

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Incidence of occupational injuries and diseases among seafarers: a descriptive epidemiological study based on contacts from onboard ships to the Italian Telemedical Maritime Assistance service in Rome, Italy
AUTHORS	Sagaro, Getu Gamo; Dicanio, Marzio; Battineni, Gopi; Samad, Marc; Amenta, Francesco

VERSION 1 – REVIEW

REVIEWER	William Pickett, with input (with journal permission) from laboratory members: N Fynn-Sackey, R Boyes, P Norman, J Shellenberger, L Cramm, R Miller Queen's University Canada
REVIEW RETURNED	08-Oct-2020

GENERAL COMMENTS	<p>Thank you for the opportunity to review this original contribution to BMJ Open.</p> <p>The authors make a reasonable case that there is a need for data describing the health, illness, and injury experiences of workers who are employed on ships and vessels as a foundation for prevention initiatives. It is clear that their analysis is novel and addresses a topic that has been overlooked and is of potential importance.</p> <p>There were a number of issues that arose upon review, and could be revisited in a revision of this manuscript.</p> <p>Issue 1. Incidence rate estimation. Rates of disease occurrence and injury occurrence were based upon medical records compiled administratively, and denominator data that were estimated based on average numbers of workers on vessels. It would be helpful to have further discussion of: (1) the completeness and validity/reliability of the illness and injury records; (2) the accuracy of the denominator information and a clear description of how it was compiled; (3) the strengths and limitations of the data that were used, as applied to incidence rate estimation and relative risk estimation.</p> <p>Issue 2. Study rationale. The study rationale that is currently provided is quite short and lacking in detail. While it is obvious that some initial epidemiological analyses of this sort that describe rates and patterns of illness and injury might be foundational and helpful, it would be helpful to have more information on how such data might be applied to the formation of prevention initiatives,</p>
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	<p>whether they are policy or health promotion or clinically oriented. This aspect of the study write-up lacked necessary detail.</p> <p>Issue 3. Potential explanations for observed associations. A great number of comparisons were made in this manuscript, with resulting estimations of relative risks (IRR) of various illness and injury outcomes in different groups. (A minor point ... these measures of effect are described as risk differences, which they are not). While a simple descriptive analysis that identifies such associations is of value, it is difficult to develop anything reasonable in the way of suggestions for prevention without having a full sense of the factors that underlie such associations. There is no effort here to control for potential confounders that might explain the observed effects, nor any effort to describe other factors that might mediate associations between the various administrative exposures and the illness/injury outcomes. At a minimum, more discussion of this is required. Beyond that, the authors may consider the need for accounting for other factors and mechanisms that are responsible for the observed effects in a revised analysis. Because of these omissions, the results leave more questions than answers about these associations and the study findings. The nature of the findings available prevents any meaningful analytical conclusions from being formed, which makes it difficult to take these findings and turn them into preventive recommendations.</p> <p>Issue 4. Provision of an evidence based for study conclusions and recommendations. This is clearly a descriptive study. The conclusions and recommendations made by the authors go far beyond the level of evidence generated by the analysis. In the absence of analytical findings that get at the causes of the observed effects, and trial and other evidence from controlled studies that support such recommendations, these ideas are probably inappropriate at this stage of enquiry.</p> <p>Issue 5. Writing and format. The article as currently written is plagued by typographical, grammatical and formatting errors. A good edit would be helpful.</p>
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REVIEWER	Kimmo Herttua Centre of Maritime Health and Society, Department of Public Health, University of Southern Denmark, Denmark
REVIEW RETURNED	22-Oct-2020

GENERAL COMMENTS	<p>This study addresses an important topic, injuries and diseases among seafarers, and explores the incidence of these outcomes across rank and worksite on board. I hope my comments will help the authors to further improve their paper to get it ready for publication.</p> <p>1. My major concern relates to methodology. Used statistical methods are quite simple and do not address the potential associations between seafarer rank, worksite, etc. and health outcomes. Modern multi-variate regression analyses would give much more accurate picture of the associations. For example, do deck workers have higher risk for cardiovascular diseases than engine workers only because they are older? So, more advanced statistical methods should be used to avoid these kinds of pitfalls.</p> <p>2. Another methodological concern relates to the population at risk. If I understood correctly, the population at risk used was all seafarers in the Italian fleet. If it is the case, I need to ask, why all</p>
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	<p>seafarers from the same company (CMA CGM), from which the outcomes are derived were not used as the population at risk? This would also apparently allow using age and other important covariates in analyses.</p> <p>3. Discussion chapter needs revising and restructuring. The current version is not fully logical. For example, in the first paragraph of discussion (p. 12), the authors write about musculoskeletal and cardiovascular disorders, and then explain that “This might be related to the lack of fresh food in the diet of seafarers, poor hygiene, and problems in food handling that may increase the risk of digestive system diseases.”</p> <p>Another example in page 13, the authors are describing seafarers’ work-related stressors and diseases they are related to, but suddenly the authors jump into comparisons “Similar findings were reported in a Japanese study...”, which does not seem to relate to work-related stressors and diseases.</p> <p>Minor comments</p> <p>4. The title of the study does not really reflect the content of the paper. Using the word “epidemiology of occupational...” gives an impression that this study provides a comprehensive review on epidemiology of the outcome. This needs to be revised.</p> <p>5. The methods in the abstract contains a detailed description of tests, p-value and software used which should not be there.</p> <p>6. Table 1. A column on characteristics for non-cases should be included in the table.</p> <p>7. Results section. Decimals in percentages are unnecessary.</p> <p>8. Table 3. A title is missing in this table.</p> <p>9. In the tables 2-4, some outcome categories with few cases could be combined to make tables more readable.</p> <p>10. P.13, from line 27. Deck workers seem to have higher risk for certain outcomes. The authors are describing potential risk factors for these outcomes. Yet it is necessary to discuss, whether there are differences in these risk factors between deck workers and engine workers.</p> <p>11. P.13, from line 55. The authors report that injuries occurred more often in younger seafarers. I can see that the number of events is highest among the youngest (Table 1), but one cannot conclude they have higher risk when their number in population at risk is unknown.</p> <p>12. In page 15 starting from line 25, the authors compare injury rates of deck workers with engine and galley workers. This is conflicting with findings from a Danish study (line 31). Conflicting results need to be discussed.</p>
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REVIEWER	Eva Andersson Occupational and Environmental Medicine Sahlgrenska University hospital and Academy Sweden
REVIEW RETURNED	28-Oct-2020

