

## 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>	Changing community health service delivery in economically less developed rural areas in China: impact on service use and satisfaction.
<b>AUTHORS</b>	liu, yong; Zhaokang, Yuan; Yuxi, Liu; Jayasinghe, Upali; Harris, Mark

### VERSION 1 - REVIEW

<b>REVIEWER</b>	John Furler University of Melbourne Australia  I have collaborated with Professor Mark Harris in the past and have published one paper together with Upali Jayasinghe
<b>REVIEW RETURNED</b>	22-Oct-2013

<b>GENERAL COMMENTS</b>	<p>Re the intervention, could it be made a bit clearer when it was delivered and over what time frame in relation to the surveys?</p> <p>This is a well written paper, nicely described and the authors make reasonable claims based on the findings</p> <p>The (just) statistically significant increase in satisfaction with patient centred care in the intervention sites is noted but could the authors comment on how significant this might be in practical terms</p> <p>The strikingly different baseline childhood immunisation rates between the intervention and control sites suggests something different about the health services for the communities at baseline. Would the authors be able to comment on this?</p>
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<b>REVIEWER</b>	Duncan Maru Brigham and Women's Hospital Division of Global Health Equity Boston Children's Hospital Nyaya Health
<b>REVIEW RETURNED</b>	25-Nov-2013

<b>GENERAL COMMENTS</b>	<p>Title: -“Depressed” rural areas seems misleading, as if the paper was going to be discussing mental health. Choose a synonym to describe the economic condition of rural China.</p> <p>Introduction: -Paragraph 1 is lacking citations as the claims made in sentences 2/3/4 are unsubstantiated. -Paragraph 2; “but they have achieved some good results”- try to</p>
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	<p>find a more academic substitute for “good”, which is vague.</p> <p>-Paragraph 3, “recently, incentives...”- can you further describe what incentives you are referring to?</p> <p>Methods:</p> <p>-Can you provide any descriptive public health statistics for Chongyi County/Luxi County; eg. life expectancy, infant mortality? This would complement the descriptive economic statistics used.</p> <p>-Chongyi and Luxi counties seem to be of very different population sizes (1474 households versus 587 households respectively). Although study limitations are discussed in the discussion section, it should also be noted that this difference in scale may also be a confounding factor for this study and may weaken the statistical power of the study.</p> <p>Analysis:</p> <p>-I don't see any independent t test (for continuous variable ) samples calculated??? Am I missing this?</p> <p>Results:</p> <p>The major finding according to the authors is the patient satisfaction outcomes where the intervention group had a patient satisfaction score increase from 21.4% to 22.1% with tight 95% confidence intervals, a change of .7% while the control group saw “no change” with 20.6 to 21.4% (with broader confidence intervals). I understand that the p value is <math>p &lt; .006</math> and that because of the confidence interval variation that the statistics may view this as a significant finding yet, to me, a satisfaction increase of 21.4 to 22.1% does not seem to be of meaningful difference from a clinical/policy perspective. Furthermore, it appears as though there is a discrepancy between the results section of the paper and the supplemental data table regarding the control groups' data on patient satisfaction (the results section shows a change of 20.6% -&gt;21.4% while the supplemental data table says 20.6% -&gt;20.2%). Considering that this is one of the major findings emphasized in the discussion and conclusion, I think the emphasis is overstated, unless my understanding of the data is incorrect here.</p> <p>Discussion:</p> <p>-Some of the findings from the data seem to be misrepresented to me. The immunization coverage in Chongyi county village clinics increased between 2009-&gt;2010 (42.5% -&gt; 59.2%) whereas it decreased in Luxi county village clinics (16.5%-&gt;6.0%). This seems understated in the discussion while the patient satisfaction changes seemed overstated.</p> <p>-I would like to see more discussion about how this piece contributes to the current research literature; does it build on other studies, does it fill a research void, what research questions arise as a result of this study?</p>
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	<p>Conclusion:          -“Improvements in acceptability” seems like an incorrect word choice to summarize the findings considering that the overall use of services did not seem to change over the intervention period between the two counties.          Overall:          -Minor grammatical errors throughout the document, although these do not detract from the overall research findings.          -It appears that the intervention discussed in this paper is identical to the intervention from the following study:          Zhaokang, Yuan, Liu Yuxi, Liu Yong, Xiao Yunchang, Guo Yuanjun, and Mark Harris. 2012. “A Model for Community Health Service Development in Depressed Rural Areas in China.” BMC Health Services Research 12 (1): 465. doi:10.1186/1472-6963-12-465.          This paper under review presents additional quantitative data including multivariable data analysis and more variables. However, the research question of both articles appears to be the same, namely “what is the effect of this intervention on service utilization”. This raises questions regarding whether or not this is a redundant publication. Further clarification should be provided by the authors to differentiate this article from the mentioned BMC Health Services Research article.          Recommendation:          Accept pending clarification around the redundancy of publication.          Minor revisions before accepting:          -Clarify how this article is different from the BMC Health Services article          -Correct minor grammatical changes throughout the article          -Revise overall research conclusions to align with results justified by data          -Change title of article by replacing “depressed” with synonym to describe the economic situation of rural China.</p>
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<b>REVIEWER</b>	Ross Bailie Menzies School of Health Research Australia
<b>REVIEW RETURNED</b>	07-Dec-2013

