Author's response to reviews

Title: The influenza A (H1N1) pandemic in Reunion Island: knowledge, perceived risk and precautionary behaviour

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Author's response to reviews: see over
Dear Editor,

We would thank the reviewers for the useful and helpful feedback we have received to revise our manuscript entitled ‘The influenza A (H1N1) pandemic in Reunion Island: knowledge, perceived risk and precautionary behaviour’. In this letter we give a clear point-by-point response to the comment of reviewers. In the revised manuscript you will find the changes we made as a result of these comments.

We would be grateful if you would reconsider this paper for publication in BMC Infectious Diseases.

If you have any further questions, please don’t hesitate to contact me.

Your sincerely,

Please note that all coauthors have approved the new version submitted herewith.

Prof. François Taglioni
CRVOI
Reunion Island
Revisions requested by Prof. Marloes Bults

ABSTRACT

Comment: "alinea results: move first sentence to background or delete"
We deleted: "The H1N1 influenza virus epidemic was regarded as a moderate health problem with a mean score of perceived severity and vulnerability of 6 and 5 respectively (on a scale of 0 to 10)."

Question: "alinea conclusion: what are recommendation for future outbreaks?"
We Added: "Further qualitative researches must be implemented to adapt messages to social and cultural realities of the Reunion island populations and to prevent misconceptions."

BACKGROUND

Comment: "alinea delete sentence "In June of 2009...seasonal influenza epidemic". Move sentence 2 of 2e alinea to 1st alinea ("The H1N1 virus pandemic was expected to reach.." This should be the last sentence of alinea 1"
We Deleted: " In June of 2009, the southern hemisphere winter was beginning. There was a major risk that the H1N1 virus pandemic would spread to the southern hemisphere countries at the same time as the usual seasonal influenza epidemic."

Comment: "Move sentence 2 of 2e alinea to 1st alinea ("The H1N1 virus pandemic was expected to reach..<" This should be the last sentence of alinea 1".
We Moved to 1st alinea: "The H1N1 virus pandemic was expected to reach Reunion Island before reaching Europe".

Comment: " The 2e alinea should describe epidemiology and course of H1N1 in Reunion Island. So, start 2e alinea with sentence "Reunion Island is a subtropical overseas French.. Mauritius".
Done
We Deleted to 2e alinea: "In 2005, apart from a suspected case of a traveler returning from Asia, bird flu H5N1 had no impact on Reunion Island [8]

Comment: continue 2e alinea with the sentences started with"The first case of H1N1..."
We Moved to 2e alinea: "The first case of influenza A (H1N1) pandemic was detected in a traveler returning from Australia on July 5, 2009 [11]. The first autochthonous case was reported on July 22, 2009. In 2009, influenza A (H1N1) pandemic broke out during the normal period of seasonal influenza. The outbreak started on week 30 (July 20), peaked on week 35 (August 28) and lasted until week 38 (September 20) (Figure 1)."

Comment: Remove sentence "On Reunion Island, early warning system.."
We Deleted 4e alinea : "On Reunion Island, early warning and monitoring procedures for influenza epidemics have been tightened since May, 2009".

Comment: Remove sentences about symptomatic infection from clinical survey "In 2009, the first estimation of symptomatic infections ...medical detection (3)."
We Deleted 4e alinea: "In 2009, the first estimation of symptomatic infections from clinical surveillance was 13% within the overall population [6]. Seroincidence of influenza A (H1N1) infection was three times that of the estimated from clinical surveillance, indicating that almost two thirds of the infections occurring at the community level have escaped medical detection [3]"

Comment: "Describe seroconverse rates according to age and impact on mortality here".
We Moved (and changed) to 2° alinea this sentence: "A sero survey conducted on Reunion Island, in the frame of the CoPanFlu RUN cohort study, estimated the seroconversion rates to the pandemic virus, to 45.2% (all ages) and respectively 63.2% (<20 years), 39.4% (20-59 years), 16.7% (≥60 years) [4]. During the outbreak, 14 death certificates reporting influenza-like illness were reported to the island’s public health authorities. The 2009 pandemic influenza A (H1N1) had no detectable impact on the overall mortality on Reunion Island since no excess of mortality was observed during"
the outbreak [5].