GENERAL COMMENTS	<p>Review: Epidemiology of occupational injuries and diseases among seafarers: Implications for prevention.</p> <p>This study about diseases and injuries during work onboard among seafarers 2016-2019 is an important contribution to our knowledge about how recent working conditions for seafarers affect their health. The authors had taken advantage of a possibility to estimate real incidence as they can do a good</p>
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	<p>estimation of time at sea. But the paper needs some more preparation.</p> <p>General comments: The study was made only on container ships and may not be valid for all kinds of ships, although the main findings probably are so. It would be good to discuss that in the discussion and in the abstract just mention that the study was performed on container ships. Another thing to keep in mind and clarify in results and discussion is that the rate and risk measured are diseases and injuries during work onboard that needed contact with TMAS. Other diseases and injuries are not measured and especially work related diseases can occur on time not onboard. That should be added to the discussion.</p> <p>The word difference cannot be used as everyday language in an epidemiological paper. The term risk (or rate) difference means the absolute effect of an exposure, the risk for one group subtracted from the other, a good measure but not so often used (Rothman, Epidemiology – an introduction, second edition 2012, p 58-61). The authors have not calculated the risk difference but the more commonly used relative risk, here incidence rate ratio, which is good. But it can't be named difference! Therefore, the word differences in abstract, methods and tables and so forth has to be changed.</p> <p>The authors have to check how they cite their references, it is not possible to go through everything as a reviewer, but there is a list from the introduction further down that has to be changed. Also some of the references are quite old and for some of them there are updated ones that should also be considered. As an example ref 8 is reporting from the time 1986-1998, there is another paper that updates this and cover the time 1986-2009 published 2012. This study monitor the time 2016-19. Among the references there are also some very old studies about stress related diseases (a review from 1976, a study from 1979), as well as for long working hours (1997). Further ref 28, 29 about mechanisms are from 1993 and 1991. If left they should be followed by newer reviews, stress is an area with many studies and reviews. Shift work studies can also be considered for cardiovascular disease among seafarers.</p> <p>For especially injuries there are power problems, it seems that IRR was counted even if there only is one or two cases. Some use the rule to have at least three cases before analysis of risk. We don't know how many cases there is for every rate or IRR. From the figures it is possible to calculate for every disease and injury group the numbers but the reader should not have to do that. At least the numbers should be shown there but the best would be to have the cases in the tables with IRR. The power problem should be elaborated on in the Discussion. Hopefully, the authors can update and then have more cases.</p> <p>Use similar decimal rules throughout (example from table 1, 20 and 25.9). Also use the same sign for no cases and thereby no calculations, now both 0 and -.</p> <p>The discussion section could be improved in many ways and be more concise.</p> <p>Specific comments:</p>
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	<p>Consider to change the word Epidemiology in the title to Incidence.</p> <p>Abstract: methods, the main methods incidence rate and the ratio IRR and 95% CI with abbreviations should be presented. The other tests could be omitted here as well as the software.</p> <p>Abstract: results, it would be good to clarify that the results regard time on board or during work.</p> <p>Abstract: results, do we need the p-values?</p> <p>Abstract: results, why not IRR with CI for deck workers?</p> <p>Abstract: conclusion, first sentence have to be clarified. First it is reported diseases and injuries. Higher compared to whom? Deck workers are part of non-officers. The statement, if compared with those in the study, is only correct for non-officers compared to officers for both diseases and injuries. Deck workers, see further down, have only higher disease rates and injury rates than engine workers.</p> <p>Introduction: Several references have been wrongly quoted: Ref 6 “have one in eleven chances” should be “have a one in eleven chance” Ref 7 “fatal incidence rate” should be “fatal accident rate” Ref 8 “mortality in Danish seafarers” should be “fatal occupational accidents in Danish seafarers” Ref 9 “higher risk of death” should be “higher risk of mortality due to accidents at work”</p> <p>Methods: first paragraph, CMA CGM should be introduced before using, put the sentence about CMA CGM being a shipping company before “For this particular study, ...”, and it would be great with a few words about their container ships and routes.</p> <p>Methods: second paragraph, line 5, is something missing: “due to an external cause onboard merchant seafaring occupation”?</p> <p>Methods: fifth paragraph, were all the 539 ships in duty all time all four years?</p> <p>Methods: fifth paragraph, I will suggest to move the last half of that paragraph to statistical analyses, from “Then, work site and rank specific...” and make some changes to it (and no “difference”!) Definition of seafarer-years and how they are counted could here be explained a bit more, it would also be good to present the sum of seafarer-years for each group somewhere in the paper. CI-abbreviation should be introduced. And as pointed out rate and IRR is and should be the main methods used and should be presented as such.</p> <p>Methods: do we need the p-values in tables?</p> <p>Results: first paragraph, first line, something missing, “patients have assisted”?</p> <p>Results: first paragraph, last sentence, “seven times more frequently” could not be correct as deck workers should be five times more frequent than galley workers according to methods (10 deck workers 2 galleys), please clarify.</p> <p>Results: second paragraph 3.1, first sentence about figure 1, the percent's there are not correct or the percent's in the figure are wrong, they are different.</p> <p>Results: in both 3.2 and 3.3 last sentence would be better with IRR and 95% CI than x times higher.</p> <p>Results: 3.3 first paragraph, it is not correct that deck workers have the highest total injury rate which we can see in table 4</p>
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	<p>where IRR in comparison with galley is 1.23, 95% CI 0.55-3.24 (that is, far from significant meriting the word highest). Results: 3.3 second paragraph, line2, gastrointestinal is missing.</p> <p>Discussion: first paragraph, line 3 and line 6, "overall diseases" should be "overall reported diseases"</p> <p>Discussion: first paragraph, it is concluded that diseases are more frequent than injuries, could you elaborate on this part, if important, what does that mean.</p> <p>Discussion: first paragraph, the part describing different diseases with start "The overall disease rate..." should be moved to the result section. The last sentence can be omitted or put further down when different diseases are discussed. I am not convinced that poor hygiene is related to the gastrointestinal diseases mentioned and do we know that there is poor hygiene?</p> <p>Discussion: second and third paragraph, the parts on cardiovascular diseases should be hold together, improved and condensed. Some of the references should be updated.</p> <p>Discussion: third paragraph, sentence line 4-6, ending of the sentence "than engine workers" is not in congruence with the wordings earlier in the sentence.</p> <p>Discussion: fifth paragraph, there is nothing in the paper proofing that injuries occurred more often in younger seafarers, we don't know the age of the seafarers, we only know the age of the ones injured in the register. The total injury rate is a new result and as such it should be moved to the Result section.</p> <p>Discussion: fourth paragraph, galley workers has the same rate as deck workers for dermatology, which is not mentioned or discussed (maybe very few cases).</p> <p>Discussion: fifth paragraph, line 8, something missing "These findings are agree with"?</p> <p>Discussion: fifth paragraph, line 9, the authors could not present a risk with two decimals weighting three studies together without formal calculations. Even if I was impressed that the risk given in the studies actually was nearly 1.60. I think it is enough to say that it was in agreement with those studies.</p> <p>Discussion: sixth paragraph, line 2, this is not correct, not compared to galley workers, se above.</p> <p>Discussion: strengths and limitations, line 2 "without a specific epidemiological analysis of the phenomenon" I suggest to remove this wording, it is clear without that.</p> <p>Discussion: strengths and limitations, line 3, "This study measured the incidence of disease and injury...", that is not correct, it measured the incidence of reported disease and injury to TMAS for container ships, good enough. But that should be clear and discussed as a limitation to generalising the results.</p> <p>Conclusion: line 1, see above conclusion in abstract!</p> <p>Conclusion: line 6, I suggest to change "onboard ships" to "onboard container ships"</p> <p>Conclusion: the prevention section is very general could the study results also point to something more specific?</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Issue 1. Incidence rate estimation. Rates of disease occurrence and injury occurrence were based upon medical records compiled administratively, and denominator data that were estimated based on average numbers of workers on vessels. It would be helpful to have further discussion of: (1) the completeness and validity/reliability of the illness and injury records; (2) the accuracy of the denominator information and a clear description of how it was compiled; (3) the strengths and limitations of the data that were used, as applied to incidence rate estimation and relative risk estimation.

