

## PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form ([see an example](#)) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below. Some articles will have been accepted based in part or entirely on reviews undertaken for other BMJ Group journals. These will be reproduced where possible.

### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	The impact of the 2011 Great East Japan Earthquake on hospitalization for respiratory disease in rapidly aging society: a retrospective descriptive and cross-sectional study at the disaster base hospital in Ishinomaki
<b>AUTHORS</b>	Yamanda, Shinsuke ; Hanagama, Masakazu; Kobayashi, Seiichi; Satou, Hikari; Tokuda, Shinsaku; Niu, Kaijun; Yanai, Masaru

### VERSION 1 - REVIEW

<b>REVIEWER</b>	Yoshinosuke Fukuchi Juntendo University, Tokyo, Japan
<b>REVIEW RETURNED</b>	19-Mar-2012

<b>THE STUDY</b>	This manuscript describe an extreme catastrophe of the Tunami/Earth quake and patient selection iwas impossible. Retrospective nature of the study is therefore acceptable and statistical analysin may not be mandatory The manuscript should need further brush-up for written English by a native writer. Although not dirupting scientific information, revision of writing english shoul make the paper much easier to read and follow.
<b>RESULTS &amp; CONCLUSIONS</b>	ThE East Japan great earth quake/Tunami is unprecedented in the magnitude and severity of the disaster regarding casualties and fatality in last 150 years. Ther is no previous medical study using modern medical technology.
<b>REPORTING &amp; ETHICS</b>	In the light of exreme emergency, written consent was not realistic and verbal consent is hard to document.
<b>GENERAL COMMENTS</b>	This is a very important paper reporting pulmonary suffering by the great East Japan earthquake/Tunami by a team of respiratory staffs at the Ishinomaki Red Croos Hospital in Miyagi Prefecture. The city of Ishinomaki is devastatingly suufered from the natural disaster on March 11/2011 and this hospital was only functioning hospital in the city. The pulmonary casualties repoted in this paper seem much different from anecdotal reports from previous eathquakes. Drwoning and secondary pneumonia waere dominat cause of mortality. This paper should be published for resporologists in later generation to learn what to expect and how to manage in face of such enexpected natural hazard.

<b>REVIEWER</b>	Shinji Okada, M.D. Director in Laboratory Medicine, South Miyagi Medical Center Japan  I declare there is no conflict of interest on this article.
<b>REVIEW RETURNED</b>	03-Jun-2012

<b>THE STUDY</b>	It is difficult to show diseases were really increased after the earthquake, and bedridden patients were really increased after the earthquake, although we were feeling that patients and bedridden patients were increased after the earthquake. Hospitals in the area except for the Ishinomaki Red Cross Hospital were suffered from earthquake and/or tsunami, and were closed in the period of research. Further, because pneumonia in aged person is very common diseases, especially in disabled person. Families of these patients, older and more disabled, tend to request "moderate" medication for their family patient, but not the special therapy by specialist. Thus, the patients ought to go to other hospitals, the older and the more disabled, must have accumulated to Ishinomaki Red Cross Hospital in this situation. If they want to show the increase of diseases after the earthquake, they should add all of hospital admission in the area during the research periods of 2010 and 2009, or they should limit the patients' address which is truly Red Cross Hospital covers.
<b>RESULTS &amp; CONCLUSIONS</b>	<p>Table 1: It is confusing the number in table 1 is the number of male patients, and I do not think it is important to compare male/female ratio. Authors should add the total patient number of each disease, and either the number or the percentage of the male patients may be enough to show the proportion of male/female ratio.</p> <p>Table 2 and 4th paragraph of Result "Furthermore, the effect of age and sex..." : I do not think calculating odds ratio comparing pre- and post-earthquake means "more likely hospitalized after the earthquake". "more likely hospitalized after the earthquake" generally means "more likely hospitalized among all the patients visited the hospital". For the purpose, authors need to know how many patients of each background visited the hospital. Otherwise, the results of T test shown in table 1 may be enough to show the tendency of patient admission to hospital.</p> <p>Discussion 3rd paragraph: patients came from the field seems to mean those came from their own or relative's home, or shelter.</p> <p>Figure 4: There is no explanation on fourth part of each column.</p> <p>Figure legends tend to be too simple. They do not explain the figures.</p>
<b>GENERAL COMMENTS</b>	This is a report from a hospital served as an almost only one working hospital in the most disastrous area in Japan after the 2011 Tohoku earthquake. It is worth publishing their record how they work in the disaster for the purpose of constructing medical and social system in the case of large disaster. I believe the suggestion in their discussion is very important for the future disaster medicine.