Comment: Also remove last sentences "The outbreak dynamics and mortality rate on Reunion Island were comparable...influenza epidemic".

We Deleted 4e alinea: "The outbreak dynamics and mortality rate on Reunion Island were comparable to those observed in other southern hemisphere countries [12] [13]. Generally speaking, the 2009 influenza A (H1N1) pandemic appeared moderate and comparable to previous seasonal influenza epidemics.

Question: "3e alinea: this alinea should describe measures advised by government as now described in alinea 3. This alinea could be shortened?"

We Deleted 3e alinea:
"The WHO proposed various measures and issued guidelines on personal hygiene, quarantine, travel restrictions, the closure of schools and bans on public gatherings [5].
"In 2005, apart from a suspected case of a traveler returning from Asia, bird flu H5N1 had no impact on Reunion Island [8].
"Although modes of transmission of chikungunya and influenza are completely different, it may be assumed that the".
"As a result, we can hypothesize that health professionals and health authorities were prepared and that the island’s population was more prepared than other populations to deal with an outstanding influenza epidemic".

Question: "In the 3e alinea is described that RI is a multiethnic population, please give % of different ethnic origins (% European, African, Asian)".

In France it is prohibited by law to collect and disseminate ethnic or religious statistics on population. In that condition we can not provide these information. Nevertheless, according to the history of Reunion settlement we can say that Reunion has a multiethnic population: that is the origin of the name of the island (Reunion means in English "living together").

Comment and question: "4th alinea could describe aim of the study. Start with sentence To monitor the progression of the pandemic, investigate ... a study called COPANFLU was implemented. Remove long sentence "It was part of the COPANFLU international project etc. This info can be described in acknowledgement if necessary. Continue with sentence "This includes three studies on different aspect.." And describe that as part of the social science this study was conducted with aim etcetc".

We Moved (and changed) to 4e alinea "The present study aimed to investigate perceived risks, concern, behavioural responses and other key determinants of precautionary behaviour related to the outbreak of the Influenza A (H1N1) in Reunion Island. This was done in the frame of a research programme called CoPanFlu-RUN that included three complementary components on epidemiological, virological and social sciences aspects. The epidemiological and virological parameters of the epidemic were assessed through a prospective, in population study conducted from July 21 to December 23, 2009 during the outbreak of influenza A (H1N1), [4]. Shortly after passage of the epidemic wave the outbreak, the social sciences aspects were specifically investigated"

We Moved to 4e alinea: "This includes three studies on different aspects: epidemiological; virological; social sciences. First, during the outbreak of influenza A (H1N1) on Reunion island, a prospective study was conducted from July 21 to December 23, 2009, to assess the epidemiological and virological parameters [3]. Secondly, following the outbreak, the social sciences aspects were launched"

We Deleted 4e alinea:
It was a part of the CoPanFlu international project, a consortium between the French National Institute of Health and Medical Research (INSERM), the Institute of Research for Development (IRD) under the promotion of the School of Advanced Studies in Public Health (EHESP).

PS: to answer to the demand of the second reviewer we have created a new alinea dividing in two the 3e alinea (the first one describe measures advised by government and the second one is about the existing theory and literature about risk perception for health problems.
We moved to 2e alinea: "The context in which the pandemic was first announced and infested the island is also worth considering. In 2005-2006, an epidemic related to chikungunya, an alpha virus transmitted via a vector (Aedes Albopictus mosquito), had a major impact on public health and received extensive media coverage [9]. During this epidemic, over one third of the population was infected [10]. The experience of the chikungunya epidemic had sensibilized Reunion Island’s population to the risks and dangers of emerging epidemic diseases".

We moved to the new alinea (second part of the former 3e alinea): "The perceptions and reactions among the general public during pandemics helps to improve communication on health risks and to shift attitudes among the general public [14] [15]."

Question: "Are there other studies performed in your region on this topic?"
Actually, this is the first and only study on the matter in the south west Indian Ocean.

