Author's response to reviews

Title: An evaluation of a tailored intervention to enhance village doctors use of electronic health records

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Author's response to reviews: see over
Dear Sir

Re: An online evaluation of a tailored intervention study on village doctors use of electronic health records
(Previous MS: 2077977687112547)

Thank you for providing the reviewers comments and reconsidering this paper.

Attached is a revision of the paper and below is a response to each of the points raised by the reviewers.

Yours sincerely

Mark Harris
On behalf of the authors.
28 March 2014
Response to Reviewer: Kamala Thriemer

Review
This is generally an interesting paper documenting the need for constant support in the introduction of electronic health records in China. However the paper needs major review to clarify methodologies used and make the reader understand how the results were obtained. I would also encourage the authors to have the manuscript reviewed by a native English speaker (e.g. the last author?).

Answer: Thank you. The paper has been edited by an English speaker.

General comments:
• “Personnel intervention” – I would suggest to rephrase this to e.g. “educational intervention for health care staff” or something similar. It easily misreads as “personal intervention” and is therefore misleading.
  Answer: We have deleted “personnel”. Actually “intervention” included three aspects which were tailored to the needs of village doctors- education, on site supervision and technical support. Please see page 6 “intervention”.

• The word “trial group” should be replaced by “intervention group” Introduction:
  Answer: Yes, we have changed all “trial group” to “intervention group”.

• The phrase “Especially in depressed rural areas, doctors are often unwilling to use EHR due to insufficient understanding of its importance and a lack of skill in its operation” needs a reference since this is the rationale to do the study
  Answer: Before this study, we carried out another study (The Pilot Research of Improving Rural PHC through Community Health Service in Depressed Area, HSS15). In that study, we identified these problems and according to the result of that study we applied this project successfully. On page 4, we added two references (4 and 5).

• The last sentence of the introduction should include what the intervention was, e.g. “education”, “training”, “support”. Otherwise the reader is left in the dark what you were actually doing.
  Answer: Yes, we have added an explanation of the intervention on page 5 first paragraph.

Methods:
• It is unclear to the reader what the questionnaires were about. The results presented later seem to be derived from an evaluation/extraction of the actual electronic health records. The authors have to clarify therefore
  • what kind of data the questionnaires/interviews collected
  • who was interviewed (e.g. head of household)
  • what data that is presented was retrieved from the electronic record system itself and what data from the questionnaire
Answer: We have changed this to a “record form” rather than “questionnaire”. The record form mainly includes the basic personal information, health examination records, health education records, vaccinate records, health management records of children, the elderly and basic clinic records in EHR. This was used to collect the information online. No data was collected by interview or questionnaire.

- I wonder about the reason to compare only two community health service units? The authors should be aware that there are inherent problems when comparing the results from the two units. Basically it is very hard to separate variability due to the intervention (what we want to see) from the variability due to differences in the experimental units (what we don’t want to see). It would have been nice to have a bigger number of health units in the intervention and the control arm. The authors should mention this in the limitation section.

Answer: We chose 10 townships as sample townships. Each sample township we choose 2 similar Community Health Service Stations (CHSS) and randomly located one as intervention group and the other as control group. Thus in total we had 10 CHS in the intervention group and 10 CHSS in the control group. In each sample CHSS, we choose 20 families. In total we had 400 families. We have mentioned that a relatively small sample of households was the paper’s limitation.

- It might be good to mention how you came up with the sample size for the records you extracted/families included.

Answer: We powered the sample size according to the health examination rate as a key index on pre-survey. The minimum sample size was less than 400 for each group. Actually the sample size was over 700 for each group.

- The method section should describe in more detail how the intervention was performed (e.g. group discussion or face to face teaching, time spent on retraining, supervision also between the monthly visits?) It might be good to add a table and/or supplementary file with the detailed training program including the number of trainers and trainees etc)

Answer: We modified the intervention part. Please see page 6 “Intervention”.