<b>GENERAL COMMENTS</b>	<p>This is an interesting evaluation of a health service development initiative in rural China. A number of points in the methods, results and interpretation need to be addressed before the paper could be considered suitable for publication.</p> <p><b>Page 3 of 30, at Data collection:</b></p>
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	<p>“Surveys”</p> <p>Include reference to sample</p> <p><b>Page 4 of 30, 8th and 9<sup>th</sup> line of the section Results:</b></p> <p><i>“whereas this decreased in comparison villages...”</i></p> <p>What are the likely explanations for the decline?</p> <p><b>Page 9 of 30, 4<sup>th</sup> line under section 2.1 Study population and sample:</b></p> <p><i>“In each township, 3 administrative villages were selected...”</i></p> <p>Clarify if selection was random or not.</p> <p><b>Page 10 of 30, at section (4) Improving access to PHC:</b></p> <p>It is not clear from the explanation that the strategies listed in this program are about improving access. Please clarify.</p> <p><b>Page 10 of 30, lines 1-5 under section (4) Improving access to PHC):</b></p> <p><i>“carry out effective primary health care”; and</i></p> <p><i>“The policies included funding for repair or refurbishment of the clinic premises and some additional equipment (computer, examination bed, simple test equipment).”</i></p> <p>Are these considered incentives rather than essential equipment/ supplies? Please clarify.</p> <p><b>Page 11 of 30, paragraph 1 under section 2.3 Data:</b></p> <p>Please clarify the sampling strategy. Was this designed to achieve representativeness? Also please explain how individuals within households were selected for participation.</p> <p><b>Page 11 of 30, paragraph 2 under heading 2.3 Data:</b></p> <p><i>“another three rural doctors left their posts long-term.”</i></p>
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	<p>Were these then excluded from the analysis? Should the analysis be done on intention to treat? The approach to the inclusion / exclusion of data should be explained and justified.</p> <p><b>Page 15 of 30, paragraph 1 under section 3.4 Public health service use</b></p> <p><i>“The antenatal examination rate...”</i></p> <p>How was this defined?</p> <p>Please review all measures of impact and ensure they are clearly defined.</p> <p><b>Page 16 of 30, paragraph 1 under section 3.4 Public health service use</b></p> <p><i>“There was also no significant change in antenatal visits...”</i></p> <p>Does this refer to number of visits? Need to define measures more clearly.</p> <p><b>Page 16 of 30, paragraph 2 under section 3.4 Public health service use</b></p> <p><i>“In Chongyi, 90.1% of children were immunized...”</i></p> <p>What is the definition of “were immunized”?</p> <p><b>Page 16 of 30, paragraph 3 under section 3.4 Public health service use</b></p> <p><i>“...had attended township or village health services for assessments and increase from 65.5% (95%CI 61.5-69.5) in 2009. There were 222 respondents aged 60 years or older in Luxi. Of these 54.1% (95%CI 47.5-60.7) had attended health assessments at township or village health services an increase from...”</i></p> <p>Please clarify wording.</p> <p><b>Page 17 of 30, paragraph 2 under Discussion:</b></p> <p><i>“...those in the intervention sites were able to take these up to a greater extent because of greater support (funding for repair or refurbishment of the clinic premises and some additional equipment including computer, examination bed, and simple test equipment).”</i></p>