METHOD

Comment: "use subheadings as participants, questionnaire, statistical analyses, ethical approval etc"
We used, as requested, subheadings.

Question: "was power calculation performed?"

The number of households was first calculated based on a standardized sample according to the age structure, sex and geographic location of the Reunion Island population (extracted from the French National Institute for Statistics and Economical Studies). The sample size was calculated for identifying factors of precautionary behaviour. Based on estimation’s of 30% taking precautionary behaviour, 1% absolute precision and 5% p-value, the estimated sample size was 474 people.

Question: "why was a pre-existing sample used and not a new sample?"

We already answered in the article about this matter " In order to quickly implement the study, given the imminent spread of the pandemic on Reunion Island, we used a pre-existing sample established in October, 2006, to investigate the seroprevalence after the chikungunya outbreak" (p. 3).
Moreover, it is was the best and the quickest way (the H1N1 virus pandemic was expected to reach Reunion Island before reaching Europe) to have a representative sample of Reunion island population.

Question: "how was the household reference person identified?"

The person of the household is identified among the three oldest people in the household. If there are a couple of these, the reference person is always the male parent. If the household has no couple, the reference person is the oldest active (male or female) (source: French National Institute for Statistics and Economical).

Question: "last sentence "the choice of household's reference person...adults act as model to follow" Is there literature which supports this fact?"

We did not find references in literature and we deleted this sentence : "The choice of the household’s reference person for the purposes of the survey is usually helpful since within each household it may be assumed that adults set an example and act as a model to follow.”

We added (p. 3): After this sentence “The questionnaire was only administrated to the household’s reference person” we added this one " The person of the household is identified among the three oldest people in the household. If there are a couple of these, the reference person is always the male parent. If the household has no couple, the reference person is the oldest active (male or female) (source: French National Institute for Statistics and Economical)".

We inserted a . after (19)

Comment: Deleted the symbols -, -, - and wrote it in sentences.
We deleted as requested:
"- frequent (and more frequently than usual) hand washing;
- be vaccinated against seasonal influenza;
- wear masks in public;
- avoid public transport;
- avoid crowded places;
- do not send children to school"
And we wrote this sentence "Respondents were asked whether they had taken measures to prevent themselves getting infected with influenza A (H1N1). Possible measures included washing hands more frequently, getting vaccinated against seasonal influenza, wearing masks in public, avoiding public transport, avoiding crowded places, not sending children to school”.

We Moved this alinea from Statistical analysis to questionnaire

"Three types of questions were asked to assess the perceived severity of influenza A (H1N1). The first related to the pathology itself (severity of influenza A (H1N1) versus seasonal influenza, the consequences of influenza A (H1N1) deemed fatal, availability of an effective treatment). The second question addressed the impact on public health of influenza A (H1N1) among the population (percentage of the population infected by influenza A (H1N1), number of deaths). The final question assessed the severity perceived by the respondent where he or she was personally exposed to influenza A (H1N1) (on a severity scale of 0 to 10).

And we changed this alinea into this one with more details.

"Several questions were asked to assess the perceived severity of influenza A (a person’s belief on how serious contracting the illness would be for him/her). Three related to the pathology itself: "do you think influenza A is more severe than seasonal influenza?"; "do you think influenza A is a fatal disease?"; "is there no efficient treatment against influenza A?".

An other question was asked in order to quantify the perceived severity. This question “if you were to get infected with influenza A, how serious a health issue would it be for you?” gave a perceived severity score on a scale of 0 to 10).

Moreover, a general question addressed the impact on public health of influenza A (H1N1) among the population (percentage of the population infected by influenza A (H1N1), number of deaths)."

We Moved this alinea from Statistical analysis to last alinea of questionnaire

A review of each type of precaution taken produced a scale ranging from 0 (no precaution taken) to a maximum of 6 precautions taken at the same time. A list of precautions regarded as effective per individual produced a rating scale for the effectiveness of preventive measures from 0 to 6. Also, a list of twelve potential risks (including seasonal and A (H1N1) influenza) or dangers quoted by the media or present in the environment was proposed by the interviewers and the respondents had to rank their concerns with regard to these risks on a scale of 0 to 10.