<b>REVIEWER</b>	Rando, Frank University of Arizona Health Sciences Center
<b>REVIEW RETURNED</b>	10-Sep-2012

<b>GENERAL COMMENTS</b>	<p>The impact of the 2011 Great East Japan Earthquake on hospitalization for respiratory disease in advanced aging society: A retrospective descriptive and cross-sectional study at the disaster base hospital in Ishinomaki</p> <p>Review for British Medical Journal by : Frank G. Rando, MS/MSPH</p>
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	<p>,M. Med. Sci., PA,,RRT,RCVT,EMT- Research and Clinical Associate/Faculty, Disaster and Operational Medicine, UAHSC/AEMRC and Consultant/Faculty for US Department of Homeland Security, Medical / Public Health Preparedness, Disaster Epidemiology , Disaster and Operational Medicine ,and Crisis and Emergency Management</p> <p>The article by Yamanda , Shanagama, Kobayashi,et al addresses the impact of the catastrophic impact of the 2011 earthquake and subsequent tsunami on hospitalization for respiratory disease among an aging population.</p> <p>The authors' submission consists of a retrospective and cross-sectional analysis of reviewed data obtained from patients' medical records both pre- and post –disaster, and conducted in a comparative fashion.</p> <p>Standard biostatistical methodology was employed effectively and in a non-biased and consistent manner.</p> <p>This reviewer is satisfied that the authors data and conclusions have been adequately and scientifically validated.</p> <p>The epidemiological impacts and patterns of natural disasters must be appreciated by health care providers at all levels ,due to the fact that all disasters are potential “disease generators”, and depending upon the various mechanisms of harm present and magnitude of an event, may induce a complex injury and illness matrix ,including the exacerbation of chronic illness.</p> <p>Health and public health systems are considered to be components of a community's critical infrastructure ,and therefore, essential to optimal functioning of a society as a whole.</p> <p>In disasters, health and public health systems are overwhelmed due to patient surges ,and they may be directly impacted by the effects of the disaster. These are the stark realities of catastrophic medical care.</p> <p>Furthermore, the authors address a dilemma in both disaster medicine and disaster management : the issues associated with special needs and vulnerable populations, such as, the elderly. Also, pre-disaster medical and public health planning based upon “lessons learned” from previous disasters is also essential to community-wide emergency preparedness. This is alluded to in the authors' summary and conclusion.</p> <p>It is this reviewer's opinion that the authors' demonstrate the aforementioned aspects of disaster epidemiology and disaster medical operations adequately and effectively, despite some degree of omission and inaccuracies due to the acuity and catastrophic nature of the event.</p> <p>Specifically, the authors focus on the prevalence of respiratory disease exacerbations and related hospital admissions .</p> <p>Exacerbations of pre-existing disease among affected populations and acute hospitalizations for these episodes are not uncommon in disaster environments, and were also evident in recent disasters such as Hurricane Katrina/Rita in 2005 in the Gulf Coast and the earthquake in Haiti.</p> <p>The authors present an interesting discussion on the effect of decreased activities of daily living (ADLs) among the elderly and relate this factor to their patients' respiratory health, as many were forced into restrictive quarters in shelter environments. Emergency shelter environments also increase the risk of acquiring droplet-borne and airborne infectious diseases, as well as food-borne illnesses .</p> <p>The authors mention the effects of shelter overcrowding on the incidence of respiratory bacterial infections , which may have</p>
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	<p>culminated in the expression of pneumonias .</p> <p>Loss of infrastructure and re-supply also affected both water and food distribution, leading to severe dehydration and malnutrition , both adding to the risk factors associated with respiratory disease. The disruption of medication regimens also impacted the prevalence and severity of disease exacerbations, and the authors also included lung cancer patients in their study. The authors mention the possibility of treatment interruptions involving chemotherapy and radiation, but cannot confirm these variables on the prognostic outcomes of these patients.</p> <p>Psychoneuroimmunological interactions would certainly act synergistically to compromise host immunity and resistance ,and it would be interesting to correlate and quantify psychological stress, humoral and cellular immunity factors ,stress hormone levels and overt clinical disease in disaster situations.</p> <p>However, austere disaster environments ,especially during the acute phase of a response ,would prove to be a rather difficult venue for even the idea of a biomedical study.</p> <p>Environmental factors such as weather and residual post-tsunami particulate matter on lung health were also considered and discussed as co-factors, and dust inhalation as a causative mechanism may have increased the hospitalization rate for acute exacerbations of COPD.