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	<p>Clarify this in relation to comments on incentives on page 10.</p> <p><b>Page 18 of 30, last sentence of paragraph 2 under Discussion:</b></p> <p><i>“...eligible to claim payments from these insurance funds.”</i></p> <p>Was this part of the intervention? This is not clear from the description of the intervention in the methods section.</p> <p><b>Page 18 of 30, paragraph 4 under Discussion:</b></p> <p><i>“...impact both on the receipt of public health services by rural residents and their satisfaction with care received from the doctors in these services.”</i></p> <p>There was impact in some areas but not others. Analysis of patterns of improvement may be useful for understanding what could be done to enhance impact.</p> <p>The analysis involves multiple comparisons. Some positive associations are likely to be due to chance. Should the analysis be modified to account for this? This issue should also be addressed in the discussion/ interpretation of the findings.</p> <p><b>Page 19 of 30, paragraph 1 under section Conclusion:</b></p> <p><i>“A model of CHS which is adapted to rural health services in depressed areas was associated with improvements in the acceptability of township and village health services and the level of use of public health services.”</i></p> <p>Improvement was not seen in all measures. Suggest this be modified to refer to “in some aspects of ....”</p> <p><b>Page 19 of 30, paragraph 1 under section Conclusion:</b></p> <p><i>“This can be explained by improved health workers’ capacities and service models implemented in rural community health service Chongyi.”</i></p> <p>This is one possible explanation. Are there alternative explanations?</p> <p><b>Page 20 of 30:</b></p>
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	<p>Notes:</p> <p>Need to explain and define measures that were used.</p> <p>Need to discuss validity and reliability of data.</p> <p><b>Page 24 of 30, Table 1, row Gender (male/female):</b></p> <p>Include percentages for male/ female.</p> <p>Note on table 1: Include statistical comparison at baseline for the two sites. Include percentage to facilitate comparison between sites and between periods. Comment on any differences in these in the paper and consider possible influence of the site characteristics on outcomes.</p> <p><b>Page 25 of 30, Table 2, row Chronic disease prevalence, column Luxi</b></p> <p>How to explain prevalence of 123%? How was this measured?</p> <p><b>Page 25 of 30, Table 2, row outpatient attendance rates in past 2 weeks, both figures in column Luxi:</b></p> <p>Was this a significant increase?</p> <p><b>Page 25 of 30, Table 2, rows Hospitalisation rates (at least one)# and Hospitalisation rates (total), figures in first columns of Chongyi and Luxi:</b></p> <p>There are large differences between the locations at baseline – how to explain this? This deserves some comment in relation to the comparability of the two sites.</p> <p><b>Page 28 of 30, Table 5, row Gynecology check –up, 2009 figures in columns Chongyi and Luxi:</b></p> <p>There are large differences between the locations at baseline – how to explain this? This deserves some comment in relation to the comparability of the two sites.</p> <p><b>Page 28 of 30, Table 5, row Postpartum visit, 2009 and 2010 figure in column Chongyi:</b></p> <p>Decline in post-partum visits. How to explain this in context of other</p>
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	<p>findings and overall interpretations/conclusions?</p> <p><b>Page 28 of 30, Table 5, row Postpartum visit, 2009 figure in column Luxi</b></p> <p>There are large differences between the locations at baseline – how to explain this? This deserves some comment in relation to the comparability of the two sites.</p> <p><b>Page 29 of 30, Table 6, heading Immunizations of children under 5 years</b></p> <p>How was immunisation measured?</p> <p><b>Page 29 of 30, Table 6, all rows under Vaccination site, 2009 figures of columns Chongyi and Luxi</b></p> <p>There are large differences between the locations at baseline – how to explain this? This deserves some comment in relation to the comparability of the two sites.</p> <p><b>Page 29 of 30, Table 6, * and ** note at bottom of the table</b></p> <p>What level of comparison do these statistics refer to?</p> <p><b>Page 30 of 30, Table 7, Chongi and Luxi % for 2009</b></p> <p>There are large differences between the locations at baseline – how to explain this? This deserves some comment in relation to the comparability of the two sites.</p>
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### VERSION 1 – AUTHOR RESPONSE