To address these comments regarding the completeness and reliability of medical events (both injuries and illnesses), we extracted the C.I.R.M. database data, as mentioned in the methodology section. There are more than eight doctors in the C.I.R.M., and 24 hours a day, doctors are on duty seven days a week. There is a follow-up program through telemedicine (video conferencing and audio communication based on seafarers' cases). All information is recorded in the databases, including care provided to patients, patient follow-up, types of disease, anatomical location affected by the injury, and the outcome. As for the total population at risk (denominator), as mentioned in the methodology, we used the only CMA, CGM container ships as the company has a contractual agreement with CIRM for telemedicine assistance at sea, and all seafarers who are working on those ships are recorded (the number of ships per year as well as the number of crew members per ship) and consequently the healthcare services provided. Reviewer's comments are also considered in the revised version of the strengths and limitations section.

Issue 2. Study rationale. The study rationale that is currently provided is quite short and lacking in detail. While it is obvious that some initial epidemiological analyses of this sort that describe rates and patterns of illness and injury might be foundational and helpful, it would be helpful to have more information on how such data might be applied to the formation of prevention initiatives, whether they are policy or health promotion or clinically oriented. This aspect of the study write-up lacked necessary detail.

The comments and suggestions are accepted, and we have made a change in the revised version.

Issue 3. Potential explanations for observed associations. A great number of comparisons were made in this manuscript, with resulting estimations of relative risks (IRR) of various illness and injury outcomes in different groups. (A minor point ... these measures of effect are described as risk differences, which they are not). While a simple descriptive analysis that identifies such associations is of value, it is difficult to develop anything reasonable in the way of suggestions for prevention without having a full sense of the factors that underlie such associations. There is no effort here to control for potential confounders that might explain the observed effects, nor any effort to describe other factors that might mediate associations between the various administrative exposures and the illness/injury outcomes. At a minimum, more discussion of this is required. Beyond that, the authors may consider the need for accounting for other factors and mechanisms that are responsible for the observed effects in a revised analysis. Because of these omissions, the results leave more questions than answers about these associations and the study findings. The nature of the findings available prevents any meaningful analytical conclusions from being formed, which makes it difficult to take these findings and turn them into preventive recommendations.

To address these comments, our study is retrospective and limited to the variable available in the datasets. That is one of the limitations of the retrospective study, and in this regard, we have no other option to consider the covariates. However, based on the comments, we have revised our study's title to a conclusion based on our findings.

Issue 4. Provision of an evidence based for study conclusions and recommendations. This is clearly a descriptive study. The conclusions and recommendations made by the authors go far beyond the level of evidence generated by the analysis. In the absence of analytical findings that get at the

causes of the observed effects, and trial and other evidence from controlled studies that support such recommendations, these ideas are probably inappropriate at this stage of enquiry.

Comments are accepted and corrected accordingly in the revised version.

Issue 5. Writing and format. The article as currently written is plagued by typographical, grammatical and formatting errors. A good edit would be helpful.

In response to these comments, we reviewed the drafting and formatting issues and tried to address the revised version's reviewers' comments.

Reviewer 2

1. My major concern relates to methodology. Used statistical methods are quite simple and do not address the potential associations between seafarer rank, worksite, etc. and health outcomes. Modern multi-variate regression analyses would give much more accurate picture of the associations. For example, do deck workers have higher risk for cardiovascular diseases than engine workers only because they are older? So, more advanced statistical methods should be used to avoid these kinds of pitfalls.

To address these comments, we thank the reviewer for his concern, but as mentioned in the methodology section, we have done descriptive statistics, and we have no option to consider regression analysis because our study is retrospective and limited to the variables available in the dataset. As presented in Table 4 we have compared the crude rate ratio proportionally rather than adjusted for the risk measurement. Furthermore, we have mentioned some limitations of covariates in the limitation and strength section of the discussion, and that is why we have not considered the age of non-cases. However, we have made a change in the revised version of the strength and limitation section.

2. Another methodological concern relates to the population at risk. If I understood correctly, the population at risk used was all seafarers in the Italian fleet. If it is the case, I need to ask why all seafarers from the same company (CMA CGM), from which the outcomes are derived were not used as the population at risk? This would also apparently allow using age and other important covariates in analyses.

To address these comments, we did not consider the total at-risk seafarer populations of the Italian fleet, but the CMA CGM. The reason why, CMA CGM is the French shipping company and has a contractual agreement regarding telemedicine assistance on board since January 2016 with C.I.R.M and the number of crews per ship and the number of ships per year under control in C.I.R.M. Unfortunately, the age, gender and other important variables of the non-cases were not available in the database which is why our study was limited to the age and gender of the cases and the estimated number of seafarers across ranks and worksites. However, we have made a change in Table 1 data of the revised manuscript and kindly ask the reviewer to revisit our revised version.