</p> <p>Incidences of lung diseases such as coccidioidomycosis (Valley Fever) have been associated with airborne dust after earthquakes and lung involvement due to toxigenic fungal spores after water incursions due to flooding.</p> <p>Despite some of the obstacles associated with a study of this nature, the authors have assembled a discussion which is compelling, interesting, relevant, informative and balanced. This reviewer applauds the authors for contributing to the growing volumes of literature in disaster medicine. This article has important implications not only for disaster medicine or pulmonary and critical care medicine, but for public health and disaster management policy-making on a global scale.</p> <p>Readers need to appreciate the uniqueness of conducting epidemiological studies related to a disaster or catastrophic event such as the tragic Japanese earthquake and tsunami.</p> <p>Disaster-related epidemiological research can be very difficult in disaster environments due to extensive disruptions in information systems, for example, and also attributable due to the general chaotic nature of high acuity events and the focus on rescue efforts ,life-saving interventions and community recovery. Disasters are evolving, complex and dynamic entities which do not tend to yield precise and consistent data nor lend themselves easily to full scientific scrutiny or academic inquiry. Disasters , complex emergencies and catastrophic events require unconventional and creative thought (ie., "thinking outside of the box") ,flexibility , adaptability and resourcefulness, therefore, research strategies and approaches may have to be modified without sacrificing integrity, validity and overall standards and quality.</p> <p>Disaster epidemiology and disaster medicine are no exceptions ,as controlled research or clinical environments seldom exist.</p> <p>This is not a "traditional" bench or double-blind clinical study as one is accustomed to in the scientific and medical literature, and although some data may have been omitted, this study is well designed, well referenced and the discourse ,evidence and conclusions are reasonable .</p> <p>There are some errors in usage and spelling, however, these are</p>
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	<p>easily rectified via editing.</p> <p>The authors vividly reinforce the reality that we face some daunting challenges in the provision of medical services during times of crisis and catastrophe. We need to realize that both natural and man-made disasters can inflict disease and mass trauma upon affected populations , and that vulnerable populations such as children, elderly ,disabled and other at-risk groups may present with increased morbidity and mortality during disasters, complex emergencies and catastrophic events.</p> <p>We need to be empowered to approach high impact, high consequence events utilizing an integrated disaster ecology context where host-environment interactions influence health and disease and where forces of harm exert deleterious effects on entire populations. Disasters ,complex emergencies and catastrophic events all possess multifactorial components and are analogous to multi-system pathology.</p> <p>All disasters share some common characteristics:</p> <ul style="list-style-type: none"> <li>• Extraordinary magnitude of harm</li> <li>• Ecological disruption</li> <li>• Disproportionate impact on vulnerable communities</li> <li>• Demands for response that exceed the community's ability to cope (needs exceed resources)</li> <li>• Necessity for external assistance</li> <li>• Medical care may consist of austere and unconventional medicine in hazardous and extreme conditions.</li> <li>• Public health and public safety will actively interface ,and public health infrastructure will assume a leading role.</li> </ul> <p>The “patient” is an entire affected population , the infrastructure, the physical , biological ,psychosocial and economic environment ,and the complex interactions among these components and systems. In essence, an entire society can be deemed to be “the patient”.</p> <p>The “disease model” involves the entire epidemiological footprint of the event caused by injury , illness and various disruptions / failures of vital services and critical/supportive infrastructure (eg.,public utilities, health care) , breakdown of societal mechanisms.(eg. population displacement, homelessness, family separation, lawlessness and civil disorder) and subsequent psychosocial stressors.</p> <p>There is an obligation to be prepared so that we ,as medical professionals and members of the global community, may mitigate suffering ,decrease morbidity and mortality ,and offer hope in the face of profound and utter devastation.</p> <p>Overall ,via their astute observations, analysis and conclusions , the authors have contributed a valuable study to the annals of austere operational medicine and pulmonology.</p>
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<b>REVIEWER</b>	Butler, James Harvard Medical School, Harvard School of Public Health
<b>REVIEW RETURNED</b>	17-Sep-2012