Reviewer Name John Furler

1.Re: the intervention, could it be made a bit clearer when it was delivered and over what time frame in relation to the surveys?

Answer:

On page 11, line 8, we added “The intervention period was from June 2009 to June 2010.”

On page11, line 30, there was a statement: “These baseline surveys were conducted at the same time in June 2009.”

On page11, line 35, there was a statement: “A similar sampling method was used in the villages after 12 months.”

2.This is a well written paper, nicely described and the authors make reasonable claims based on the findings The (just) statistically significant increase in satisfaction with patient-centred care in the



intervention sites is noted but could the authors comment on how significant this might be in practical terms.

Answer:

There was a small but significant improvement in patient satisfaction with outpatient care in Chongyi whereas that in Luxi declined. The practical significance of this is shown in Table 4. County had the strongest effect of any of the factors examined. In other research factors such as chronic disease and age have important influences on patient satisfaction [1]. We have commented on this in the Discussion.

3.The strikingly different baseline childhood immunisation rates between the intervention and control sites suggests something different about the health services for the communities at baseline. Would the authors be able to comment on this?

Answer:

We did not report changes in immunization rates. The proportion of children receiving immunization in village clinics was higher at baseline but increased further after the intervention in Chongyi. In Luxi the levels were lower and decreased further. Immunizations were undertaken by CDC to compensate for these lower levels in Luxi village clinics. We have clarified this in the Discussion,

Reviewer Name Duncan Maru

4.“Depressed” rural areas seems misleading, as if the paper was going to be discussing mental health. Choose a synonym to describe the economic condition of rural China.

Answer:

We have changed “depressed” to “economically less developed”.

Introduction: 5.Paragraph 1 is lacking citations as the claims made in sentences 2/3/4 are unsubstantiated.

Answer:

We have added two citations to the first paragraph [2, 3].

6.Paragraph 2; “but they have achieved some good results”- try to find a more academic substitute for “good”, which is vague.

Answer:

Changed “some good results” to “a significant improvement”

7.Paragraph 3, “recently, incentives...”- can you further describe what incentives you are referring to?

Answer:

The incentive policies included funding for repair or refurbishment of the clinic premises and some additional equipment (computer, examination bed, simple test equipment). By establishing these township and village health facilities as new rural cooperative medical system appointed institutions, the rural doctors were able to access subsidies for public health service work. We have added to the description of these.

Methods: 8.Can you provide any descriptive public health statistics for Chongyi County/Luxi County; eg. life expectancy, infant mortality? This would complement the descriptive economic statistics used.

Answer:

We added “In 2008, infant mortality was 9.53‰” in page 8, line 28 and “In 2008, infant mortality was 9.17‰” in page 8, line 54. We do not have life expectancy data at this level.

9.Chongyi and Luxi counties seem to be of very different population sizes (1474 households versus 587 households respectively). Although study limitations are discussed in the discussion section, it should also be noted that this difference in scale may also be a confounding factor for this study and

may weaken the statistical power of the study.

Answer:

Chongyi had a population of 203, 458 and Luxi a population of 286,300. In Chongyi we chose half of the townships to carry out intervention. From each sample village, we chose 30 households as interview households randomly. This generated a sample size of 1474. In Luxi we randomly chose three 3 townships and 9 villages as a comparison group. Random selection of households produced a sample of 587. We have clarified this in the Methods and acknowledged the difference in samples in the Discussion.

