approval was sought when required. Informed consent was obtained for the survey component of the study. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines were followed in the reporting of this cross-sectional study.[41]" (Page 7 paragraph 2 and 3 – marked copy)*

- 17. Regarding the statistical analysis, I was wondering if cluster effects and missing values are appropriately dealt with. I am not a statistician but according to my understanding, the statistical analysis should integrate possible cluster effects and deal with missing values with multiple imputation rather than list wise deletion, since data**

should be close to representativeness. As participants were collected in nursing homes, hospitals and practices, a cluster effect of the variables collected is very likely and via a listwise deletion of missing values (which are considerable regarding several variables) cases are lost and the sample less representative (and might be even more skewed/influenced by the cluster effect ).

As suggested, we attempted imputation versus listwise deletion for the logistic regression and have included the outcome in our results sections as follows:

*"To account for missing data on the ECOG variable (n = 674) we attempted multiple imputation. However, this approach was ineffective because although it boosted sample size, it also greatly increased the variance and reduced the efficiency of the model. Thus, for the purposes of the regression model, the 674 participants with missing data on the ECOG variable (29.6% of the total population) were removed using listwise deletion."*(Page 16, Paragraph 1 – marked copy).

# 18. Should the sample not be compared to national Australian statistics of people over 65 to discuss representativeness?

As suggested, we have revised our methods, results and discussion sections to compare our sample to national representativeness.

Firstly, we developed a revised model weighted by age, gender and jurisdiction of the Australian population. This is described in revised methods section as follows:

*"In a supplementary logistic regression analysis, data were weighted for age, gender and jurisdiction to compensate for under-representation from the younger (65-75 years) cohort and over-representation from females and people living in Victoria. Weighting was conducted using the latest Australian Bureau of Statistics Data.[43] To account for variables with low cell counts in the weighted analysis, 10 people who were of indigenous background and aged less than 65 years were excluded and the three smallest jurisdictions (Australian Capital Territory, South Australia and Tasmania) were combined."* (Page 10, Paragraph 2 – marked copy)

The findings from the weighted model are described in the results section as follows:

*"After the data were weighted for age, gender and jurisdiction, the overall prevalence of ACDs was reduced to 21.4%. Using the weighted data, the results of the multivariate logistic regression model showed that healthcare setting no longer significantly predicted the presence of an ACD in the health record. However, several other variables became significant in the weighted model: there were higher odds of having an ACD for those who were older (OR=1.03; 95%CI=1.00-1.05), those with a urinary or reproductive condition (OR=1.63; 95%CI=1.17-2.25), those with cancer (OR=1.93; 95%CI=1.29-2.87) and those rated as ECOG Grade 1 (low disability) compared to those rated as ECOG Grade 0 (OR=6.15; 95%CI=1.37-27.54). Consistent with the unweighted model, there were also higher odds of having an ACD for those who were rated as ECOG Grade 2, 3 or 4 compared to those rated as ECOG Grade 0 (OR=16.88; 95%CI=4.19-67.94, OR=19.35; 95%CI=4.80-77.97 and OR=20.60; 95%CI=5.01-84.67, respectively). Full results of the weighted model are presented in Appendix 3"*(Page 16, paragraph 3 – marked copy)

We have also given further consideration to these findings and representativeness in the discussion as follows:

*"After weighting for age, gender and jurisdiction, the overall prevalence of ACDs was reduced from 30% to 21%. The weighted model also showed greater odds of having an ACD for people who were older, people with a urinary or reproductive condition and people with cancer. The study sample was under-represented in the younger cohort (65-75 years) and over-*

represented in females and the jurisdiction of Victoria in comparison to the general Australian population, making it difficult to draw firm conclusions about the weighted analysis.[43] Nonetheless, given the weighted regression model increased the effect of the younger cohort of the sample (those aged 65-75 years) on the results, it is likely that this younger age group were more likely to have an ACD if they had a urinary/reproductive condition or cancer. Further research amongst this age cohort would help to clarify these findings.” (Page 20, paragraph 2 – marked copy)

19. The main outcome reported in this study is the prevalence of ACP documentation as a surrogate parameter for the “real” patient oriented outcome ACP outcome of goals concordant with care , as discussed in the recent Dephi studies on ACP by Rebecca Sudore and Judith Rietjens (Sudore RL, Heyland DK, Lum HD, et al. Outcomes that Define Successful Advance Care Planning: A Delphi Panel Consensus. J Pain Symptom Manage 2018; 55:245-255.doi:10.1016/j.jpainsymman.2017.08.025. The existence of an ACP document per se is only a surrogate parameter and high prevalences of ACP documentation might – in some circumstances- even be a sign of “forced” ACP, as some authors critically discuss with regard to nursing home policies. The data of the study on the survey on preferences and goals of care, as entailed in the study protocol is of course able to fill this gap, but as only the data on prevalences are reported here, its value as an ACP patient oriented outcome should be more critically discussed, also with regard to ACP documentation without any facilitation.