Question: "qualitative data were analysed with frequency distributions, shouldn't be quantitative data?"

It is right, so we deleted this sentence in the article

Question: "which statistical package was used? SPSS or SAS?"

We added: "Data entry used EpiData version 3.1 (The EpiData Association, Odense, Denmark). SAS version 9.1 (SAS Inc., Cary, NC, USA) was used for statistical analysis".

Comment: "questionnaire items are not clearly described, suggestion is to describe questionnaire items and answer scales in appendix".

We added: To better describe variable included in univariate analyses we added the sentence "Regarding antecedents (infection and vaccination), the questionnaire included a question on whether the respondent was vaccinated against seasonal influenza in the last year and whether he or she got during the five last years the seasonal influenza".

We added: To better define "perceived severity" and to make clear the corresponding issue we added this sentence (p. 3) "a person’s belief on how serious contracting the illness would be for him/her). The question “if you were to get infected with influenza A, how serious a health issue would it be for you?” gave a severity score on a scale of 0 to 10)".

-5-
We added: To better defined "perceived vulnerability" and to make clear the corresponding issue we added this sentence (p. 3) "The question: "how likely are you to get infected with influenza A (H1N1)?" gave a perceived vulnerability score of influenza A (H1N1) on a scale of 0 to 10). The perceived vulnerability of influenza A (H1N1) is a person’s perception of the chance that he/she will contract the disease. A same question, to assess the vulnerability of seasonal flu, gave a perceived vulnerability score of seasonal flu on a scale of 0 to 10".

We added: To better defined "response efficacy" and to make clear the corresponding issue we added this sentence "Response efficacy relates to the belief of people in the effectiveness of the available protective actions was evaluated by the interviewer with two questions. First a general question with a dichotomous answer (yes or no) was asked "are there effective preventive measures to protect you from influenza A (H1N1)?". Second, a list of the recommended influenza A (H1N1) prevention measures was read (washing hands more frequently, getting vaccinated against seasonal influenza, wearing masks in public, avoiding public transport, avoiding crowded places, not sending children to school). The question was "which preventive measures among this list you think are effective at keeping you from getting the influenza A (H1N1)?". Precautions regarded as effective per individual produced a score of the effectiveness of preventive measures from 0 to 6.

We added: To better defined "perceived self-efficacy" and to make clear the corresponding issue we added this sentence "Perceived self-efficacy (a person’s level of confidence in his/her ability to perform the preventive measure) was assessed by asking a question with a dichotomous answer (sure or not sure) "how sure are you that you yourself can prevent getting the influenza A (H1N1)?".

We Moved: this alinea to the end of questionnaire section. "During the interview, respondents were first asked whether they had taken precautions to avoid influenza during the epidemic. All responses were noted, including non-recommended or mistaken responses. In a second, more directive phase, six types of precautions (washing hands more frequently, getting vaccinated against seasonal influenza, wearing masks in public, avoiding public transport, avoiding crowded places, not sending children to school) were mentioned one by one by the interviewer. Respondents were asked whether they had taken measures to prevent them getting infected with influenza A (H1N1). Respectively, two scores of preventive measures taken immediately and after detailed review with interviewer were implemented on a scale of 0 to 6".

Comment: "please describe statistic methods more fully, i.e. outcome variables and predictors included"

We better described, with much more details and precision the statistic method on the alinea called "Statistical analysis" as follow: "To study correlates of precautionary behaviour, a new dichotomous variable "precautionary behaviour" was defined and coded 1 (yes), if respondents had taken one or more preventive measures, and coded 0 (no) if respondents had done nothing. Univariate and multivariate logistic regression analyses were performed to identify factors significantly associated with taking one or more preventive measures. For each analysis, demographics, knowledge, antecedents (infection and vaccination) perceived severity, perceived vulnerability, response efficacy and perceived self efficacy were entered as predictor variables.

