Author's response to reviews

Title: Early warning detection of heat wave morbidity using syndromic surveillance in emergency departments.

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Author's response to reviews:

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To Dr Hans Zauner Senior Assistant Editor of BMC-series journals

Dear Editor,

Enclosed please find a revised copy of the manuscript entitled, "Early warning detection of heat wave morbidity using syndromic surveillance in emergency departments" that we had formally submitting to BMC Medical Informatics and Decision Making for publication. We truly appreciated the comments of the reviewers which helped us to improve our paper.

We add to this letter a complete answer point by point to all reviewers’ comments.

We look forward reading from you. Thank you kindly for your consideration.

Yours truly,

Loïc Josseran, MD, MPH

Review Julie Pavlin

Major Compulsory Revisions

Recheck statistics or numbers for hypoglycemia in Table 2 - how could a change in daily mean number of visits from 7.3 to 0.7 not be statistically significant? Are
the numbers wrong?
The table has been modified in order to correct this point, it was a mistake.

Minor Essential Revisions
4th sentence in "definitions of heat wave and alert period" - the phrase "...for each French administrative department and stand for each department." needs to be reworded.
The text has been modified in order to clarify this point;

Remove repeated data regarding daily mean number of hospitalizations for nonelderly vs. elderly in the first paragraph of results.
The text has been modified in order to clarify this point;

Last sentence of results. Is this incomplete? "during ONAP compareD to OFAP" but then just gives a percentage for elderly and younder adults - where is the comparison? If it didn't change between ONAP and OFAP, then you should state that and just give the one percentage.
We have decided to withdraw the sentence, not very understanble, which finally bring nothing to the paper.

Rephrase sentence in 3rd paragraph of discussion: "As reported by others, cardiovascular mortality increases during a heat wave." By saying "it is known that" - means it is really true, yet yours' and others' data refute it.
The text has been modified in order to clarify this point

Discretionary Revisions
It would be nice in the background to have a few more sentences on the national heat wave health alert system. You state that it worked and was effective for early warning - how early, what was changed because of it, etc.? And how is the syndromic surveillance portion of this system constructed (so that we can compare this system to your proposed refined system)?
The following text has been added in the background section
"Since summer 2004, the French Institute for Public Health Surveillance, in close cooperation with Météo France defined and implemented a heat health watch warning system on the basis of biometerological indicators. The warning system operates from 1st June to 31st August (level 1, seasonal surveillance period). When the alert criteria are fulfilled, an awareness and action level is declared by the Préfet (level 2) who manages the département (French administrative unit). A third level (maximum mobilization) is implemented if the impacts of heat wave overwhelm the health field: power cuts, drought, management problems in the funeral centres and heavy air pollution.
The alert system aims to give the public authorities 3 days’ prior warning that a heat wave may occur, in order for the National Heat Wave Plan measures to be
put into operation. The preventive measures are aimed at modifying the behaviour of people, health institution and health authorities with regard to high summer temperatures [7, 8]."

Please define "soon" at the end of the second paragraph of the results - one day, two days? It really isn't that readily apparent in the figure.
The text has been modified in order to clarify this point;

May want to add in a 7 day moving average line in the figure to demonstrate more clearly the increase in both temp and number of visits in fig 1.
The figure has been modified and a 7 day moving average added.

You don’t use HWDS abbreviation in figure 1 - although you probably should - instead of just labeling the purple line "Indicator" you could call it HWDS Indicator, which would be a better description.
The legend has been modified in order to clarify this point.

Of course, the weakness in almost all syndromic surveillance manuscripts is the "so what" factor. It would be good to strengthen your discussion by adding in a little on how it is better than just looking at temperature increases (which seems obvious with heat injuries). Can tie in to expanded background on the currently existing system and how your refinement of codes, etc. can improve that even more.
We made some changes in the last paragraph in order to answer to this comment.

Review Sari Kovats
The data for analyses is limited (less than one year) and so it is difficult to interpret the results based on a single heatwave event.
We are agree with the reviewer, historical data are limited and the analyzed event is also limited to a single heat wave. Unfortunalty electronic data were not available from ED before summer 2004 (ED were not equipped with appropriate software and computers) and 2006 is the only heat wave experimented in France since 2003.

The introduction could describe in more detail how syndromic/health surveillance is used in the current France NHWP (national heatwave plan) – and how this paper adds to current practice. It would be very useful to discuss how ED data compare as surveillance tool to mortality data, or to temperature alone?
“Since summer 2004, the French Institute for Public Health Surveillance, in close cooperation with Météo France defined and implemented a heat health watch warning system on the basis of biometerological indicators. The warning system operates from 1st June to 31st August (level 1, seasonal surveillance period). When the alert criteria are fulfilled, an awareness and action level is declared by
the Préfet (level 2) who manages the département (French administrative unit). A third level (maximum mobilization) is implemented if the impacts of heat wave overwhelm the health field: power cuts, drought, management problems in the funeral centres and heavy air pollution.