<b>THE STUDY</b>	There needs to be some serious editorial work on the English. Re supplement documents,
<b>RESULTS &amp; CONCLUSIONS</b>	The presentation is jumbled; the authors need to get the story clearer, rather than just a list of numbers.
<b>GENERAL COMMENTS</b>	This is an important paper to come out of the only hospital continuing to function in the aftermath of the 2011 earthquake and tsunami disaster in the region of Ishinomaki, a major city in Northeast Japan. Besides giving a comprehensive set of statistics

	<p>on data collected in the first 60 days following the disaster, the paper compares these data with similar periods in 2009 and 2010. This is very useful.</p> <p>I have a number of comments which would strengthen the paper. First, while the English is very good (in the sense that there are only a few places of confusion in meaning), it is not colloquial, and needs some serious editing.</p> <p>More importantly, there needs to be some rethinking of how to present data. One is simply overwhelmed by the list of numbers, fractions, proportions, etc. without a clear roadmap of the really important question of which of these data are really significant at the human level. I do not mean at the level of some p value; clearly with a large enough N, all differences become statistically significant, but may not be physiologically (or in this case pathophysiologically) significant. The reader needs some help here.</p> <p>Examples of these confusions are listed below (not exhaustive).</p> <p>Pg 3 L 30 The results section could use some more focus. E.g. we first read that 1769 pts were admitted, of whom 322 were admitted for respiratory disease. Are these big or small numbers? Here the au's should give the direct comparison with the 2009/10 data so that we have a sense of the magnitude of the disaster. Next sentence is about age; is that important (I think not).</p> <p>3.39. "Elderly ... were more likely..." compared to what? Compared to younger people in 2011, or compared with elderly in 2009/10?</p> <p>3.43. How can the mean ages of 73 and 70 (with and without deterioration of ADL) be reconciled with an overall mean of 76 (Line 33).</p> <p>4.20. The phrase "advanced aging society" is both misleading and ambiguous. The word "advanced" here can mean (and how I initially read it) as reflecting culture, educational level, QOL, nutrition, etc. rather than what I think is meant as "rapidly aging" or some such phrase. This phrase also occurs elsewhere in the ms.</p> <p>4.23. The "Although..." sentence doesn't seem to make sense (reports did show correlation with age but didn't investigate the effect on aging society?)</p> <p>5.30. How many categories? First we read 3, then there are two more (original and newly dependent). So was the analysis done on 5 categories, or the last 2, or what?</p> <p>6.15. The proportion hospitalized for respiratory disease being higher (almost twice) in 2011 compared to baseline is important; this should be emphasized (I assume it's statistically significant). Next sentence, give the actual numbers of hospitalizations.</p> <p>6.42 "The number of hospitalizations for ... and for other diseases " were not so different? For lung cancer, yes, but your own data show a profound difference for the other diseases!</p> <p>6.52. Is this difference in age important? I suspect not, even though it may be statistically significant.</p> <p>7.27 Four lines to explain loss of data in a small number of patients. Just say so, without going into details.</p> <p>7.33 You give numbers in % for after, but absolute numbers before. Please be consistent (e.g. use proportions for both if that's the major point).</p> <p>7.36 Previous sentence is about the pts before, and this sentence "Those patients ..." refers to after. Which is it? Unclear as written.</p> <p>10.22. It is not clear what "proportion" this is referring to. Is it the pre-existing proportion of elderly comparing different sites, or is it the proportion of elderly who died in consequence?</p>
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	<p>11.14. Again, replace “advanced” with “rapidly”.</p> <p>11.30. But I thought that Ishinomaki Sekijūji was the only functional hospital, so where are the other 70%? And what is meant by “victim” here; does it include those who died, or those who survived and needed treatment, or what?</p> <p>Table 1. I’m not sure this table is necessary, since most of the numbers are quoted in the text. One solution is to keep the table, but delete all references in the text except for the statistically different numbers. Another is just to list the significant differences in the text, and delete the table.</p> <p>Table 2. I’m also not impressed with the data here. Mostly the ORs are very close to 1 (even if statistically different), meaning that there really isn’t much of an effect e.g. of age. Moreover, the differences in OR as a function of gender are remarkable similar between 2011 and baseline. I suggest just summarizing this in the text and deleting the table.</p> <p>Figure 2. Please reverse the order of the bars such that time goes from left to right! More importantly, the numbers don’t seem to add up. Here you have 327 pts covering all diseases in 2011, but it looks like about 360 pts in the graph in Figure 1. Similar questions regarding the rest of the numbers, which I didn’t check, but you must make sure that the numbers are self consistent.</p> <p>Overall, a good job and an interesting manuscript. I think the suggestions towards the end about the importance of adequate drug supplies and getting people out of the unhealthy environments of shelters is important and should be emphasized.</p> <p>A final point of importance. Pneumonia is cited as the most frequent disease encountered, but there is no mention of what type. Are the major pathogens bacterial or viral? What species or strains of bacteria, or which viruses? This should be addressed, even if the answer is not known. Were cultures done? Perhaps they were not done due to the congestion in hospital laboratory facilities?</p>
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## VERSION 1 – AUTHOR RESPONSE

