Author’s response to reviews

Title: Job satisfaction of the primary healthcare providers with expanded roles in the context of health service integration in rural China: a cross-sectional mixed methods study

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Author’s response to reviews:

Dear editor,

Thank you very much for organizing the comments on our manuscript. We have revised the manuscript according the comments from the reviewers. Please find the responses to the comments below.

Reviewer #1

I have at least two major issues with this paper:

1. First, although most of the sentences are roughly understandable, there is still a need for serious editing by a native English-speaker. For instance, the term "works" is usually ambiguous. There are also many typos (e.g. the funniest one being the "medicine zero-make up policy").

Authors’ response: Thanks for your kind reminder. We have done proofreading and corrected grammatical errors throughout the manuscript. For instance, we have changed the “works” to “work”, the “medicine zero-make up policy” to “zero-profit medicine policy”. We would like to mention that the zero-profit medicine policy is a national essential medicine policy in China which has been initiated since 2009, with aims to control the revenue pursuing behaviors of primary healthcare providers, including induced service provision and over-prescribing drugs, through eliminating mark-ups on drugs dispensed by primary healthcare facilities 1. There have been a number of studies focusing on the implementation of the zero-profit medicine policy 2, 3.


2. Secondly, I have deep concerns about the sampling process. It is very briefly explained (in 4 lines: 113-117). It does not seem to have been done randomly, but rather through "purposive sampling", which - if confirmed - would invalidate all the statistical analyses.

Authors’ response: Thanks for your suggestions. The study was conducted at all the THCs in three representative counties of Shandong Province. We selected Shandong Province because it is one of the first provinces having implemented policies for adding public health services into the primary healthcare institutions and had the highest number of both registered physicians and PHWs in China. In the province, the random cluster sampling method was applied. We divided all the counties into three groups according to the gross domestic product per capita, and randomly selected one county in each group to represent high-, middle- and low-level economic region respectively. Within each county, all the THCs were mandatorily surveyed and all the PCPs on duty were encouraged to participate in the survey. So the selected counties are generally representative of the health and economic development in northeast rural China.

In addition, we used a mixed-method exploratory design in which the quantitative and qualitative data were collected concurrently and showed the equal importance, to provide insights on dual work and job satisfaction during the implementation of integrated care of clinical and public health at PHC level from the administrative and provider perspective. The application of mixed methods in a specific case enhanced the contextualization as well as generalizability of the study findings.
We hope this clarification would help the reviewer interpret the sampling process. To enhance clarity for the readers, we revised and added the subsection of Study location and context section in Methods section:

“The study was conducted at all the THCs in three representative counties of Shandong Province. We selected Shandong Province because it is one of the first provinces having implemented EBPH policy and had the highest number of both registered physicians and PHWs in China 34. Shandong Province located in northeast China, had a population of 99.47 million ranking second in terms of population size, with the gross domestic product per capita at ¥68,049 ($10,078) being the third among the total 31 provinces/municipalities in mainland China.

The random cluster sampling method was applied in the province. Firstly, selection of three counties including Shouguang, Huantai and Yanggu was carried out to include an equal representation of high-, middle- and low-level economic region. Within each county, all the THCs were surveyed, including 16 from Shouguang, 13 from Huantai, and 18 from Yanggu. All the PCPs on duty on the investigation day were encouraged to participate in the structured questionnaire survey. Finally, 1146 participants were included in the quantitative analyses.”

To acknowledge that, we also mentioned one limitation in the section of Limitations:

“Third, with only one province selected in the sampling frame, the national representativeness of the study sample cannot be ascertained. However, in the province, which is one of the first provinces having implemented policies for adding public health services package into the primary healthcare institutions with the highest number of both registered physicians and PHWs in China, we believe that the selected counties are generally representative of the health and economic development in northeast rural China.”

I have also some concerns about the design of this study:

3. The concept of work autonomy" is understood in a quite simplistic manner (i.e. are you satisfied with work autonomy) and highly prone to endogeneity (i.e. job satisfaction is explained by… satisfaction about work autonomy !); it would have been better to break down this aspect in several questions and avoid the use of satisfaction terms;
Authors’ response: Thanks for your helpful suggestion. We shared the same view with the reviewer that the satisfaction of work autonomy is related to the total job satisfaction. So as mentioned in the subsection of Methods of measurements in Methods section, we defined the work autonomy as the perceived autonomy to structure the working schedule, which was surveyed by asking “Do you have the prerogative pertaining to control over your work, such as the autonomy to structure your schedule?” (Yes or no). The answer with “yes” referred to high work autonomy and the answer with “no” referred to low work autonomy. The purpose for measuring work autonomy in this study was to explain how the dual work influenced PCPs’ job satisfaction, so we considered that the perceived autonomy of work scheduling is sufficient to reach the research purpose. Since there is no agreed-upon measure of work autonomy, we conservatively select that variable that best informs our research question and most appropriate for answering the particular research question. Meanwhile, the measurement of work autonomy is based on a number of studies which defined work autonomy as work scheduling autonomy 4, 5.