As suggested, we have amended the discussion as follows:

*“Given the audit methodology utilised, it is not possible to determine quality and extent of ACP conversations known to be an important determinant of a successful ACP program.[4, 5] An additional limitation of the audit methodology is that it is unknown whether the presence of any ACDs, or specific types of ACDs translates into care that is consistent with the person’s preferences, the ultimate goal of ACP.[1] Nonetheless, utilising a standardised audit methodology allows for scalable national measurement of documentation of completed ACDs, which is one key component of ACP.”* (Page 21, paragraph 3 – marked copy)

20. In general, the references and descriptions are quite exclusively reporting Australian views, not citing recent international studies on ACP in nursing homes, ACP in the US (including prevalence studies and impact on health care such as the POLST in Oregon , Tolle, Teno, . N Engl J Med. 2017 Mar 16;376(11):1078-1082. doi: 10.1056/NEJMSb1612511., ACP in General practice Meeussen K, Van den Block L, Echteld M, et al. Advance care planning in Belgium and The Netherlands: a nationwide retrospective study via sentinel networks of general practitioners. J Pain Symptom Manage 2011; 565-77 and ACP also with regard to ACP documentation in nursing homes (in der schmitt et al Implementing an advance care planning program in German nursing homes: results of an inter-regionally controlled intervention trial; Dtsch Arztebl Int 2014; 111(4): 50-7; DOI: 10.3238/arztebl.2014.0050 Gilissen J, Pivodic L, Smets T, et al. Preconditions for successful advance care planning in nursing homes: A systematic review. Int J Nurs Stud 2017; 66: 47-59 PubMed . doi: 10.1016/j.ijnurstu.2016.12.003.; PubMed As the study describes the Australian situation, this is in part appropriate of course. Yet, some statements are made as if they report worldwide views especially in the introductory part (e.g. “ACDs are written documents (...) that are completed and signed by competent adults”. Some legislations e.g. in Europe also allow completion of advance directives by competent minors or by surrogates, together with incompetent adults following the concept of assisted autonomy. The huge differentiation between non statutory and statutory documents made in the article due to the Australian situation could also be discussed more openly if world views and experiences are included which would allow for criticizing this division – as in many countries, every statement written by a patient including values, goals and medical treatment refusal and consent to treatment are legally valid, as e.g. in Germany.

Thank you for this feedback, and we agree there was a very strong focus on the Australian

situation. We have made changes in the introduction and in the discussion to take a more international perspective. Thank you for providing some references, some of which have been utilised. We recognise that oral directives are also possible under some laws, as are the option of minors completing ACDs, however it is outside of the scope of this study to discuss this in more detail. To assist in removing confusion we have clarified that the definition we are using is Australian.

The following has been added to the introduction in the revised manuscript:

*“Internationally, there is considerable variation in the terminology, documentation and legislative frameworks related to ACDs.[6-11] In Australia, an ACD is a type of document recognised by common law or statutory legislation that is completed and signed by a competent adult. It can record the person’s preferences for future care, and appoint a substitute decision-maker to make decisions about future care.[12]”* (Page 5, Paragraph 2 – Marked copy)

The following paragraph has also been added to the discussion:

*“From an international perspective, the results found in this study are comparable to a recent systematic review of 150 studies in the United States, which reported an average ACD prevalence of 36.7%.[34] However, other international ACD prevalence estimates vary. In aged care settings, prevalence rates range from 11-36% in Germany,[26, 27] to 16% in Taiwan,[28] to 59% in the United States.[29] In general practice, a prevalence of 33% was found in one European study [30] while a Canadian study reported an ACD prevalence of 20%.[31] In the hospital sector, ACD prevalence rates of 12-26% have been reported in studies in the United States.[32, 33] Apart from any actual differences between jurisdictions internationally, these varying prevalence estimates are likely to reflect a wide range of methodologies and study populations and variation in the quality of studies.”*(Page 21, Paragraph 2 – Marked copy)

## VERSION 2 – REVIEW

<b>REVIEWER</b>	Dr Maryann Street Deakin University and Eastern Health, Australia
<b>REVIEW RETURNED</b>	03-Dec-2018

<b>GENERAL COMMENTS</b>	It has been a pleasure to review this revised manuscript of the prevalence of Advance Care Directives and other Advance Care Planning documentation in Australia. The complexity of legislation in the different states and territories enhances the value of this national prospective study. The authors have addressed the comments from reviewers and the manuscript has been improved. The only suggestion I have is that 'Physician Orders for Life Sustaining Treatment' is only referred to once in the manuscript and therefore the abbreviation (POLST) is not required.
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<b>REVIEWER</b>	Kazuyoshi Senda, MD, PhD National Center for Geriatrics and Gerontology, Japan
<b>REVIEW RETURNED</b>	04-Dec-2018

<b>GENERAL COMMENTS</b>	General comments This reviewer much appreciated the chance to follow up this revised manuscript of Dr. Detering, et al, bmjopen-2018-025255.R1, which might be an international landmark article on prevalence and correlates of advance care directives (ACD) among older people from the view of this reviewer. This reviewer has checked every
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	<p>point which this reviewer suggested to rewrite in first submitted manuscript, bmjopen-2018-025255, and found that every point has been well and clearly described. This reviewer has nothing to propose to improve this manuscript now.</p> <p>The authors' considerations on higher odds of having an ACD for those who were in a residential aged care facility (RACF), and for those who people with functional impairment, are straightforward and appropriate. Reference articles in the revised manuscript were well-organized and the authors extended their discussion on the international and further implementation activities and research, so that readers other than Australians welcome this manuscript more. The revised abstract become more clearly, straightforward, and more perspicuous for even readers without abundant knowledge and experience in implementation activities and research of advance care planning (ACP) and ACD.</p> <p>This reviewer is sure that international followers refer the authors' contribution on ACD implementation as the models or benchmarks to promote ACP for sense of security of older people in the world.</p> <p>Specific comments There is No specific comment.</p>
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