Results & Discussion
Streamlined according to the revision made in the methods section

Answer: Yes, we have modified these parts according to the revision made in the methods section.

Minor Essential
- Also it might be good to explain how the control group was observed. Where there also monthly visits? Or was data only extracted from the health records without further interaction. If there was interaction and the health staff was aware of being observed this might be a reason why for some of the variables we also see significant increases in the control group.
Answer: The control group was not given the intervention but received parallel observation online, please see page 7. We have given explanation about some significant increases in the control group, please see “Discussion”.
Response to Reviewer: Rosa Lau

Minor essential revisions
Clarity of the paper needs to be improved.
This is not a randomized controlled trial, therefore should avoid using the word "trial". Instead, use the word "intervention", e.g. intervention participants or intervention group.

Answer: We chose 10 townships as sample townships. In each township we chose 2 similar Community Health Service Stations (CHSS) and randomly located one to the intervention group and the other to the control group. We have changed “trial group” to “intervention group”.

Discretionary revisions

Was theoretical framework considered in your research?

Answer: This was an effectiveness trial. The intervention was informed by previous experience with quality improvement programs in China and internationally with included education with local supervision and support provided on site. However we did not use a formal theoretical framework in the design of the intervention with village doctors.

Title/abstract

Major compulsory revisions
The title lacks clarity - this is essentially an educational intervention targeted at health care professionals (delivered by primary health care personnel)
Suggestive title: The effects of an educational intervention on the use of EHRs among village doctors: a pilot study
Answer: The intervention included three components education, onsite supervision and tailored technical support (see page 6). We have deleted “personnel”.

The term "online evaluation" in the title is somewhat ambiguous, was the evaluation carried out via an online questionnaire?
Answer: Actually the members’ information of these families (at baseline 1451 residents, at follow up 1467 residents) were collected by the investigators using an form from the online records. The evaluation was based on the record forms. Please see page 6 - page 7 “data collection”.

Abstract - need to specify what the outcome measures were, and when they were measured, i.e. baseline and end of 6 months.
Answer: Yes, outcome measures were basic personal information, health examination records, health education records, vaccinate records, health management records of children, the elderly and basic clinic records in EHR all residents assigned. It also included average time of children’s health visits. Please see page 6 - page 7 “data collection”.
Introduction
Minor essential revisions
Page 4 line 3 - correct abbreviation for electronic health records, EHR not HER. 
Answer: Yes, we have modified.

Page 4 line 9 - the term "the use of" was repeated - delete as appropriate
Answer: Yes, we have modified.

Methods
Major compulsory revisions
Authors stated the townships were selected on the basis of their size and the background and training or experience of the doctors - how (please clarify).
Answer: Ten of the 15 townships in Chongyi County were chosen as research sites, on the basis of their size of population. Two similar Community Health Services Station (CHSS) were chosen from each of these 10 townships based on village doctors’ background and training. Please see page 6 “Methods (Study population and sample)”.

"...two similar community health services were chosen”. This needs further clarification, what does it mean by "similar"?
Answer: Two adjacent similar Community Health Service Stations (CHSS) were chosen from each of these 10 townships based on village doctors’ education and training background, similar age and service population. Please see page 6.

Insufficient details were given with regard to the intervention.
Answer: We have provided more details. Please see page 6 “intervention”.

Define personnel intervention - is it the same as educational intervention?
Answer: We have changed “personnel” to “tailored”. The intervention was tailored to the doctor’s and CHSS circumstances and needs. Please see page 6 “intervention”.

What does the intervention involve? Demonstration? Practice? Discussion? One to one session vs. small group session?
Answer: The intervention involved three aspects:- supervision visits to check on the quality of the village doctor’s work with the EHR (including observation of recording and examination of the record; providing technical support about how to use EHR tailored the village doctors’ circumstances and needs and solving problems that they encountered in the process of using EHR; face to face education about EHR policies and benefits, including practical training in the proactive and timely use of EHR. Please see page 6 “intervention”.