Dear Professor Yoshinosuke Fukuchi,

Thank you for your thoughtful review and positive evaluation on our article. We have brushed up our English in the revised version.

Dear Dr. Shinji Okada,

Thank you for your thoughtful review and positive evaluation on our article. We revised our manuscript according to your suggestions.

1.

It is difficult to show diseases were really increased after the earthquake, and bedridden patients were really increased after the earthquake, although we were feeling that patients and bedridden patients were increased after the earthquake. Hospitals in the area except for the Ishinomaki Red Cross Hospital were suffered from earthquake and/or tsunami, and were closed in the period of research. Further, because pneumonia in aged person is very common diseases, especially in disabled person. Families of these patients, older and more disabled, tend to request “moderate” medication for their family patient, but not the special therapy by specialist. Thus, the patients ought to go to other hospitals, the older and the more disabled, must have accumulated to Ishinomaki Red Cross Hospital in this situation. If they want to show the increase of diseases after the earthquake, they should add all of hospital admission in the area during the research periods of 2010 and 2009, or they should limit the patients’ address which is truly Red Cross Hospital covers.

Response:

Thank you for your comment. We agree that our report does not completely represent the whole impact of the earthquake/tsunami on respiratory diseases. As we write in the abstract and “Strengths and weaknesses of study”, main purpose of our reports is to investigate the impact of the Great East Japan Earthquake on respiratory medicine at “the disaster base hospital” which is expected to keep the function even in the front line of the catastrophic disaster. We think other researchers would investigate the impact of this earthquake on larger scale in the near future.

To clarify this, we revised the section of “discussion”.

(Page12, line23-26)

2.

Table 1: It is confusing the number in table 1 is the number of male patients, and I do not think it is important to compare male/female ratio. Authors should add the total patient number of each disease, and either the number or the percentage of the male patients may be enough to show the proportion of male/female ratio.

Response:

We removed table 1 and summarized those results in the text according to your and another reviewer’s suggestions.