Analysis: 10. I don't see any independent t test (for continuous variable ) samples calculated??? Am I missing this?

Answer:

Table 3 shows the t-tests results with satisfaction as a continuous variable.

Results: 11. The major finding according to the authors is the patient satisfaction outcomes where the intervention group had a patient satisfaction score increase from 21.4% to 22.1% with tight 95% confidence intervals, a change of .7% while the control group saw "no change" with 20.6 to 21.4% (with broader confidence intervals). I understand that the p value is  $p < .006$  and that because of the confidence interval variation that the statistics may view this as a significant finding yet, to me, a satisfaction increase of 21.4 to 22.1% does not seem to be of meaningful difference from a clinical/policy perspective. Furthermore, it appears as though there is a discrepancy between the results section of the paper and the supplemental data table regarding the control groups' data on patient satisfaction (the results section shows a change of 20.6%  $\rightarrow$  21.4% while the supplemental data table says 20.6%  $\rightarrow$  20.2%).

$\rightarrow$  Considering that this is one of the major findings emphasized in the discussion and conclusion, I think the emphasis is overstated, unless my understanding of the data is incorrect here.

Answer:

The index of patient satisfaction evaluation was a score, not a percentage.

The score in intervention group increased from 20.6  $\rightarrow$  21.4 ( $P = 0.006$ ) and the score in control group decreased from 20.6  $\rightarrow$  20.2 ( $P = 0.342$ ), see table 3. There was an error in Table 3 in the confidence interval which has been corrected.

This means in intervention group the satisfaction score increased significantly and in control group there was no change.

Discussion:

12. Some of the findings from the data seem to be misrepresented to me. The immunization coverage in Chongyi county village clinics increased between 2009  $\rightarrow$  2010 (42.5%  $\rightarrow$  59.2%) whereas it decreased in Luxi county village clinics (16.5%  $\rightarrow$  6.0%). This seems understated in the discussion while the patient satisfaction changes seemed overstated.

Answer:

Table 6 showed the percentage of children immunization at different locations. It was not the immunization coverage rate. We have made some revisions to explain this. Please see revised table 6.

13. I would like to see more discussion about how this piece contributes to the current research literature; does it build on other studies, does it fill a research void, what research questions arise as a result of this study?

Answer:

There has been relatively little research about community health service delivery in economically less developed rural areas in China. Thus the paper fills a research void and further research is needed on models of community health service delivery which can improve rural health service quality. We have added to the Discussion.

Conclusion: 14. "Improvements in acceptability" seems like an incorrect word choice to summarize the findings considering that the overall use of services did not seem to change over the intervention period between the two counties.

Answer:

We respectfully disagree. Patient's satisfaction and public health service use by children, women and older people improved at the village level in Chongyi but not in Luxi. We have clarified the wording.

Overall:

15. Minor grammatical errors throughout the document, although these do not detract from the overall research findings.

Answer:

We have made some necessary grammatical revisions.

16. It appears that the intervention discussed in this paper is identical to the intervention from the following study: Zhaokang, Yuan, Liu Yuxi, Liu Yong, Xiao Yunchang, Guo Yuanjun, and Mark Harris. 2012. "A Model for Community Health Service Development in Depressed Rural Areas in China." BMC Health Services Research 12 (1): 465. doi:10.1186/1472-6963-12-465. This paper under review presents additional quantitative data including multivariable data analysis and more variables. However, the research question of both articles appears to be the same, namely "what is the effect of this intervention on service utilization". This raises questions regarding whether or not this is a redundant publication. Further clarification should be provided by the authors to differentiate this article from the mentioned BMC Health Services Research article.

Answer:

The article from BMC Health Services described the development of the intervention and impact of the intervention on providers. We have included reference to this in Methods. Our current article evaluated the effect of the intervention on health service users.

Reviewer Name Ross Bailie

17. This is an interesting evaluation of a health service development initiative in rural China. A number of points in the methods, results and interpretation need to be addressed before the paper could be considered suitable for publication.