3. Discussion chapter needs revising and restructuring. The current version is not fully logical. For example, in the first paragraph of discussion (p. 12), the authors write about musculoskeletal and cardiovascular disorders, and then explain that "This might be related to the lack of fresh food in the diet of seafarers, poor hygiene, and problems in food handling that may increase the risk of digestive system diseases." Another example in page 13, the authors are describing seafarers' work-related stressors and diseases they are related to, but suddenly the authors jump into comparisons "Similar findings were reported in a Japanese study...", which does not seem to relate to work-related stressors and diseases.

To answer these comments, in fact, in the same paragraph the line number 8, we have mentioned gastrointestinal disorders, and the potential risk factors were for the gastrointestinal disorders rather than for cardiovascular and musculoskeletal diseases. Anyway, we have made corrections in the revised version of the manuscript. Regarding page 13 comments, we thank the reviewer for his concern, and we have corrected them accordingly in the revised version.

4. The title of the study does not really reflect the content of the paper. Using the word "epidemiology of occupational..." gives an impression that this study provides a comprehensive review on epidemiology of the outcome. This needs to be revised.

The comment is accepted, and we have revised the title of the study in the revised version.

5. The methods in the abstract contains a detailed description of tests, p-value and software used which should not be there.

The comments and suggestions are accepted, and we have formatted the abstract according to the journal guideline and removed the p-value and software.

6. Table 1. A column on characteristics for non-cases should be included in the table.

We thank the reviewer for the concern, and we have made a change in Table one data in the revised version of the manuscript.

7. Results section. Decimals in percentages are unnecessary.

We have corrected it according to the reviewer's comment in the revised version.

8. Table 3. A title is missing in this table.

We have included the title of table 3 in the revised version and thanks the reviewer for the invaluable comment.

9. P.13, from line 27. Deck workers seem to have higher risk for certain outcomes. The authors are describing potential risk factors for these outcomes. Yet it is necessary to discuss, whether there are differences in these risk factors between deck workers and engine workers.

The comments are accepted, and we have revised the discussion part in the revised version of the manuscript.

10. P.13, from line 55. The authors report that injuries occurred more often in younger seafarers. I can see that the number of events is highest among the youngest (Table 1), but one cannot conclude they have higher risk when their number in population at risk is unknown.

To address this comment, we excluded only patient data from discussion, including age due to lack of this data of total seafarer population at risk and we considered data of both patients and total at risk populations in revised version under discussion section.

11. In page 15 starting from line 25, the authors compare injury rates of deck workers with engine and galley workers. This is conflicting with findings from a Danish study (line 31). Conflicting results need to be discussed.

We thank the reviewer for his invaluable comments, and we have included why our study was not in line with the study conducted on seafarers of the Danish fleet in the revised version of the manuscript.

Reviewer 3

1. The study was made only on container ships and may not be valid for all kinds of ships, although the main findings probably are so. It would be good to discuss that in the discussion and in the abstract just mention that the study was performed on container ships. Another thing to keep in mind and clarify in results and discussion is that the rate and risk measured are diseases and injuries during work onboard that needed contact with TMAS. Other diseases and injuries are not measured and especially work related diseases can occur on time not onboard. That should be added to the discussion.

To address these comments, we have revised the manuscript and considered the reviewer comments under discussion, and the strengths and limitations of the study section of the revised version.

2. The word difference cannot be used as everyday language in an epidemiological paper. The term risk (or rate) difference means the absolute effect of an exposure, the risk for one group subtracted from the other, a good measure but not so often used (Rothman, Epidemiology – an introduction, second edition 2012, p 58-61). The authors have not calculated the risk difference but the more commonly used relative risk, here incidence rate ratio, which is good. But it can't be named difference! Therefore, the word differences in abstract, methods and tables and so forth has to be changed.

We thank the reviewer for his constructive comments, and we have corrected them accordingly in the revised version.

3. The authors have to check how they cite their references, it is not possible to go through everything as a reviewer, but there is a list from the introduction further down that has to be changed. Also, some of the references are quite old and for some of them there are updated ones that should also be considered. As an example, ref 8 is reporting from the time 1986-

1998, there is another paper that updates this and cover the time 1986-2009 published 2012. This study monitors the time 2016-19. Among the references there are also some very old studies about stress related diseases (a review from 1976, a study from 1979), as well as for long working hours (1997). Further ref 28, 29 about mechanisms are from 1993 and 1991. If left they should be followed by newer reviews, stress is an area with many studies and reviews. Shift work studies can also be considered for cardiovascular disease among seafarers.

To answer these comments, first, we thank the reviewer for his concerns, and we have updated the references in the revised version.

4. For especially injuries there are power problems, it seems that IRR was counted even if there only is one or two cases. Some use the rule to have at least three cases before analysis of risk. We don't know how many cases there is for every rate or IRR. From the figures it is possible to calculate for every disease and injury group the numbers, but the reader should not have to do that. At least the numbers should be shown there but the best would be to have the cases in the tables with IRR. The power problem should be elaborated on in the Discussion. Hopefully, the authors can update and then have more cases. Use similar decimal rules throughout (example from table 1, 20 and 25.9). Also use the same sign for no cases and thereby no calculations, now both 0 and -.

We have addressed the comments in the revised version of the manuscript.

5. Consider changing the word Epidemiology in the title to Incidence.

The comment is accepted and corrected accordingly.

6. Abstract: methods, the main methods incidence rate and the ratio IRR and 95% CI with abbreviations should be presented. The other tests could be omitted here as well as the software.

Abstract: results, it would be good to clarify that the results regard time on board or during work.

Abstract: results, do we need the p-values?

Abstract: results, why not IRR with CI for deck workers?

Abstract: conclusion, first sentence have to be clarified. First it is reported diseases and injuries. Higher compared to whom? Deck workers are part of non-officers. The statement, if compared with those in the study, is only correct for non-officers compared to officers for both diseases and injuries. Deck workers, see further down, have only higher disease rates and injury rates than engine workers.

All comments regarding abstracts were edited, and made the change. Still, regarding deck workers, a comparison was made in terms of the worksite, and all deck workers are not non-officers because, in the deck job category, there are also deck officers. Regarding the classification of rank and worksite, we have clearly mentioned it under the methodology section. We thank the reviewer for understanding.