(Page7, line14-25)

3.

Table 2 and 4th paragraph of Result “Furthermore, the effect of age and sex....” : I do not think calculating odds ratio comparing pre- and post-earthquake means “more likely hospitalized after the earthquake”. “more likely hospitalized after the earthquake” generally means “more likely hospitalized among all the patients visited the hospital”. For the purpose, authors need to know how many patients of each background visited the hospital. Otherwise, the results of T test shown in table 1 may be enough to show the tendency of patient admission to hospital.

Response:

In our paper, we didn’t examine “more likely hospitalized among all the patients visited the hospital”. We tried to examine the effect of the disaster on hospitalization for respiratory disease with regard to age and sex. For this purpose, we compared the number of respiratory admission in terms of age and sex for 60 days after the disaster with that of the corresponding periods of the past two years. We don’t think it is trivial; however, as another reviewer suggested, the results of Table 2 is similar to that of Table 1. Therefore, we removed Table 2 and summarized the results in the text.

(Page6, line14-15, Page7, lines14-29)

4.

Discussion 3rd paragraph: patients came from the field seems to mean those came from their own or relative’s home, or shelter.

Response:

We modified the text, Page9, line23-26.

5.

Figure 4: There is no explanation on fourth part of each column.

Response:

We added the explanation in the figure 4

6.

Figure legends tend to be too simple. They do not explain the figures.

Response:

We explained the figure in the main text following the other papers published in BMJ open. We revised the legend of figure 4.



Figure 4. Change to the new Fig legend.

Dear Dr. Frank G. Rando,

Thank you very much for your positive evaluation on our article. Your comments are very encouraging to us.

Dear Dr. James Butler,

Thank you for your thoughtful review and positive evaluation on our article. We revised our manuscript according to your helpful suggestions.

1.

Pg 3 L 30 The results section could use some more focus. E.g. we first read that 1769 pts were admitted, of whom 322 were admitted for respiratory disease. Are these big or small numbers? Here the au's should give the direct comparison with the 2009/10 data so that we have a sense of the magnitude of the disaster. Next sentence is about age; is that important (I think not).

Response:

Upon your suggestion, we added the number of unscheduled hospitalizations in 2009 and 2010 in the result section of main text.

(Page3, line18-22)

We erased the sentence about age.

2.

3.39. "Elderly ... were more likely..." compared to what? Compared to younger people in 2011, or compared with elderly in 2009/10?

Response:

We apologize for inaccurate expression. We erased this sentence from abstract and wrote the direct comparison of mean age and male proportion in the study period with those in the past two years in results section.

(Page7, line14-25)

3.

3.43. How can the mean ages of 73 and 70 (with and without deterioration of ADL) be reconciled with an overall mean of 76 (Line 33).

Response:

In the text, we did not mention that mean age of the "originally dependent" group was 80.3 years old. Also, we erased this section in the abstract.

4.

4.20. The phrase "advanced aging society" is both misleading and ambiguous. The word "advanced" here can mean (and how I initially read it) as reflecting culture, educational level, QOL, nutrition, etc. rather than what I think is meant as "rapidly aging" or some such phrase. This phrase also occurs elsewhere in the ms.

Response:

We agree with your comment. We replaced "advanced" by "rapidly" throughout the entire manuscript.

5.

4.23. The "Although..." sentence doesn't seem to make sense (reports did show correlation with age but didn't investigate the effect on aging society?)

Response:

We agree with your comment. We revised the text as followings.

(Page4, line26)

6.

5.30. How many categories? First we read 3, then there are two more (original and newly dependent). So was the analysis done on 5 categories, or the last 2, or what?

Response:

First, we collected the data as “independent”, “partially dependent” or “dependent” before and after earthquake. Next, we categorized the patients into three categories, “originary dependent”, “newly dependent”, or “independent throughout”, in order to investigate the impact of ADL state or its deterioration on hospitalization for respiratory disease. To clarify it, we added the text as followings. (Page5, line35)

7.

6.15. The proportion hospitalized for respiratory disease being higher (almost twice) in 2011 compared to baseline is important; this should be emphasized (I assume it's statistically significant). Next sentence, give the actual numbers of hospitalizations.