Abstract

Page 3 of 30, at Data collection: "Surveys" Include reference to sample

Answer:

A reference to samples has been included. (Reference to sample size is in Page 3 of 30, line 16. The investigation object was sampled randomly).

18. Page 4 of 30, 8th and 9th line of the section Results: "whereas this decreased in comparison villages..." What are the likely explanations for the decline?

Answer:

Please see revised table 6 "The percentage of children immunization under 5 years in different site". The "proportion" was a "percentage" of children immunization in different site level. It was not immunization coverage rate. This decrease in immunisations received in the comparison villages was compensated by the increase in "Centers for disease control and prevention". We have discussed this in the Discussion.

19. Page 9 of 30, 4th line under section 2.1 Study population and sample: "In each township, 3 administrative villages were selected..." Clarify if selection was random or not.

Answer:

Villages were randomly selected from the townships which were themselves randomly selected in Chongyi and Luxi. Please see revised page 9 of 30, 4th line.

20. Page 10 of 30, at section (4) Improving access to PHC: It is not clear from the explanation that the strategies listed in this program are about improving access. Please clarify.

Answer:

We listed a series of incentive policies. These improved access to quality primary care at the village level and improved the affordability of services provided. Please see "Page 10 of 30, at section (4) Improving access to quality of PHC" from line 3 to line 8.

21. Page 10 of 30, lines 1-5 under section (4) Improving access to PHC: "carry out effective primary health care"; and "The policies included funding for repair or refurbishment of the clinic premises and some additional equipment (computer, examination bed, simple test equipment)." Are these considered incentives rather than essential equipment/ supplies? Please clarify.

Answer:

These are incentive policies. The village doctors were privately employed. They needed premises and equipment for practice. The incentives included funds to refurbish premises and purchase equipment which they would otherwise not have access to.

22. Page 11 of 30, paragraph 1 under section 2.3 Data: Please clarify the sampling strategy. Was this designed to achieve representativeness? Also please explain how individuals within households were selected for participation.

Answer:

In Chongyi half the townships were sampled to carry out intervention. In Luxi we randomly sampled 3 townships with 9 villages. From each sample village, we chose 30 households as interview households randomly. For each sampled household, we interviewed all members of the family.

23. Page 11 of 30, paragraph 2 under heading 2.3 Data: "another three rural doctors left their posts long-term." Were these then excluded from the analysis? Should the analysis be done on intention to treat? The approach to the inclusion / exclusion of data should be explained and justified.

Answer:

We did not have follow up survey data on the villages where the three rural doctors left their posts. We have acknowledged this as a limitation in the Discussion.

24. Page 15 of 30, paragraph 1 under section 3.4 Public health service use "The antenatal examination rate..." How was this defined? Please review all measures of impact and ensure they are clearly defined.

Answer:

Antenatal examination rates was defined as the number of women receiving antenatal examinations divided by the number of pregnancies. Please see table 5.

25. Page 16 of 30, paragraph 1 under section 3.4 Public health service use "There was also no significant change in antenatal visits..." Does this refer to number of visits? Need to define measures more clearly.

Answer:

It was the Antenatal examination rate. We have revised it.

26. Page 16 of 30, paragraph 2 under section 3.4 Public health service use "In Chongyi, 90.1% of children were immunized..." What is the definition of "were immunized"?

Answer:

This meant children received immunizations according to the Schedule. The text has been revised. It

did not indicate coverage.

27. Page 16 of 30, paragraph 3 under section 3.4 Public health service use "...had attended township or village health services for assessments and increase from 65.5% (95%CI 61.5-69.5) in 2009. There were 222 respondents aged 60 years or older in Luxi. Of these 54.1%(95%CI 47.5-60.7) had attended health assessments at township or village health services an increase from..." Please clarify wording.

Answer:

We have revised the wording to clarify this.

28. Page 17 of 30, paragraph 2 under Discussion: "those in the intervention sites were able to take these up to a greater extent because of greater support (funding for repair or refurbishment of the clinic premises and some additional equipment including computer, examination bed, and simple test equipment)." Clarify this in relation to comments on incentives on page 10.

