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Title	Trends in site of death and healthcare utilization at the end of life: A population-based cohort study
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Reviewer 1	Christopher Doig
Institution	Department of Critical Care Medicine and Community Health Sciences, University of Calgary, Calgary, Alta.
General comments (author response in bold)	A well constructed analysis and manuscript: a pleasure to read. **Thank you.** Please consider use of medians and IQR's to describe central tendency and dispersion (unless you can explain to the reader negative values for days in the ICU or costs). **Thank you for pointing this out. We have revised the results section of the manuscript and relevant tables to reflect medians and IQRs.** I'm surprised that there are up to 10+ MD referrals for most patients, and yet, not much in the way of discussion in the interpretation section...any further thoughts (appreciating your analysis is observational)? **We have revised the discussion section to include interpretation of this finding (page 12 of the revised manuscript).** There remains a substantial proportion admitted to ICU...any assessment of temporal trend (it wasn't clear to me if you have dates of ICU admission and could link to date of death...20% admission rates may not be inappropriate if death occurred 6 months later). **In our manuscript we have elected to present temporal trends in the proportion of decedents admitted to ICU within 6-months of their date of death (Table 3). We do, however, have healthcare utilization data at closer proximity to death (30 days), which shows that approximately 13% of decedents were admitted to ICU, the rate remaining stable over the study period. We elected not to include these data given the wealth of data we have presented, in terms of comparisons across time and different subgroups.** I found the results around rural and economically disadvantaged to be more likely to die in hospital to be disconcerting and think that there should be a bit more focus in the interpretation section on this result. This is a potential important health policy issue. **We agree with the reviewer that this is an important observation and have updated the discussion section of our manuscript, highlighting the need for future research aimed at delineating the factors contributing to the observed differences (page 12 of the revised manuscript).** Despite increase in palliative care use/access, no change in costs...bit disappointing and perhaps incongruent with some benefits that enhanced palliative care offers. **We agree with the reviewer that these findings are incongruent with the notion that uptake of palliative care will result in healthcare cost savings (for example, by reducing costly acute care hospitalizations). While our data does not allow us to draw inferences regarding the potential impact of increasing palliative care use on healthcare expenditure, it is likely that factors such as the timing and type of palliative care delivered would influence this association (if any). This is an important area that requires additional research, including work that establishes whether, and which, models of palliative care service is effective in reducing health care costs at the end of life.**
Reviewer 2	Giulio DiDiodato
Institution	Department of Critical Care Medicine, Royal Victoria Regional Health Centre, Barrie, Ont.
General comments (author response in bold)	1. The authors have tackled an important and complicated subject. Variation in EOL healthcare utilization/expenditures has been described at all levels; local, regional, national and international. Less clear are the reasons for this variation, and more importantly, if this variation represents low-value care that is amenable to intervention? The authors had access to a robust database, and decided to model total variation in eol healthcare utilization as changes over time in hospital-based deaths and costs. In addition, they modelled odds of dying in hospital using a multivariable logistic regression model that included mostly patient-level variables in addition to year to account for temporality. I could not determine if the variation about the point estimates accounted for clustering by physicians, hospitals, or regions. My major criticism of this study is that the authors had access to a robust set of data that could have been modelled using a hierarchical structure, whereby the total variation that may exist could have been better described by its component parts; patient-, physician-/hospital-, and regional-level variation, in addition to temporal variation. This approach would have better informed the reader about the potential sources of variation. In addition, the recent publication in Science 2018 (file attached) that used a novel approach to understanding the reasons for the variation that exists in eol healthcare costs compromises the interpretation of this study's results that suggests that "better" eol care may reduce healthcare utilization/costs since as Einav et al. declare that "spending on the ex post dead does not mean necessarily that we spend on the ex ante "hopeless"'. **We thank the reviewer for his insightful comments regarding our regression approach and have revised our adjusted analyses as recommended. While ICES does house a rich set of administrative data, the data cut to which we currently have access precludes our ability to add all levels of hierarchy mentioned by the reviewer. Given the available data, we performed a logistic regression with random effects to account for clustering of patients within LHINs, and included a LHIN-level resource measures as a fixed effect (i.e. acute care bed capacity). Further, we accept that the lack of additional detail regarding provider- and system-level variables limits our ability to fully describe and explain determinants of in-hospital death, and have reflected this in the discussion section of the manuscript (page 10 of the revised manuscript). Notwithstanding, we feel our analyses complements and extend the current literature, highlighting opportunities for future studies. Specifically, our observation of a trend towards increased likelihood of in-hospital deaths among decedents residing in LHINs with higher number of acute care beds warrants further attention.**