First a univariate analysis was performed using chi-squared tests or Fisher’s exact tests for categorical variables and Student’s t-test for normally distributed continuous data; non parametric test (Mann-Whitney) were used if appropriate. Univariate analyses were performed with self reported characteristics as independent variables and taking precautionary behaviour as the dependent variable. For the odds ratios, 95% confidence intervals (CI) were calculated. Second, for the multivariate regression analyses, all factors with a p-value <0.2 in the univariate analysis were entered in the multivariate model. The potential confounding factors (age) were included in our multivariate model. This model was fitted with a step-to-step backward elimination".

Moreover, we have created a new table (table 3) with the scores included in univariate and multivariate analyses.

Comment: "preventive attitudes is defined as at least one precaution had been taken, so shouldn’t it be preventive behavior?"
To compare our study to princeps articles in this field (Bults M et al: BMC Public Health 2011, 11; de Zwart O et al: BMC Infectious Diseases 2010, 10:114) we have chosen to use the same dependant variable. We have changed in our article "at least one precaution" into "one or more preventive measure".

RESULTS

Comment: 1e sentence to discussion?
We moved it as requested the first sentence ("The survey on perceived risks and preventive attitudes was conducted on average 2.5 months (SD 1.5) after the epidemic ended on Reunion Island) to the first alinea of discussion.

Question: "data available on socio demographic variables of whole RI population?"
We added this alinea " Our sample comprised a majority of women (73%) compared to the general Reunion island population, where 52% is female. Our sample comprised a majority of elderly people, 48% over 60 year olds versus 17% in general Reunion island population".

Question: "were household contacted once of more often?"
The protocol provides a number of calls expected to reach the household. In fact, it seems, as we wrote in the discussion, that the interviewers preferred home-based respondents, thereby limiting refusals but making the choice of the household’s reference person more difficult.

Question: "knowledge: give more detailed information, %, present data in table, number of respondents who reported at least one correct symptoms?"
More detailed information as requested added in the article "The main symptoms identified by respondents were (in decreasing order of frequency): fever (79%), aches and pains (53%), headaches (36%) and a running nose (25%)".
The number of respondents who reported at least one correct symptom was 632 out of 725 (87%).

Question: "differences in knowledge levels between socio-demographic subgroups?"
Actually, there are not significant differences in knowledge between socio-demographic subgroups.

Comment: "perceived severity and vulnerability: 3e alinea, describe more fully among women, levels of concern, severity scores etc how related higher levels of concern, perceived higher severity? Also add OR, 95%CI, p-values"
We added this sentence: "Perceived severity scored 6 (SD 3.05) on a scale of 0 to 10, whereas perceived vulnerability scored 5 (SD 3.67) on a scale of 0 to 10. Among women, perceived severity (60% versus 51%, OR 1.4, p = 0.03) was significantly higher than among men. This trend is also observed for severity score (6.3 versus 5.3, p = 0.001), vulnerability scores (5.7 versus 4.7, p < 0.001) and the estimated proportion of individuals infected by influenza A (H1N1) (means 33 versus 21, p < 0.001). Otherwise, these risk perception indicators did not vary with age".

Comment: effectiveness of preventive measures: "prevention was regarded as possible by most respondents.." In table yes/no answers are included. Unclear if yes/no scale was used of 5-point likert scale (certainly, possibly etc)"
Actually, we improved the description of the method as follow (alinea 9) "Response efficacy relates to the belief of people in the effectiveness of the available preventive measures was evaluated by the interviewer with two questions. First a general question with a dichotomous answer (yes or no) was asked "are there effective preventive measures to protect you from influenza A (H1N1)?". Second, a list of the recommended influenza A (H1N1) prevention measures was read (washing hands more frequently, getting vaccinated against seasonal influenza, wearing masks in public, avoiding public transport, avoiding crowded places, not sending children to school). The question was "which preventive measures among this list you think are effective at keeping you from getting the influenza A (H1N1)"

Comment: 2e sentence: individual preventive actions. Please include more specific results
A univariate analysis revealed that eight significant factors contributed to the precautions taken against influenza A (H1N1) (Table 1): 1) being a female, 2) vaccinated against seasonal influenza, 3) to have had influenza in the last five years, 4) higher perceived severity, 5) higher perceived vulnerability, 6) higher response efficacy, 7) higher perceived self efficacy, 8) higher number of preventive measures regarded as effective.