7. Introduction: Several references have been wrongly quoted:

Ref 6 "have one in eleven chances" should be "have a one in eleven chance"

Ref 7 "fatal incidence rate" should be "fatal accident rate"

Ref 8 "mortality in Danish seafarers" should be "fatal occupational accidents in Danish seafarers"

Ref 9 "higher risk of death" should be "higher risk of mortality due to accidents at work"

We thank the reviewer for his/her constructive comments, and we have corrected all points regarding the references in the revised version.

8. Methods: first paragraph, CMA CGM should be introduced before using, put the sentence about CMA CGM being a shipping company before "For this particular study, ...", and it would be great with a few words about their container ships and routes.

Methods: second paragraph, line 5, is something missing: "due to an external cause onboard merchant seafaring occupation"?

Methods: fifth paragraph, I will suggest to move the last half of that paragraph to statistical

analyses, from “Then, work site and rank specific...” and make some changes to it (and no “difference”!) Definition of seafarer-years and how they are counted could here be explained a bit more, it would also be good to present the sum of seafarer-years for each group somewhere in the paper. CI-abbreviation should be introduced. And as pointed out rate and IRR are and should be the main methods used and should be presented as such.

Methods: do we need the p-values in tables?

All comments given by the reviewer in the methodology section are considered and corrected in the revised version of the manuscript.

9. Results: first paragraph, first line, something missing, “patients have assisted”?

Results: first paragraph, last sentence, “seven times more frequently” could not be correct as deck workers should be five times more frequent than galley workers according to methods (10 deck workers 2 galleys), please clarify.

Results: second paragraph 3.1, first sentence about figure 1, the percent's there are not correct or the percent's in the figure are wrong, they are different.

Results: in both 3.2 and 3.3 last sentence would be better with IRR and 95% CI than x times higher.

Results: 3.3 first paragraph, it is not correct that deck workers have the highest total injury rate which we can see in table 4 where IRR in comparison with galley is 1.23, 95% CI 0.55-3.24 (that is, far from significant meriting the word highest).

Results: 3.3 second paragraph, line2, gastrointestinal is missing.

We have made the change to the result part and kindly ask the reviewer to revisit the manuscript's revised version.

10. Discussion: first paragraph, line 3 and line 6, “overall diseases” should be “overall reported diseases”

Discussion: first paragraph, it is concluded that diseases are more frequent than injuries, could you elaborate on this part, if important, what does that mean.

Discussion: first paragraph, the part describing different diseases with start “The overall disease rate...” should be moved to the result section. The last sentence can be omitted or put further down when different diseases are discussed. I am not convinced that poor hygiene is related to the gastrointestinal diseases mentioned and do we know that there is poor hygiene?

Discussion: second and third paragraph, the parts on cardiovascular diseases should be hold together, improved and condensed. Some of the references should be updated.

Discussion: third paragraph, sentence line 4-6, ending of the sentence “than engine workers” is not in congruence with the wordings earlier in the sentence.

Discussion: fifth paragraph, there is nothing in the paper proofing that injuries occurred more often in younger seafarers, we don't know the age of the seafarers, we only know the age of the ones injured in the register. The total injury rate is a new result and as such it should be moved to the Result section.

Discussion: fourth paragraph, galley workers has the same rate as deck workers for dermatology, which is not mentioned or discussed (maybe very few cases).

Discussion: fifth paragraph, line 8, something missing “These findings are agree with”?

Discussion: fifth paragraph, line 9, the authors could not present a risk with two decimals weighting three studies together without formal calculations. Even if I was impressed that the risk given in the studies actually was nearly 1.60. I think it is enough to say that it was in agreement with those studies.

Discussion: sixth paragraph, line 2, this is not correct, not compared to galley workers, se above.

Discussion: strengths and limitations, line 2 “without a specific epidemiological analysis of the phenomenon” I suggest to remove this wording, it is clear without that.

Discussion: strengths and limitations, line 3, “This study measured the incidence of disease and injury...”, that is not correct, it measured the incidence of reported disease and injury to

TMAS for container ships, good enough. But that should be clear and discussed as a limitation to generalizing the results.

All comments provided by the reviewer in the discussion chapter are addressed in the revised version of the manuscript. We thank the reviewer for reading and providing constructive comments to improve our revised manuscript.

11. Conclusion: line 1, see above conclusion in abstract!

Conclusion: line 6, I suggest changing “onboard ships” to “onboard container ships”

Conclusion: the prevention section is very general could the study results also point to something more specific?

We have addressed the comments in the revised version.

VERSION 2 – REVIEW

REVIEWER	William Pickett Brock University, Canada
REVIEW RETURNED	08-Dec-2020

GENERAL COMMENTS	<p>Thank you for the opportunity to review this re-submission. I was reviewer 1 in the original review. I will (mainly) limit my comments to the points raised upon initial review.</p> <p>I appreciated the additional detail provided about the approach to disease surveillance as well as the estimation of denominator data. It is probably impossible to quantify the reliability of this process, but the process is now clearly described and I accept that these data are very likely thoroughly and accurately collected.</p> <p>I appreciated the revised study rationale, and the steps taken to not go beyond the data and research opportunity in making conclusions from the analysis.</p> <p>The quality of writing is very good, although there are a few typos and grammatical errors still, and I assume they will be corrected at the editorial level.</p> <p>The issue of missing confounders remains. There is nothing that the authors could do about this, and they have re-framed this article as being purely descriptive. I accept these decisions.</p> <p>I did have a few comments about the tables. In Table 1, there is missing information on the "galley" positions ... and I am not sure why. Further, I believe that the table (and subsequent tables) violate BMJ policies about the need to report exact p-values where they are available. In addition, the authors clearly have the ability to estimate confidence intervals around rates, and some of the tables are missing these (they would be helpful). But overall, the tables are clear and helpful.</p> <p>I wish the authors well in any final revisions.</p>
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REVIEWER	Kimmo Herttua University of Southern Denmark, Denmark
REVIEW RETURNED	18-Dec-2020

GENERAL COMMENTS	The revision was responsive to the prior review. There are still unnecessary decimals in percentages throughout the manuscript, though. These should be corrected.
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REVIEWER	Eva Andersson Occupational and Environmental medicine Sahlgrenska University hospital and Academy Sweden
REVIEW RETURNED	20-Dec-2020