The authors specified the duration of the intervention (6 months), but not the number of sessions. Frequency and intensity were unclear, e.g. an hourly session each week.
Answer: The intervention was carried out once a month. Please see page 6 “Intervention”.


Suggestive text: participants in the intervention group received a 6- month training, which comprised x, y and z.
Answer: We have modified 6- month training to 6- month intervention. Please see page 6 “Intervention”.

Minor essential revisions
It may be useful to explain further on the following:
Describe more about personalized guidance (tailored? ).
Answer: We have modified the paragraph about the intervention. Please see page 6 “Intervention”.

Proactive - example? Did the intervention involve practicals/ feedback sessions?
Answer: We have modified the paragraph about the intervention. Please see page 6 “Intervention”.

Was it an online survey/ questionnaire? What questions were asked in the questionnaire?
Answer: It was an examination of the online record. Please see page 6 - page 7 “data collection”.

Specify primary and secondary outcome measures.
Answer: Page 7 line 8. The primary outcome measures include the integrity of the basic personal information, health examination records, health education records, vaccinate records, health management records of children, the elderly and basic clinic records. It also included average time of children’s health visits. The secondary outcome measures were the percentile and average of the task achievement of primary outcome measures. Please see page 6 - page 7 “data collection” and table 2 – table 5.

Data analysis

Major essential revisions
Describe the type of baseline demographic characteristics data included.
Answer: It included gender and age. Please see page 9 “demographic analysis” and table 1.

This section needs to be described in more detail, e.g. independent sample t-test for continuous variables, and Chi square test for categorical variables.
Answer: We have provided more detail. Please see page 7 “Statistics analysis”.

Define statistical significance, e.g. a two-sided p values <.05.
Answer: Please see page 7 “Statistics analysis”.

Discretionary revisions
No information on power calculation - was it carried out?
Answer: An a priori power calculation was not carried out.
Results
Major essential revisions
Baseline information
Any additional information such as practice size, years of practice experience, age of doctor etc. These characteristics information could have influenced outcomes (i.e. doctors’ use of EHR)
Answer: When we selected two comparable CHSSs for randomisation to intervention or control, we considered the doctors’ education background and practice time. Please see page 6 “Study population and sample” and page 12 “Research quality”.

Minor essential revisions
Results on vaccination and health management records in children were based on small sample size. Therefore, results need to be interpreted with caution.
Answer: In limitations we have said “this study was conducted with a relatively small sample of households in one rural county and thus the findings should be generalized to other areas with caution.” Please see page 13.

Discussion
Minor essential revisions
Page 10 line 9, typo - at present, "in" developed countries.
Answer: We have modified this.

Page 10 last line - "less" developed areas, instead of undeveloped areas.
Answer: We have modified this.

No reference to other relevant (similar) work was made - how is the finding of the present study compared to published literature?
Answer: We have made a modification. Please see page 13 “Public health records”.

Discussion about the reasons medical staff were reluctant to use EHR - no reference(s) included.
Answer: Please see page 12, basic information of using EHR--the second paragraph.

Conclusions
Minor essential revisions
Suggest further research - replicate the study including more sites/ larger sample size, using different methodology e.g. cluster RCT.
Answer: Thank you. We have accepted your suggestion, please see “Conclusion”.

Tables
Minor essential revisions
Highlight statistical significance in tables (e.g. in bold, italics, or insert asterisk) and insert footnotes (e.g. p<0.05; p<0.00)
Answer: Thank you for your suggestion. We have modified this.

When indicating sample size in table, it would be useful to put (N=X).
Answer: Thank you for your suggestion. We have modified this.
Response to Reviewer: Barbara Castelnuovo

Electronic medical records are increasingly becoming important in resource constrained settings in improving medical health systems and increasing quality of care. Nevertheless, as the authors discuss, health care providers are frequently reluctant to use EMR, or the utilization is suboptimal. In this article the investigators explore the effect of a training and supervision intervention to enhance the use of EMR in a rural setting in China.