DISCUSSION

The fact that respondents have already participated to the chikungunya study probably has not affected this survey of SHS in so far as the chikungunya survey was a serological survey and non SHS survey.

Yes it is an added value because we have a great correlation between the answer concerning respondents infected by A influenza (H1N1) and seroconversion rate.

The survey was performed 2.5 months after the outbreak and recall bias is a possible limitation. It seems however that this bias was mitigated. Indeed, the survey shows a high level of participation that is due to pressure of the French media in Reunion Island. This reflects the expectation of the specific vaccination (H1N1) and the coming of the epidemic in the northern hemisphere in general and in France especially. On the other hand, as already mentioned, there is a good correlation between infected cases of influenza A H1N1 among respondents and their serological status (4). These explanatory factors are consistent with a low recall bias.

We referred to the literature on follow-up surveys to advance this hypothesis. We therefore can not make this assumption as such in the background and methodology; our methodology (cross-sectional survey after the epidemic) did not allow it.

We added (4 e alinea) this sentence "The survey was performed 2.5 months after the outbreak and recall bias is a possible limitation. It seems however that this bias was mitigated. Indeed, the survey shows a high level of participation that is due to pressure of the French media in Reunion Island. This reflects the expectation of the specific vaccination (H1N1) and the coming of the epidemic in the northern hemisphere in general and in France especially. On the other hand, as already mentioned, there is a good correlation between infected cases of influenza A H1N1 among respondents and their serological status (4). These explanatory factors are consistent with a low recall bias".

We added the reference (figure 3) in the text to give a detail of each preventive actions (%). We do not calculate means score for each preventive action. We only have a global score comprising all preventive action taken.

We inserted OR, 95% CI, p-values in a new table (table 2). And we changed the alinea into "A univariate analysis revealed that eight significant factors contributed to the precautions taken against influenza A (H1N1) (Table 1): 1) being a female, 2) vaccinated against seasonal influenza, 3) to have had influenza in the last five years, 4) higher perceived severity, 5) higher perceived vulnerability, 6) higher response efficacy, 7) higher perceived self efficacy, 8) higher number of preventive measures regarded as effective".

We gave more details in a new table (table 3). Score for the effectiveness of preventive measures is 3.15 among people who took precautions compared to 2.3 for people who did not take any precautions.
In the discussion, many references with similar results were found to confirm our results. Concerning the most important difference (precautionary of young people), we added "unlike other studies where elderly people are the most active [XI] [XII] [23]" in this sentence "Young adults (18-29 years) reported to be most active in terms of prevention unlike other studies where elderly people are the most active [XI] [XII] [23] (discussion).

Comment: "give more specific information about chikungunya epidemic (transmission route, causative agent etc)."

We added "(epidemic which came from East coast of Africa)" in this sentence in the background "In 2005-2006, an epidemic which came from East coast of Africa related to chikungunya, an alpha virus transmitted via a vector (Aedes Albopictus mosquito), had a major impact on public health and received extensive media coverage [9]."

Comment: "11e alinea: "severity is slightly overestimated by our sample", please explain."

As we wrote "Finally, the severity of influenza A (H1N1), although rated as moderate, was slightly overestimated by our sample owing to the fact that it contained a large proportion of women, a finding shared by other studies [23] [26]."

On the other hand, we improved the results for the perception of severity by women. Thus, as requested by you, we added the sentence in the result paragraph (7e alinea) "Among women, perceived severity (60% versus 51%, OR 1.4, p = 0.03) was significantly higher than among men. This trend is also observed for severity score (6.3 versus 5.3, p = 0.001), vulnerability scores (5.7 versus 4.7, p < 0.001) and the estimated proportion of individuals infected by influenza A (H1N1) (means 33 versus 21, p < 0.001).

Question: "12e alinea: what influence may have the potential selection bias on results?"

We added this sentence: "Analysis by sex and age group do not reveal a statistical significant differences except a higher perception of severity by women. However, selection bias (women and elderly over-represented) has simply revealed, in the multivariate analysis, the contrasted attitude of young people".