Response:

We agree with your comment. We revised the text as followings.

(Page6, line23-29)

8.

6.42 “The number of hospitalizations for ... and for other diseases “ were not so different? For lung cancer, yes, but your own data show a profound difference for the other diseases!

Response:

We apologize for unclear explanation. The “other disease” means the category of “others”. We revised the text as followings.

(Page7, line3 and Page7, line10-12)

9.

6.52. Is this difference in age important? I suspect not, even though it may be statistically significant.

Response:

It has been reported that the elderly, children, and women are vulnerable and more likely killed during disasters. From this aspect, it may be worthwhile to investigate whether the disaster impacted on the hospitalization for respiratory disease after the disaster in terms of age and sex.

10.

7.27 Four lines to explain loss of data in a small number of patients. Just say so, without going into details.

Response:

We erased following text.

(Page8, line3-5)

11.

7.33 You give numbers in % for after, but absolute numbers before. Please be consistent (e.g. use proportions for both if that's the major point).

Response:

We revised the text as followings.

(Page8, line5-9)

12.

7.36 Previous sentence is about the pts before, and this sentence “Those patients ...” refers to after. Which is it? Unclear as written.

Response:

We revised the text as response12.

13.

10.22. It is not clear what “proportion” this is referring to. Is it the pre-existing proportion of elderly comparing different sites, or is it the proportion of elderly who died in consequence?

Response:

We apologize unclear explanation. We revised the text as followings.

(Page11, line13)

14.

11.14. Again, replace “advanced” with “rapidly”.

Response:

We corrected the text.

15.

11.30. But I thought that Ishinomaki Sekijoji was the only functional hospital, so where are the other 70%? And what is meant by “victim” here; does it include those who died, or those who survived and needed treatment, or what?

Response:

“Victims” was used as “dead persons” in our manuscript. We replaced the term with “fatalities” in the sentence.

“The other 70% of dead person” means the 70% of total death by the disaster in Japan, not in Ishinomaki medical zone. We revised the text as followings.

(Page12, line21)

16.

Table 1. I’m not sure this table is necessary, since most of the numbers are quoted in the text. One solution is to keep the table, but delete all references in the text except for the statistically different numbers. Another is just to list the significant differences in the text, and delete the table.

Table 2. I’m also not impressed with the data here. Mostly the Ors are very close to 1 (even if statistically different), meaning that there really isn’t much of an effect e.g. of age. Moreover, the differences in OR as a function of gender are remarkable similar between 2011 and baseline. I suggest just summarizing this in the text and deleting the table.

Response:

We agree with your comment. We erased Table1 and Table2, and summarized the content in the text. See the followings.

(Page7, line14-25)

17.

Figure 2. Please reverse the order of the bars such that time goes from left to right! More importantly, the numbers don’t seem to add up. Here you have 327 pts covering all diseases in 2011, but it looks like about 360 pts in the graph in Figure 1. Similar questions regarding the rest of the numbers, which I didn’t check, but you must make sure that the numbers are self consistent.

Response

Thank you for your advice. We reversed the order of the bars in correct manner.

We think your later pointing is misunderstanding. Figure1A represents the hospitalization for “all cause”. Figure1B represents that for respiratory disease, containing pneumonia, AE-COPD, asthma, lung cancer, and other respiratory disease. So, the total number of six points of 2011 in Figure1B is 327 patients, which matches Figure2.

18.

Overall, a good job and an interesting manuscript. I think the suggestions towards the end about the importance of adequate drug supplies and getting people out of the unhealthy environments of shelters is important and should be emphasized.

A final point of importance. Pneumonia is cited as the most frequent disease encountered, but there is no mention of what type. Are the major pathogens bacterial or viral? What species or strains of bacteria, or which viruses? This should be addressed, even if the answer is not known. Were cultures done? Perhaps they were not done due to the congestion in hospital laboratory facilities?