GENERAL COMMENTS	<p>The manuscript is surely improved due to the three reviewer's thoroughly work. But the authors should be more respectful to the reviewer's time. Most of the answers are general; yes we have done, but not how or where. Several comments are answered in one general answer. Many changes to the manuscript are unmarked. Some comments are even omitted from their answer. So the reviewer has to go through everything to try to find out what have been changed and what not. If they had answered the comments one by one maybe they also had made the changes they say that they have done. It is not to be mean, I would like to help the authors to get this paper published.</p> <p>General comments: I will mainly comment on my earlier comments, I refer to the marked copy. The reference list is accordingly updated. Table 1 is replaced and is now a lot more informative.</p> <p>The authors say that they have addressed this, my general comment, but I can't find anything of that (the numbers in new table 1 is comparable with numbers given in old table 1): "For especially injuries there are power problems, it seems that IRR was counted even if there only is one or two cases. Some use the rule to have at least three cases before analysis of risk. We don't know how many cases there is for every rate or IRR. From the figures it is possible to calculate for every disease and injury group the numbers (new clarification: for the whole study not for rank and worksite) but the reader should not have to do that. At least the numbers should be shown there but the best would be to have the cases in the tables with IRR. The power problem should be elaborated on in the Discussion."</p> <p>Specific comments:</p> <p>Abstract: Objectives, line 4, "illnesses" should be diseases as that is what is studied in this study. Illness or disease is not the same, if illness is the preferred that should be used consistently instead of disease. Oversimplified you could say that illness is what you feel and disease what is diagnosed. Disease/disorder can be used. But illness could be used first line if that is what is thought of. (Of course when citing someone else's work, as in the Discussion, you have to use their reported term). Reflect on what is best 3rd line in conclusions.</p> <p>Introduction. Last paragraph, line 3, "illnesses" should be diseases.</p> <p>Methods. Second paragraph, line 1, "illnesses" should be diseases or omitted.</p> <p>-This my comment was omitted in the authors response letter:</p> <p>Methods: fifth paragraph, were all the 539 ships in duty all time all four years?</p> <p>-There is no longer any heading statistical analyses, is that ok?</p> <p>-fifth paragraph, line 5, IR should be introduced here.</p> <p>- fifth paragraph, consider if the sentence starting on line 12 is accurate since table 1 is changed.</p> <p>Results.</p>
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	<p>In first paragraph, second half, new text I suggest to delete: "Injury and disease incidence rates for non-officer and officer were significantly differed, as shown in Table 1. In column 5 of Table 1, we reported only the incidence rate ratios that were statistically significant ($p < 0.05$)."</p> <p>First sentence I understand as injury and disease IR differed which is not analysed and not really of interest, and that non-officers have a higher risk is presented in the sentence after these two. The sentence about column 5 can be a note to the table or maybe moved to the Methods section. Below table 1 first line, this could be a proper way to use illnesses. Disease is the cause of illness!</p> <p>The wrong percentages that I noted in the second paragraph are corrected but not marked. Although the authors answer reviewer 2 that they have corrected, when asked to take away decimals in percentages, the decimals were only removed in one out of 8 cases.</p> <p>In the second part (rank-specific), the first paragraph is totally changed but not marked. First line and in table 2 it states $IR=3.1$, there should be two decimals as all other IRs have that. As noted above IR should be introduced in the methods. But further down IRR are presented here which it not should be, that has already properly been done in Methods.</p> <p>In the third part (worksite-specific), both first and second paragraph also is totally changed/new but not marked. First line "illnesses" should be diseases as noted above. For table title 2-4 (and headings?) it would be better to be consistent with "diseases and occupational injuries" as diseases are first and injuries below. Discussion. I think there are too much re-reporting of results, but I leave that to the editor. The discussion is still jumping from one outcome to another and then back again as well as from one risk factor to another, choose either of them and be more structured and concise.</p> <p>It is not discussed that the two ways to divide the data are crossing each other, the officers are part of deck workers and engine workers, and when trying to find explanations for the results that becomes problematic.</p> <p>The new text in the first paragraph from second line there and marked in yellow is very good information but should be moved to the Methods section, maybe something short here like "from the TMAS database". But the first "illness" there should be disease.</p> <p>Next yellow-marked part, be consistent with decimals in percentages, at least those from this study. Does the US study use the term pathologies?</p> <p>What is the rationale behind this sentence about gastrointestinal disorders with no reference: "This might be related to the lack of fresh food in seafarers' diet and problems in food handling that may increase the risk of digestive system diseases."?</p> <p>The third paragraph is confusing; maybe there are different kinds of work stressors. Maybe start with the last part of the paragraph; In general ... and so on, and then try to differ between non-officers and officers.</p> <p>There is no change done (in answer to my comment) to this sentence that not make sense: "Cardiovascular pathologies might be due to work-related stress because deck workers have HIGH work-related stress due to sleep interruption, high job demands, night shift work, and intense activity THAN engine workers." Maybe higher would do, but better to also change word order. Reconsider the use of the word pathologies.</p> <p>No answer on this my comment: "Discussion: fourth paragraph, galley workers has the same rate as deck workers for</p>
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	<p>dermatology, which is not mentioned or discussed (maybe very few cases)." I will then further elaborate, if not understood. Now last in paragraph four: The authors only mention deck crews but not galley workers, why?</p> <p>The answer on this my comment seems to be including IR: "sixth paragraph, line 2, this is not correct, not compared to galley workers." The changed, but unmarked sentence, now: "The present study has shown that the deck workers had higher rates of overall reported injuries (IR = 8.69) compared to the engine (IR = 4.35) and galley (IR = 7.07) workers" is still not true. Galley workers are not different from deck workers, IRR in comparison with galley is 1.23, 95% CI 0.55-3.24 (that is, far from significant meriting the word higher).</p> <p>Although these missing answers, the authors tell that all comments are addressed in the Discussion.</p> <p>This sentence was right in the first manuscript but not now: "deck workers had a relatively LOW risk for injuries THAN machine (engine) workers."</p> <p>Strengths and limitations: Reconsider using the term pathologies in the second line.</p> <p>Conclusion. It should be mentioned that the results are during work onboard container ships. Also first line, "Non-officers had significantly higher rates" compared to whom? Third line, "Deck workers had significantly higher rates" compared to whom? Neither of disorder IRs listed here are higher than those of galley workers. Line 6, it is not clear what is meant: "Overall injury and disease rates for non-officers and officers significantly differed. The same is true between deck workers and engine workers."</p>
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VERSION 2 – AUTHOR RESPONSE

Reviewer #1

1. "I appreciated the additional detail provided about the approach to disease surveillance as well as the estimation of denominator data. It is probably impossible to quantify the reliability of this process, but the process is now clearly described, and I accept that these data are very likely thoroughly and accurately collected. I appreciated the revised study rationale, and the steps taken to not go beyond the data and research opportunity in making conclusions from the analysis. The quality of writing is very good, although there are a few typos and grammatical errors still, and I assume they will be corrected at the editorial level. The issue of missing confounders remains. There is nothing that the authors could do about this, and they have reframed this article as being purely descriptive. I accept these decisions."