Comment: "Include refs to support the finding that "elderly people who are more exposed and sensitive to the harmful effects perceive higher severity"

We added "Elderly people could have overestimated severity of influenza A (H1N1) because influenza is known as an important cause of morbidity and mortality among elderly people [I]" and we added: one reference after this sentence "In our study, multivariate analysis showed also that vaccination against seasonal influenza seemed related to a more general preventive attitude as it was shown in other studies [X]."

Question: "was communication campaign launched to inform people about risk and measures?"

In the background we wrote "A local campaign emphasized regular hand washing and avoidance of contact with diseased persons".

In the discussion we added "local" in this sentence: "The number of preventive measures regarded as effective scored 3 (on a scale of 0 to 6), confirming good knowledge of preventive measures and confidence in the precautions suggested in the local prevention campaigns".

CONCLUSION

Comment: "recommendations for research, what this study adds, what is still unknown"

We added (page 10)

This research provides an illustration of the complexities of how people understand and respond to health messages related to the H1N1 pandemic [II]. Further qualitative researches must be implemented to adapt messages to social and cultural realities of the Reunion island populations and to prevent misconceptions.
FIGURES

Figure 1
Comment: "replace and insert a figure with n of cases/deaths and recommended measures and communication by government in timeline".
We cannot improve this figure because we do not have such information concerning number of deaths by week. As we said in the background, the raising major international concern over the risk of high mortality and morbidity have promoted the spread of prevention messages very early (before the outbreak).
We actually deleted this Figure 1

Figure 3
Comment:
- insert n of respondents (n=) in title
- title of figure is unclear, title should be "preventive measures taken"
The new title is "Preventive measures taken and found effective against the H1N1 virus (n=725)"

Figure 2
Comment:
- "give information about answer scale in footnote, not in title": ok
- "insert n of respondents": ok
- "what does the different colours means?": We deleted colours

TABLES

Table 1
Comment:
- unclear what is measured, what indicates p-value
- include also results of respondents who did not take preventive measures
- perceived severity/efficacy which answer scale used, see point above

Table 2
Comment: "present also results of univariate analysis in table"
Question: "score about the number of preventive measures, give details about answers?"

We totally refounded the previous table 1 in order to make clear and describe more precisely, in one hand the distribution of general characteristics of the population in a new table (table 1) and, in the other hand, factors associated with precautionary behaviours: new table 2 (quantitative continuous variables, score with means) and new table 3 (variables with frequency). The new table 4 gives information about the multivariate analysis.

QUALITY OF WRITTEN ENGLISH
Comment: "Not suitable for publication unless extensively edited"
The paper has been reviewed by an additional mother-tongue speaker, and substantial changes in form and grammar have been made.
Revisions requested by Prof. Marc Kiviniemi

Dear Pr. Kiviniemi

We made major revisions as requested. In addition to the corrections you requested, you have above (p. 2-10) a point-by-point response to the comment of the other reviewer.

FT

BACKGROUND
We Added: one sentence "and on the official specific actions being recommended" (following "Compliance with preventive measures, e.g. non-medical action, is dependent on the attitude and willingness of the population").

Comment: "For both general health behaviors and for influenza precautions specifically, there are relevant literatures which should be addressed in the introduction". In this perspective we have added some references:
We Added: three references after this sentence " Compliance with preventive measures, e.g. non-medical action, is dependent on the attitude and willingness of the population and on the official specific actions being recommended".
We Added: four references after this sentence " Precautionary behaviour results from a combination of a range of social and psychological factors such as personal values, socio-economic status and cultural background, gender, education, knowledge, and beliefs about the disease, including perceived risks and perceived effectiveness of the proposed action".
We Added: two references after this sentence " These factors may be specific to each population target and should be investigated to develop a local approach on the preventive messages to be communicated".
We Added: one reference after this sentence "The perceptions and reactions among the general public during pandemics helps to improve communication on health risks and to shift attitudes among the general public".