Response:

We could not carry out a bacteriological examination for 14 days after the earthquake due to shortage of water, fuel gas, and manpower. After that, we could perform bacteriological examination, bacterial culture or gram staining. Actually, we treated the most of pneumonia as “aspiration pneumonia in nursing home” because of their ADL. We are going to write the reports in regard to this matter.

## VERSION 2 – REVIEW

<b>REVIEWER</b>	James P. Butler, Ph.D. Dept. Env. Health, Harvard School of Public Health, Boston, MA, USA Dept. Medicine, Harvard Medical School, Boston, MA, USA
<b>REVIEW RETURNED</b>	26-Nov-2012

<b>THE STUDY</b>	Minor English editing would help. The science is ok.
<b>GENERAL COMMENTS</b>	<p>This paper has been quite significantly improved; almost all of my original concerns have been addressed, but two remain.</p> <p>1. I agree with one of the other reviewers that the figure legends need more explanation. I still had some trouble with the new Fig 1A,B, and Fig. 2. A few points of clarification here would help. Fig. 1: In particular, I might add “new” to “hospitalizations”; the casual reader seeing “number of patients” on the y axis might see the number of actual patients declining rather than increasing (although the text does not refer to length). Fig. 2: The legend says “presented in 10 day bins”, which is not correct. To emphasize this, you could say “... respiratory disease pooled from March 11 to May 9 ...”, or “...cumulative new admissions over the period ...” Also, even though “others” is now spelled out in the text, it would help here to change the legend such that the gray box is labeled “Other respiratory disease”. This same comment applies to Fig. 3.</p> <p>2. I appreciate the authors’ response to my question on what species of pathogens were involved, and in particular the magnitude of the disaster preventing such laboratory work. But I think it’s important to say this. I think the first 3 sentences of their response could be added almost word for word to the paper somewhere in the discussion, namely (with slight rephrasing): “We could not carry out a bacteriological examination for 14 days after the earthquake due to shortage of water, fuel, gas, and manpower. After that, we could perform bacteriological examination, bacterial culture or gram staining. We treated most of the pneumonias as “aspiration pneumonia in nursing home” because of the patients’ ADL.</p> <p>3. The English is much improved, but there are still a number of places where English editing would be helpful, but these are sufficiently minor that they are probably best left to a copy editor.</p>

## VERSION 2 – AUTHOR RESPONSE

Dear Dr. James Butler,

Thank you very much for your thoughtful review. We revised our manuscript according to your suggestion.

1.

I agree with one of the other reviewers that the figure legends need more explanation. I still had some trouble with the new Fig 1A,B, and Fig. 2. A few points of clarification here would help.

Fig. 1: In particular, I might add “new” to “hospitalizations”; the casual reader seeing “number of patients” on the y axis might see the number of actual patients declining rather than increasing (although the text does not refer to length).

Fig. 2: The legend says “presented in 10 day bins”, which is not correct. To emphasize this, you could say “... respiratory disease pooled from March 11 to May 9 ...”, or “...cumulative new admissions over the period ...” Also, even though “others” is now spelled out in the text, it would help here to change the legend such that the gray box is labeled “Other respiratory disease”. This same comment applies to Fig. 3.

Response:

Upon your suggestion, we revised the legend of figure 1 and 2, and replaced “others” by “other respiratory disease” in figure 2 and 3.

2.

I appreciate the authors’ response to my question on what species of pathogens were involved, and in particular the magnitude of the disaster preventing such laboratory work. But I think it’s important to say this. I think the first 3 sentences of their response could be added almost word for word to the paper somewhere in the discussion, namely (with slight rephrasing):

“We could not carry out a bacteriological examination for 14 days after the earthquake due to shortage of water, fuel, gas, and manpower. After that, we could perform bacteriological examination, bacterial culture or gram staining. We treated most of the pneumonias as “aspiration pneumonia in nursing home” because of the patients’ ADL.

Response:

We added those sentence in discussion.  
(Page9, line 28-32)

3.

The English is much improved, but there are still a number of places where English editing would be helpful, but these are sufficiently minor that they are probably best left to a copy editor.

Response:

Thank you very much. I am trying to improve myself in English.