We thank the reviewer for positive feedback and acceptance of our first round revision.

Regarding typos and grammatical errors, we have tried to correct in the revised version that we are re-submitting for review.

2. "I did have a few comments about the tables. In Table 1, there is missing information on the "galley" positions ... and I am not sure why. Further, I believe that the table (and subsequent tables) violate BMJ policies about the need to report exact p-values where they are available. In addition, the authors clearly have the ability to estimate confidence intervals around rates,

and some of the tables are missing these (they would be helpful). But overall, the tables are clear and helpful.”

To address these comments, regarding galley as we mentioned under result section page 7, above Table 1 in first round revised version, we reported only IRR with significant at p-value less than 0.05 results, but we have made a comparison for all variables in Table 1 such as non-officer vs. Officer, deck vs. engine, deck vs. galley and engine vs. galley. Accordingly, the non-officer vs. officer and deck vs. engine were statistically significant, but deck vs. galley and engine vs. galley were not statistically significant; for further information, the comparison indicated in the footnote in Table 1 of revised version. Therefore, we have not reported their result in table 1. Regarding the confidence interval (CI) around the rates, we have made changes and included the 95% CI around rates in table 1 in the second round revised version. As for the exact p-value, we have submitted the exact p-value initially or during our first submission (Table 2). However, based on the reviewer's comment, we omitted it and did not include it in the first revised version. We have now included the exact p-value in all tables of the revised version of the manuscript that we are resubmitting for review. We kindly ask the reviewer to visit the revised version again for more information.

Reviewer #2

1. “The revision was responsive to the prior review. There are still unnecessary decimals in percentages throughout the manuscript, though. These should be corrected.” We thank the reviewer for his valuable comments and suggestions, which helped us greatly in improving our first revised and resubmitted version. In addition, we warmly thank the reviewer for his positive feedback and for accepting our revised version of the manuscript. As for unnecessary decimals in percentages, on page 8, below the Table 1 decimals removed from the percentages in revised version. IR and IRR results throughout the manuscript reported with two decimals digit and results with one and three decimals digits edited to two decimals in the revised version of manuscript that we are re-submitting for review. However, only the p-value is reported with three decimal digits because the BMJ open authors guideline recommends reporting the exact p-value with 95% CI. We warmly thank the reviewer for his understanding on this matter.

Reviewer #3

Dear reviewer, we thank you for the detailed review and your valuable comments and suggestions, which helped us improve the revised version that we re-submitted for review in the first round. We have great respect for each of the reviewers' comments and suggestions, and we have responded to their comments accordingly. We apologize for the unmarked response and omitted comment. Please find below our response to each of your comments and suggestions.

1. “For especially injuries there are power problems, it seems that IRR was counted even if there only is one or two cases. Some use the rule to have at least three cases before analysis of risk. We don't know how many cases there is for every rate or IRR. From the figures it is possible to calculate for every disease and injury group the numbers (new clarification: for the whole study not for rank and worksite) but the reader should not have to do that. At least the numbers should be shown there but the best would be to have the cases in the tables with IRR. The power problem should be elaborated on in the Discussion.”

To address these comments, we have included the number of cases for every rate for each group of injuries and diseases in the tables. As for the cases in figures, from Figure 1, we can

calculate the total number of cases reported with each type of disease (both known and unknown). Figure 2 shows the total number of injured cases by anatomical location (both known and unknown). As we mentioned in the result section page 7, line 3, 11% of the total number of patients with diseases and 8% of injured patients were unknown as to rank and place of work. In other words, the number of cases in the figures and in the tables is not equal because the number of cases in the tables is only known cases to rank and place of work. We clearly mentioned in the Methods section how we calculated both IR and IRR, especially in fifth paragraph on proportional adjustment. Hence, we determined the incidence rates for 379 known cases as to rank and worksite(78 cases of injuries and 301 cases with diseases) and the number of cases for every rate for each injury and disease group included in Table 1, Table 2, and Table 3 of the revised version of the manuscript that we are resubmitting for review second round. For Table 4, it is not necessary to include the number of cases because it is already included in Table 3. As for the power problem, of course, we have calculated the rates for 1 or 2 cases as presented in the tables of the revised version, but we have determined the IRR from the incidence rates as mentioned in the footnote below table 1 and from the methods rather than directly from the number of cases. That is why we did not show the number of cases with IRR in the tables rather than with rates. Besides, we added one more column with p-value in the tables because the BMJ open authors guideline recommends reporting the exact p-value with 95% CI. In general, we thank the reviewer for her concern on this matter and kindly ask the reviewer to re-visit revised version for more information.

2. "Abstract: Objectives, line 4, "illnesses" should be diseases as that is what is studied in this study. Illness or disease is not the same, if illness is the preferred that should be used consistently instead of disease. Oversimplified you could say that illness is what you feel and disease what is diagnosed. Disease/disorder can be used. But illness could be used first line if that is what is thought of. (Of course, when citing someone else's work, as in the Discussion, you have to use their reported term). Reflect on what is best 3rd line in conclusions."
We thank the reviewer for detailed explanations and have made changes accordingly.
3. "Introduction. Last paragraph, line 3, "illnesses" should be diseases." The comment is accepted and corrected accordingly.
4. "Methods. Second paragraph, line 1, "illnesses" should be diseases or omitted." We have made change in the revised version of the manuscript accordingly.
5. "Methods: fifth paragraph, were all the 539 ships in duty all time all four years?" To address this question, 539 ships were overall active and on duty over 4 years, but this did not mean that 539 ships were on duty each year. That is why we have determined the estimated cumulative incidence rate rather than the actual incidence rate. We warmly thank the reviewer for her understanding on this matter.
6. "There is no longer any heading statistical analyses, is that ok?"
We thank the reviewer and have included statistical analysis as a subtitle in the revised version of the manuscript. We also considered the reviewer's first-round comments on the statistical analysis under methods.
7. "Fifth paragraph, line 5, IR should be introduced here. Fifth paragraph, consider if the sentence starting on line 12 is accurate since table 1 is changed."
Comments are accepted, and IR is introduced under Statistical Analysis subtitle, line 6, and the sentences regarding descriptive statistics are also edited under Statistical Analysis, line 1.