METHODS
Comment: The methods section needs to provide more detail about the measures used and needs to correspond to the measures actually reported in the results section. For example, the description of precaution efficacy in the methods section reads as though a single question was asked concerning efficacy of preventive actions, but the results section presents separate results for each preventive action. Similarly, the results section presents information concerning perceived risk for H1N1 relative to a number of other health problems, but assessment of perceived risk for other problems is not mentioned in the methods section.
We provided more details on this section in order to answer to this comment (see page 3-4). We took into account the given examples by the reviewer.

Comment: In the analysis section, it would be helpful to state specifically which research questions were answered using each analytic technique (e.g., in order to assess the relation between efficacy and engagement in precautionary behavior, a logistic regression was conducted....). Paragraph on statistical analysis has been revisited, completed and detailed in order to be more precise and clear.

RESULTS
Comment: "I think that addressing the question of what factors influence preventive action would be strengthened if the authors examined predictors of action separately for each precautionary behavior as opposed to looking at whether people did or did not take each action. There are two reasons for
this suggestion. First, the predictors may well differ across specific behaviors, and knowing that would be meaningful for both research and applied reasons. Second, the proportion of the population who took a precautionary action is so high (87%) that interpretation of differences by predictor becomes challenging”.

We have read your article (Kiviniemi M et ali: BMC Public Health 2011, 11:152) and have found your method highly interesting. Nevertheless, we are sorry, we cannot restart the analysis at this step of the article. The method we have used was the same developed in others articles in this field (Bults M et ali: BMC Public Health 2011, 11; de Zwart O et ali: BMC Infectious Diseases 2010, 10:114), with the same dependant variable: "taking one or more preventive measure" to compare our data. On the other hand, we added within limitation alinea (discussion) the following sentence "This lack of power of the statistical test is balanced by a high size of the sample and a high participation rate observed (95%)".

Comment: "In terms of rewriting, the authors should describe the results narratively and/or use tables/figures rather than bullet point lists. Also, I found Table 1 confusing for a couple of reasons. First, it wasn't clear what the percentages mean -- in the "overall sample" row they seem to indicate what percentage of the sample fell into each demographic category (e.g., 27% male, 73% female), but in the "taking one or more preventive measures" row it isn't at all clear what the percentages mean. Second, it isn't clear what the p-values in the right column refer to. A note at the bottom of the table clarifying is necessary and reworking the table so that percentages have the same meaning in each column should be considered to aid in reader comprehension’”.

We totally refounded the previous table 1 in order to make clear and describe more precisely, in one hand the distribution of general characteristics of the population in a new table (table 1) and, in the other hand, factors associated with precautionary behaviours: new table 2 (quantitative continuous variables, score with means) and new table 3 (variables with frequency). The new table 4 gives information about the multivariate analysis.

DISCUSSION
Comment: "Some of the conclusions drawn seem problematic given the study design and measures. Two key problems are: a) the authors conclude that having previously gotten a seasonal flu vaccination leads to engaging in precautionary behaviors. There is a statistical relation between these two measures, but it seems conceptually much more likely that the relation exists because of underlying individual differences in likelihood of engaging in precautionary behaviors".

Actually, in our article we do not conclude we just suggest. We hope multivariate analysis is efficient enough to take into account the confusion variables. As you mentioned indeed, we could not exclude statistical bias. Probably, in our analysis, it could not be the age factor because elderly people were most vaccinated but less inclined to take precaution.

We added a reference "Brewer et ali: Meta-analysis of the relationship between risk perception and health behavior: The example of vaccination. Health Psychology 2007, 26: 136-145” to support our result.

"b) the authors report in the discussion section that "knowledge...decreased over time". It isn't clear which results that statement refers to or how that conclusion can be drawn from a cross-sectional study”.

We used this statement from a study conducted by Zwart et al. In our article, we now mentioned this reference clearly. The sentence is now as follow in our discussion: "Zwart et al showed on a follow-up online survey during the 2009 Influenza A (H1N1) pandemic that knowledge decreased over time indicating the need to keep the public continually well informed, especially about which measures will be effective, since a substantial number of respondents took non-effective measures [13].
QUALITY OF WRITTEN ENGLISH

Comment: "Needs some language corrections before being published"

The paper has been reviewed by an additional mother-tongue speaker, and substantial changes in form and grammar have been made.