Major comments
General
The language should be revised. The authors should also revise the way information is provided in the different sections to improve the quality of the manuscript, see details below.

Methods
1) State clearly the study design at the beginning. It is not clear how the facilities were allocated/randomized to the intervention. Sampling: how the number 20 was chosen in regard of the families to be surveyed in each group?
   Answer: We have clarified this in the paper. Please see page 6 – page 7 “Study population and sample and Data collection”.

2) The groups should be referred as “intervention” group (and not trial group) and control group, since both groups were included in the trial and analysis
   Answer: Yes, we have changed “trial group” to “intervention group”.

   The section under “data collection” seems to be describing the study design and should be moved to the description of the study design, while the authors should give details on how the completeness of health medical records was assessed and by who, and what was use as a data collection tool. One of the main weaknesses of the manuscript is that it is not clear which are the main variables of interest and how were chosen (demographics, physical examination, vaccination, elderly). Maybe it would be useful to add at the beginning of the method section a paragraph describing EMR and what they are used for. The quality control section should be under data management and not standing by its own.
   Answer: We added what record form included. Please see page 6 “data collection”. We have introduced EHR in “Introduction”. Please see page 4.

3) Ethics: were subject consented?
   Answer: Yes, the study had been approved by the Human Research Ethics Committee of Nanchang University and village doctors gave consent.

Results
Demographics. Majority of the information should be omitted by pointing out that there were no differences and referring to the table.
Answer: Yes, we have modified the section according to your suggestion. Please see page 9 “demographic analysis”.

The remaining part of the results should be re-written to allow the reader to follow without difficulties. This is also due to the fact that part of the methodology is not clear Discussion.

**Answer:** We have modified “Methods and Results”.

It needs extensive re-writing. It seems to me form the results that despite statistically significant differences before and after the intervention, EMR are underutilized even after the intervention (e.g. health education, basic health information). Consequently I strongly disagree with the conclusion, as it seems this intervention is not enough effective.

**Answer:** Thank you for your evaluation. Behaviour change is a difficult process. We could not expect doctors to change so much during a short period. Most rural doctors were reluctant to use EHR. After the intervention, this changed significantly. In absolute numerical terms the change was relatively small. However incremental change is still important. Thus we consider the intervention was effective.
Response to Reviewer: Alexander Hoerbst

The paper describes a study related to the changes in the use (completeness of the record) of Electronic Health Records when training and support is offered to doctors compared to the use of doctors where no training and support is offered.

***************Major Compulsory Revisions***************

Abstract
*A sample 20 families…—> English
Answer: We have corrected this.

Introduction
*(CAHFF), project team carried out a piloty study…—> English
Answer: We have changed “piloty” to “pilot”.

*The objective at the end of the introduction is unclear: I would not use the term intervention. I would rather state what was actually done e.g. training. What is online data? I think this is ambiguous. Does this refer to the EHR data or …?
Answer: Thank you for your opinion. We have modified in the last paragraph of “Introduction”. Please see page 5. The intervention included supervision, technical support and education to doctors. It was not just education. The online data was from the EHR.

-------- Remark: Please have the paper checked by a native speaker. Due to the number of mistakes I stopped to state them. --------
Answer: This has been done.

Methods
* Study population and sample: You state that 10 townships were selected based on their size and village doctors’ background etc. Please state the exact parameters as well as their values. I am especially interested on the parameter village doctors’ background as I think this is difficult to standardize. Which CHS were chosen? How were the CHS selected (attributes)? How were the families selected (attributes)? In simple words, change the paragraph so that your decisions can be traced and reproduced.
Answer: Based on your advice, we have modified the paragraph “Study population and sample”. Please see page 5. The doctors’ background refers to their age, education and training. In Chongyi county most rural doctors’ educational attainment is at technical secondary school level. The length of their medical training is the same. In Chongyi County, the CHSS usually have just one doctor. When we chose the doctor, we chose the CHSS.