8. "In first paragraph, second half, new text I suggest to delete: "Injury and disease incidence rates for non-officer and officer were significantly differed, as shown in Table 1. In column 5 of Table 1, we reported only the incidence rate ratios that were statistically significant ($p < 0.05$)." First sentence I understand as injury and disease IR differed which is not analyzed and not really of interest, and that non-officers have a higher risk is presented in the sentence after these two. The sentence about column 5 can be a note to the table or maybe moved to the Methods section."

To address these comments, the first sentence, "Injury and disease incidence rates for non-officer and officer were significantly differed, as shown in Table 1," is removed from the paragraph, and the second sentence about column 5 is noted under Table 1 in the revised version of the manuscript.

9. "The wrong percentages that I noted in the second paragraph are corrected but not marked. Although the authors answer reviewer 2 that they have corrected, when asked to take away decimals in percentages, the decimals were only removed in one out of 8 cases."

First, we apologize for the unmarked response, and we have edited unnecessary decimals in percentages of narrative analysis on page 8 below table 1 and from both Figure 1 and figure 2.

10. "In the second part (rank-specific), the first paragraph is totally changed but not marked. First line and in table 2 it states $IR=3.1$, there should be two decimals as all other IRs have that. As noted above IR should be introduced in the methods. But further down IRR are presented here which it should not be, that has already properly been done in Methods."

We apologize for unmarked change and have marked the change in the revised version. IR is also introduced in the methods and the IR result with one decimal is changed to two decimals in the revised version of the manuscript that we are resubmitting for review.

11. "In the third part (worksite-specific), both first and second paragraph also is totally changed/new but not marked. First line "illnesses" should be diseases as noted above. For table title 2-4 (and headings?) it would be better to be consistent with "diseases and occupational injuries" as diseases are first and injuries below."

The unmarked changes during the first round review, now marked in the revised version and the word "illnesses" has been changed to diseases. The header of the tables has also been corrected accordingly.

12. "Discussion. I think there are too much re-reporting of results, but I leave that to the editor. The discussion is still jumping from one outcome to another and then back again as well as from one risk factor to another, choose either of them and be more structured and concise."

To address these comments, the points that need to be corrected are not specifically mentioned on this matter rather than in general. Anyway, we have tried to reorganize some parts in discussion and highlighted the correction. We kindly ask the reviewer to visit again the revised version for more information.

13. "It is not discussed that the two ways to divide the data are crossing each other, the officers are part of deck workers and engine workers, and when trying to find explanations for the results that becomes problematic."

To address these comments, our classification of the study subjects based on their rank and place of work. Perhaps in the place of work, deck workers and deck officers categorized together and the same is true for engine officers and engine workers (ratings), but we measured occupational injury and disease rates separately by rank and workplace.

14. "The new text in the first paragraph from second line there and marked in yellow is very good information but should be moved to the Methods section, maybe something short here like "from the TMAS database". But the first "illness" there should be disease."

The comments are accepted and corrected accordingly.

15. "Next, yellow-marked part be consistent with decimals in percentages, at least those from this study. Does the US study use the term pathologies?"

What is the rationale behind this sentence about gastrointestinal disorders with no reference: "This might be related to the lack of fresh food in seafarers' diet and problems in food handling that may increase the risk of digestive system diseases?" To address these comments, we have made changes in the structure of the sentences related to the gastrointestinal and cardiovascular disorders in the discussion and edited the decimals as well as corrected the other comments accordingly.

16. "The third paragraph is confusing; maybe there are different kinds of work stressors. Maybe start with the last part of the paragraph; In general ... and so on, and then try to differ between non-officers and officers."

We have tried to reorganize the sentences based on the types of disease in the discussion second and third paragraphs and illustrated the potential risk factors accordingly.

17. "There is no change done (in answer to my comment) to this sentence that not make sense: "Cardiovascular pathologies might be due to work-related stress because deck workers have HIGH work-related stress due to sleep interruption, high job demands, night shift work, and intense activity THAN engine workers." Maybe higher would do, but better to also change word order. Reconsider the use of the word pathologies."

The comments are accepted and have made changes in the discussion third paragraph.

18. "No answer on this my comment: "Discussion: fourth paragraph, galley workers has the same rate as deck workers for dermatology, which is not mentioned or discussed (maybe very few cases)." I will then further elaborate, if not understood. Now last in paragraph four: The authors only mention deck crews but not galley workers, why?"

To address these comments, we have mentioned in the same paragraph the result of IRR rather than IR for deck and engine workers, which was the reason we did not compare the rates of dermatological disorders between deck and galley workers in the first round revised version. Secondly, those results were also statistically significant, and that why we compared deck and engine workers. Regarding galley workers, no statistically significant result was found in comparing rates between deck and galley workers. Anyway, we have included sentences regarding the rates of dermatological diseases of deck and galley workers in the second paragraph of the discussion, from line 20.

19. "The answer on this my comment seems to be including IR: "sixth paragraph, line 2, this is not correct, not compared to galley workers." The changed, but unmarked sentence, now: "The present study has shown that the deck workers had higher rates of overall reported injuries (IR = 8.69) compared to the engine (IR = 4.35) and galley (IR = 7.07) workers" is still not true. Galley workers are not different from deck workers, IRR in comparison with galley is 1.23, 95% CI 0.55-3.24 (that is, far from significant meriting the word higher)."

The comment is accepted and corrected in the revised version of the manuscript that we are re-submitting for review.

20. "This sentence was right in the first manuscript but not now: "deck workers had a relatively LOW risk for injuries THAN machine (engine) workers."

We have made changes to the sentences in the last paragraph of the discussion, line 7.

21. "Strengths and limitations: Reconsider using the term pathologies in the second line."

The comment has been corrected accordingly.

22. "Conclusion. It should be mentioned that the results are during work onboard container ships. Also, first line, "Non-officers had significantly higher rates" compared to whom? Third line, "Deck workers had significantly higher rates" compared to whom? Neither of disorder IRs listed here are higher than those of galley workers. Line 6, it is not clear what is meant: "Overall injury and disease rates for non-officers and officers significantly differed. The same is true between deck workers and engine workers."

We have made changes in the conclusion of the revised version of manuscript that we are re-submitting for review and kindly ask the reviewer to visit again for more information.