The alert system aims to give the public authorities 3 days’ prior warning that a heat wave may occur, in order for the National Heat Wave Plan measures to be put into operation. The preventive measures are aimed at modifying the behaviour of people, health institution and health authorities with regard to high summer temperatures [7, 8]."

We also added a section in the discussion about the interest of ED data compared to mortality data and temperature.

Some attention to language is needed here – the statement at the end of page 4 needs to be clarified. It is important to note that there is very little evaluation of the effectiveness of heat wave plans or heat wave alert systems. Ref 8 is about meteorology and so it is not clear how the system “proved itself to be truly effective”.

We are agree with the reviewer there is a very limited work done about evaluation of the effectiveness of heat wave plans or heat wave alert systems. The statement here was just about capability of the heat wave alert system to identify properly hot periods 3 days prior. It is why the reference 8 is about meteorology.

In the methods- it is not clear how the on alert periods were defined – using the single national series or the city-specific thresholds (which were based on mortality ?), if the latter, then were the on alert periods also city specific?

The text has been modified in order to clarify this point;

Results – It is not clear why renal failure or renal colic are recommended as indicators when there is not a big effect of the heatwave on admissions.

We found a significant difference between the ONAP and OFAP for those 2 syndromes. It is why we selected them moreover they are frequently associated to health impact of hot weather in other publications. And last but not least, it would be difficult to explain why we did not take them into account even if there is not a big effect.

Review Anna Pavlin
Definition of syndromes and age groups and statistical analysis suggest to describe the studied age groups as adults younger than 75 years (<75) and 75 years and older (>75).

This description should be used consequently in the text and in the tables. Although the impact is bigger in the elder group, I suggest to rearrange the tables in this grouping.

The text has been modified in order to clarify this point;
Symptoms definition: the authors use the expression „malaise” in the text and tables. The ICD-10 codes are given for this item. As it contains three different codes, it is advisable to give the official definitions belonging to the three different codes in table 1.
Table 1, we added for each code its definition.

Table 2
In the headings I suggest to add daily mean number
This notion was present in the first version submitted

Table 3
I suggest to change the columns: first the younger age group, than the elder.
Please correct the description of age groups as suggested earlier
Tables have been modified

Table 4
As the numbers and proportions of the ONAP period is of greater importance, I suggest putting the asterisk indicating the significant differences to this column.
Table has been modified

In the headings please use consequently the definition of age groups Fig 1 I suppose there is a typing error in the title: Evaluation (instead of evolution) should be the correct term
The title is EVOLUTION and not EVALUATION. The objective was to show how the indicator moves following the temperatures evolution.

The authors stated that the initial exposure to high ambient temperature has a direct impact on health with temperature peaks in mid June and the first days of July. Thus the full effects of a heat wave only appear 3-4 days after it has begun.
I do not feel a logical connection with the impact of early heat waves and the lag effect. Please explain this assumption a bit more thoroughly.
Further, more explanation is desirable how the preventive measures helped this adaptation, bearing in mind that a 3-day lag effect was also observed in 2003, before the national heat wave plan was introduced.
In 2003, patient diagnosis after emergency admission was not recorded electronically in routine in France. ED Data presented here have been recorded electronically in routine since the summer 2004. Therefore we are not able to evaluated a possible 3 day lags in 2003 about morbidity. Futhermore, the possible and positive effect of preventive measures has been evocated by others in published articles. We trust in this hypothesis because when high temperatures are just under threshold a health impact is measurable and when temperatures are over threshold the health impact falls suddenly of the
preventive measures. are launched during the first days weather is close

In par 3 you mentioned that „Also in agreement with other findings (14, 21) our results show that hot weather does not affect cardiovascular morbidity“. There is a publication of Schwartz et al (2004.) reporting an association between hot weather and hospital admission due to cardiovascular morbidity. I suggest to consider to cite this contradictory result as well.


We read with a great attention, the article cited by the reviewer. The result of the article described an increase of heart diseases during hot temperature. Nevertheless, the RR is not significant (1.15 ; 0.96 – 1.39). We are agree to add this recommended reference as point discussed in the international literature, but for us this article did not demonstrate clearly a significant impact of hot weather on cardiovascular disease which is close to our results.

Page 10 par 3 In this par you discussed the possible effect of „heat islands“. You supposed that the results you found are valid for both large and small cities. This statement would need further explanation. Please consider this remark. Further you mention: since the complete automation of data transmission is crucial, not all emergency departments record all of the information per visit which creates an information deficit.

The text has been modified in order to clarify this point. In this paragraph the idea was to explain that because hospitals are in cities we probably described the impact of the heat wave in cities. Therefore our results are may be not valid for rural area for example.

If you mention this problem, I would advise to give some descriptive data, how big was the information deficit in your database. Of course this descriptive data should be included in the „Result” part of the paper. Here you need to refer to this data.

The modification in the text has been done. Elements have been added in the methods section and in the results.