Answer:

This is addressed in 21 above. Incentive policies included funding for repair or refurbishment of the clinic premises and some additional equipment including computer, examination bed, and simple test equipment) in the intervention sites.

29. Page 18 of 30, last sentence of paragraph 2 under Discussion: "...eligible to claim payments from these insurance funds." Was this part of the intervention? This is not clear from the description of the intervention in the methods section.

Answer:

Yes, by establishing these township and village health facilities as new rural cooperative medical system appointed institutions, they were eligible to claim payments from these insurance funds. This was attractive for patients who found the services more affordable. We have clarified this in the Methods.

30. Page 18 of 30, paragraph 4 under Discussion: "...impact both on the receipt of public health services by rural residents and their satisfaction with care received from the doctors in these services." There was impact in some areas but not others. Analysis of patterns of improvement may be useful for understanding what could be done to enhance impact. The analysis involves multiple comparisons. Some positive associations are likely to be due to chance. Should the analysis be modified to account for this? This issue should also be addressed in the discussion/ interpretation of the findings.

Answer:

Multiple comparisons were performed for the outcome: patient satisfaction. To address this we performed multilevel multivariable analysis examining the association between individual, household and village level variables and the two components of outpatient patient satisfaction, using MLwiN (statistical software for multilevel models. For other outcomes multiple comparisons were not performed. We analysed the two locations separately and made comparison between 2009 and 2010.

31. Page 19 of 30, paragraph 1 under section Conclusion: "A model of CHS which is adapted to rural health services in depressed areas was associated with improvements in the acceptability of township and village health services and the level of use of public health services." Improvement was not seen in all measures. Suggest this be modified to refer to "in some aspects of ...."

Answer:

Thank you – we have revised manuscript accordingly.

32. Page 19 of 30, paragraph 1 under section Conclusion: "This can be explained by improved health workers' capacities and service models implemented in rural community health service Chongyi." This

is one possible explanation. Are there alternative explanations?

Answer:

We agree that because of the quasi experimental design that differences between intervention and comparison sites may be due to other factors. We have acknowledged this but have not speculated on what they might be.

33. Page 20 of 30: Notes: Need to explain and define measures that were used. Need to discuss validity and reliability of data.

Answer:

1. For measurement indexes, we have added some explanation in manuscript.
2. Regarding validity and reliability of data, please see page 11 of 30 “2.3 data” and the discussion of limitations in the Discussion.

34. Page 24 of 30, Table 1, row Gender (male/female): Include percentages for male/ female. Note on table 1: Include statistical comparison at baseline for the two sites. Include percentage to facilitate comparison between sites and between periods. Comment on any differences in these in the paper and consider possible influence of the site characteristics on outcomes.

Answer:

1. We have revised the percentage for male/ female. Please see revised table 1.
2. We have performed statistical tests comparing the two sites. The statistically significant result is under the table 1 as note.

35. Page 25 of 30, Table 2, row Chronic disease prevalence, column Luxi How to explain prevalence of 123%? How was this measured?

Answer:

There is 123‰, not 123%.

36. Page 25 of 30, Table 2, row outpatient attendance rates in past 2 weeks, both figures in column Luxi: Was this a significant increase?

Answer:

Yes, it was a significant increase. Please see asterisk remark under the table 2.

37. Page 25 of 30, Table 2, rows Hospitalisation rates (at least one)# and Hospitalisation rates (total), figures in first columns of Chongyi and Luxi: There are large differences between the locations at baseline – how to explain this? This deserves some comment in relation to the comparability of the two sites.

Answer:

At baseline the hospitalization rate was 28.2 in Chongyi and 79.8 in Luxi. The reasons for this are unclear. The chronic disease prevalence was higher in Chongyi than Luxi which may have accounted for some of this. However the income and educational attainment was similar. Importantly in Chongyi county the hospitalization rate increased significantly after intervention whereas in Luxi county there was no significant change. This may be related to the lower initial hospitalization rate in Chongyi. We have included some comment in the Discussion.

