Author’s response to reviews

Title: Characteristics and outcomes of patients with dyspnoea as the main symptom, assessed by prehospital emergency nurses- a retrospective observational study

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Author’s response to reviews:

Dear Editor and Reviewer 2,
Thank you for the valuable questions and suggestions. We have replied all of them and hope you now will find our paper more clear after the revision that have been made.

Reviewer reports:
Reviewer 1: Thank you for making extensive changes as advised to the manuscript- it is more focused now.

Reviewer 2: Thank you for the opportunity to re-review this paper, it has improved considerably. The aims are now clearly focused on final diagnoses and outcomes.

The study contributes to the scarce knowledge of breathing problems among EMS patients. I still have a few comments and suggestions.

1) The focus is on diagnoses and outcomes. However, there are large proportion of missing diagnosis in 1030 patients. This needs to be presented and discussed as a limitation. Were those left-on-scene included here, or?

Reply: Thank You for this important comment. In the following groups of patients there was missing information on the final diagnosis: 1) Among patients left on scene there was no information on final diagnosis; Among patients who were brought to hospital and directly sent
home from the Emergency Department a proportion a proportion were never assessed by a phycisian and were therefor not given a final diagnosis. Information is added on page 14, line 325-329.

2) The study also presents data on the patients' symptoms and signs condition at the scene: pain scores, vital signs and even ECG (rather detailed) and blood-glucose, the latter two should be reflected in the final diagnoses. This might be shortened (the cardiologist in the group might disagree :-) - or please explain the importance in the paper.

Reply: Thank You for this comment. We think it is important to describe the clinical findings in the prehospital assessment as carefully as possible. Some ECG parameters may be reflected in the final diagnosis. For example among patients with ST elevation on admission ECG a majority will most likely have a final diagnosis of myocardial infarction. But we think is important to describe the proportion of patients with dyspnea in whom the ECG raises a suspicion of a cardiac etiology already in the prehospital setting regardless of the final outcome. Similarly an elevation of blood glucose may raise a suspicion of a time sensitive condition which is not always linked to diabetes. We have added a further comment on Page 5 ,line 108.

3) The previous history (table 1) was based on the ICD-diagnoses, according to the methods, and I wonder what ICD-diagnosis 'dyspnea' refers to? From chapter 18 or 21? Also I wonder, why the major frequency of pulmonary disease is not mentioned.

Reply: Thank you for your questions. The ICD- Diagnosis “dyspnoea” (R060) refers from chapter 18 (Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified). We have also added information regarding the frequency of pulmonary disease in the result, Page 8, Line 176.

4) Thank you for the explanation of the definition of 'time-critical' diagnoses. As the focus is on etiology as shown by final diagnoses, I guess the reader will be curious to get more details on all the main critical diagnoses found among these patients - and maybe also among those dying within 30 days. Especially as the critical diagnoses constitute 11% and it turned out - by chance - that 30-day mortality was 11%.

Reply: Thank you for your comment. Information is added among both the three most common final diagnosis and the three most common time-critical diagnoses in patients dying within 30 days on Page 10, line 213-217.

After combining all different ICD-10 codes, instead we found that the most common time critical conditions were among cardiovascular disease followed by Pulmonary disease and Infection. We
have thus made a mistake when not looking at all ICD-10 codes and have now corrected the text on Page 9, line 205.

This is my first paper included in my thesis, where this paper is more generally described. Our upcoming paper is specifically focusing on Time-critical conditions. Also differences between women and men with time-critical conditions will be discussed in more detail in the upcoming paper.

5) The paper consequently analyses the sex-differences, with OR for men (compared to women? Or to all patients?) in the tables and separate survival curves for men and women. Was this part of the aim? The differences are only commented very briefly, and not used to analyze whether these differences in disease patterns are associated with the different outcome?

Reply: Thank you for your questions. The aim was to describe the characteristics and outcome among patient with dyspnea overall and in relation to sex. Information is added on Page 4, line 70. We added information on the proportion of women and men who had a time critical condition and related this figure to their 30 day mortality rate on Page 9, line 207.

6) I am not an expert in statistics, but I wonder why the authors in the survival analyses chose randomly among the patients with several events during the study period, instead of using time from last event?

Reply: Regarding randomly choosing an event in the survival analysis. Among patients with multiple events several models have been proposed but it is not fully clear which model to use and when. They also require that several assumptions are met and are quite complicated (Amorim et al. 2015). Furthermore, if selecting a single timed event whether first or last there is a risk of selection bias. Since the unique individuals were selected beforehand this was done randomly in order to minimize selection bias. Patients with an event of severity may later on have another call for ambulance and remain on scene. This may lead to an overestimation that patients die within a specified time due to remaining on-scene if this would be overrepresented as last occurrence.