* Intervention: Who was exactly part of the intervention team? How can you be sure that there are no dependencies between the CHSS and/or doctors and the intervention team (e.g. experts from the county health bureau)?
Answer: The team comprised public health experts, software experts, and County health bureau officials. This visited the CHSS once a month. Public health experts
were from School of Public Health, Nanchang University. Software experts were from a large software company in China developing the EHR software. Please see page 6, paragraph “Intervention”.

* How was the raw data processed?
Answer: The information on family members’ (at baseline 1451 residents, at follow up 1467 residents) was collected from the online record using a form by investigators. SPSS19.0 was used to sort and analyse the data. Chi-square tests were used to estimate the difference of gender and age of Respondents before and after the intervention. Mann-Whitney U test was performed to determine significance. A two-sided significance level was set at p<0.05 for all tests. Please see page 7 “Statistics analysis”.

* What is also missing is a description of how you deal with influencing factors such as the availability and accessibility of PCs or the age of doctors in the samples.
Answer: The PCs in CHSSs were provided by government and they were the same in all CHSSs in Chongyi County. We chose pairs of doctors of similar age. Please see page 12 “Research quality”.

* State what kind of treatment (TCM or Western Medicine).
Answer: In Chinese rural areas, rural doctors usually treat patients both with western medicine and TCM.

Results
* When you refer to a complete EHR record, what does this include? What is the content of the EHR? You should also state a definition for an EHR - maybe not in the results section but in the introduction - as it is unclear if you refer to the concept of an EHR or a certain EHR system.
Answer: We added a concept about EHR in “Introduction”. Please see page 4. We have modified “data collection”. Please see page 6, “data collection”.

* There is not much value in describing the changes in the content of the record when the total content of the EHR is not described. You also need to describe the training otherwise the effect of the training can’t be traced to a more complete record.
Answer: This article evaluates the effect of the pilot intervention on EHR use. The evaluation outcome measures were the use of the EHR. We analysed the change in recorded information in the EHR in response to the intervention. We provided more details in the paragraph of “Intervention”, please see page 6.

* Health management of the elderly: It is not enough to state that there was an increase in the completeness of records. This is of no value to the reader.
Answer: The recording of health examinations and elderly health management improved both in intervention group and control group. Chongyi county government regularly organized residents to have physical examinations and the results were entered into the EHR.

* In your tables you have the categories ‘No’, ‘Part’ and ‘Full’. These categories need to be defined.
Answer: Evaluation of these indicators is based on integrity of the case file records last time. If the records were 80% complete or above, we called it ‘Full’. If it was less than 80%, we called it ‘Part’. If it not present, we called it ‘No’. Please see page 6, “Data collection” the second paragraph.

Discussion
* In your paper you just state that there was an increase in completeness of records. What were the reasons for this? The training, maybe being observed, being reminded, ….. Although you provide some ideas in your discussion, has there been a formal analysis of the reasons?
Answer: Thank you for your suggestion. We modified “Discussion”, please see the discussion paragraph 1.

What would have been interesting: analyse the use after the training. Is the rate still high?
Answer: We carried out the final survey after intervention in March 2012. General speaking, many public health and basic clinic records were improved in the intervention group while little change in control group after training.

Conclusion
* You state that with little effort the situation could be improved. I doubt that, as from my experience the effect of such an intervention decreases right away after it is completed. I think one time training does not have a sustainable effect.
Answer: We meant that the form of intervention was not very complex. We agree that it is not an easy and that it is difficult to sustain. We have modified the conclusion.

Conflict of interest
* You state that there is no financial conflict of interest. Are there any other conflicts of interest?
Answer: The authors declare that they have no conflicts of interest in this research