38. Page 28 of 30, Table 5, row Gynecology check –up, 2009 figures in columns Chongyi and Luxi: There are large differences between the locations at baseline – how to explain this? This deserves some comment in relation to the comparability of the two sites.

Answer:

There are differences in two counties Gynecology check-up rates with higher rates in Chongyi than Luxi. The reasons for this are not clear but appear unrelated to hospitalization or chronic disease rates. We have included comment on this in Limitations. In Chongyi county the Gynecology check –up

rate increased significantly despite being higher at baseline whereas in Luxi county there was no significant change.

39. Page 28 of 30, Table 5, row Postpartum visit, 2009 and 2010 figure in column Chongyi: Decline in post-partum visits. How to explain this in context of other findings and overall interpretations/conclusions? Page 28 of 30, Table 5, row Postpartum visit, 2009 figure in column Luxi There are large differences between the locations at baseline – how to explain this? This deserves some comment in relation to the comparability of the two sites.

Answer:

It is unclear what the reasons for the decline in post partum-visits in Chongyi were. At baseline the rate was higher in Chongyi than Luxi. However the rate in Luxi did not change and at follow up the rates were similar in both counties. We have commented on this in the Discussion.

40. Page 29 of 30, Table 6, heading Immunizations of children under 5 years How was immunisation measured?

Answer:

Table 6 showed the percentage of children immunization who received it at different sites. It was not the immunization coverage rate. We have made some revision of table 6.

41. Page 29 of 30, Table 6, all rows under Vaccination site, 2009 figures of columns Chongyi and Luxi There are large differences between the locations at baseline – how to explain this? This deserves some comment in relation to the comparability of the two sites.

Answer:

- Table 6 showed the percentage of children immunization at different site level. It was not the immunization coverage rate.
- Although there were differences at baseline after intervention, a higher proportion children received their immunizations at village clinic. In Luxi county a much smaller proportion received their immunizations at village clinics and this fell further in 2010. This was compensated by providing immunizations from staff from the county Centers for Disease Control and Prevention(CDC).

42. Page 29 of 30, Table 6, \* and \*\* note at bottom of the table What level of comparison do these statistics refer to?

Answer:

Table 6 showed the percentage of children immunization at different site level.

“\* “ showed the significant test result between two times in Chongyi county.

“\*\* “ showed the significant test result between two times in Luxi county.

44. Page 30 of 30, Table 7, Chongyi and Luxi % for 2009 There are large differences between the locations at baseline – how to explain this? This deserves some comment in relation to the comparability of the two sites.

Answer:

There were high rates of attendance for assessments of older residents in Chongyi than Luxi and rates improved in both sites. The reasons for this are not clear although the rates of chronic disease were higher in Luxi. We have included comment in the limitations in the Discussion.

#### Additional References

1. Fan, V.S., et al., Continuity of Care and Other Determinants of Patient Satisfaction with Primary Care. *Journal of General Internal Medicine*, 2005. 20(3): p. 226-233.
2. Yip, W.C.-M., et al., Realignment of incentives for health-care providers in China. *The Lancet*. 375(9720): p. 1120-1130.

3. Anand, S., et al., China's human resources for health: quantity, quality, and distribution. The Lancet. 372(9651): p. 1774-1781.

#### VERSION 2 – REVIEW

<b>REVIEWER</b>	Ross Bailie Menzies School of Health Research Australia
<b>REVIEW RETURNED</b>	22-Jan-2014

<b>GENERAL COMMENTS</b>	<p>The sampling approach is described as 'In each village we randomly sampled the first household then selected the next 59 households in number order'. Please clarify what is meant by 'in number order'.</p> <p>Note typo for 'baseline' in last paragraph of the discussion.</p> <p>The authors can be trusted to make the required revisions, without further requirement for external review.</p>
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#### VERSION 2 – AUTHOR RESPONSE

We have made the two corrections requested by the Reviewer.

We have included two versions of the paper with track changes and with changes accepted