Reviewer’s report

Title: Mortality following acute pancreatitis: social deprivation, hospital size and time of admission: record linkage study

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Reviewer: Camilla Nøjgaard

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Review of the manuscript:
Mortality following acute pancreatitis: social deprivation, hospital size and time of admission: record linkage study

This manuscript is a register study. The questions posed by the authors are well defined and methods are appropriate and well described. It fulfills the standards for reporting and I find the discussion and conclusions well balanced and adequately supported by the data. I think limitations of the work overall are clearly stated and acknowledgement are clearly stated. The title conveys the findings and the writing is more than acceptable.

Minor Essential Revisions:

1. Study strength and limitations:
This is a pure register study with the problems it can bring. The strength is the size of study. Unfortunately, the register lacks information about alcohol intake, tobacco use, BMI, severity of acute pancreatitis and treatment. The last is mentioned in the discussion but I would recommend that you also mention the other lack of information. I am impressed that you are able to distinguish between the different etiologies by using the DRG-codes alone. Have you validated this?

2. Deprivation:
It is surprising that social deprivation is not significantly correlated with mortality. How is the deprivation calculated exactly? Which register has been used to make this scale and how is this parameter validated? Is the parameter only based on the postcode or could you supply with information from any social registers?

3. Month of admission and recruitment of junior doctors each August
The hypothesis: "EWTD is bad for the patients and leads to a higher mortality". Do you only recruit new young doctors in August? In my country we recruit new doctors all year around so it would not be possible to test this hypothesis by comparing the different months. Could the drop in working hours per week not be a positive thing for the patient? It might lead to a more enthusiastic and awake doctor if the doctor haven't been to work 60 hours this week... You might mention this part of the discussion too in the manuscript.
You find a higher mortality for alcoholic pancreatitis in August-October. This finding does not have to be connected to the recruitment of young doctors. It could be related to, for example, a higher alcohol intake these months.

4. Analysis
In figure 3 you have not defined the red and green box-plots. Is it August?

5. Underlying cause of death
p. 10: Gallstone is stated as the cause in 13%. How can that be true?

6. Mortality according to size of hospital:
You are surprised to find a higher mortality in the largest hospitals. In my country, patients are distributed to the different hospitals by a specific pre-hospital selection. The doctor that sends the patient to the hospital sets a hypothetic diagnosis. He/she contacts a "central distribution center" and then the most ill patients with a specific diagnosis are distributed to the largest hospitals while patients less ill and with other diagnoses are sent to smaller hospitals. If this is also the case in UK, it might explain some of the results.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:
I declare that I have no competing interests.