In spite of that, we used another measurement for work autonomy, the decision-making autonomy, which was surveyed by asking “Have your opinions and suggestions be considered and referenced regarding decisions on institutional development?” (Yes or no). We have re-estimated the series of models to examine the associations between dual work and job satisfaction. We find the results have few changes from the previous modelling. Because the reason mentioned above, we do not add the results into our revised manuscript but only showed the results below (Appendix Table 1). We would like to hear the editor and reviewers the suggestions on whether this version of results belong to the manuscript.
4. The fact that some health workers are hired on a temporary basis may be a significant factor for their job satisfaction; I am surprised this is not taken into account;

Authors’ response: We agree with the reviewer that temporary employment status may be a significant factor for their job satisfaction. We conducted the Chi-square test and fitted the multivariate logistic regression model to examine the association between employment status and PCPs’ job satisfaction. We found that most of the physicians and nurses with dual work had temporary employment status (59.24% and 76.03%), as mentioned in the section of Results. But the associations between temporary employment status and job satisfaction were not significant in the whole sample (p=0.697), as well as in the subgroup of physicians with dual work (p=0.457) and nurses with dual work (p=0.056) which were showed in Table 3.

It is worth noting that this study assumed that the health system reform for adding public health services into clinical services at PHC level could result in the dual work the PCPs have to undertake: some public health work would be allocated to physicians and nurses; the working time would be prolonged and the work tasks would be more arduous; the performance assessments on their work would be more intensive. Therefore, this study applied a mixed-methods evaluation of the addition of public health services into the PHC delivery system in China to: 1) quantitatively examine the relationship between the dual work and job satisfaction; 2) quantitatively and qualitatively explore if the dual work impact on job satisfaction by influencing the PCPs’ workload, income and work autonomy.

According to the study goals, we further found that physicians could get more income from clinical services provision, but could not get extra bonus for their input on public health work tasks. The imbalance between inputs and rewards is a major source of dissatisfaction. This situation is more serious for those PCPs temporarily employed whose monthly salaries is ¥3000 less than that those permanent employed on the same post, which was mentioned in the subsection of Perceptions on how dual work influencing job satisfaction in Results section.

5. It is very likely that several variables are colinear (for instance, hours worked per week and monthly income); the authors should address this concern.

Authors’ response: Thanks for your helpful suggestions. We shared the same view with the reviewer that some variables may be colinear (for instance the age and professional status). In order to address this concern, we have used a collinearity diagnostic method by showing the value of Variance Inflation Factor (VIF) to measure the degree of collinearity of the independent variables. The value of VIF of professional status in the regression with age as dependent variable is less than 10, which means that the collinearity between age and professional status can be acceptable.
In addition, we would like to mention that in China hours worked per week and monthly income of PCPs are not correlated virtually. The monthly income of PCPs includes the fixed part of income and the performance-based bonus. The fixed income comes from government budgets for regular operation and zero-profit medicine policy, majority of government subsidies for essential public health services package and revenues from clinical services provisions through health insurance funds or out-of-pocket payment of patients. The performance-based bonus is based on the performance for providing the public health services and clinical services. Nevertheless, the percentage of performance-based bonus on the total income was quite low. The monthly income of those who was ranked at top according to the performance assessment is only ¥200 to ¥500 higher than those who were ranked at bottom, as mentions in the subsection of Perceptions on how dual work influencing job satisfaction in Results section.

6. Finally, I remain very skeptical of the publishing value of this paper (even if the above-mentioned comments were addressed). The proposed methodology is really basic and may be flawed. The overall findings are that health workers are now less satisfied because of the added workload they face. We could have guess that without such a study.

Authors’ response: Thanks for reminding us to pay attention to the add-on value of this study. We are very eager to further highlight and reiterate the significance of this study. We have three highlights for explaining the publishing value of this study. First, In the context of China as well as other developing countries in Africa, dual or mutil work status is common phenomena and it comes from the integration of clinical services and some vertical programs on public health services like HIV control services, maternal and neonatal care at PHC level. Second, dual work of delivering integrated services by PCPs is a potential challenge to many low-resource settings because of a number of health-system barriers, including severe financial constraints, inappropriate training and supervision for PCPs, thereby influencing PCPs’ job satisfaction. Third, this study was the first to illuminate how the dual work influenced PCPs’ job satisfaction during the process of adding public health services package into primary healthcare institutions.

We hope that reviewer and us have reached the agreement on the interpretation of publishing value of this paper after reading the revised manuscript with modifications as following.
In our revised submission, we modified and added more specific highlights of research significance in the section of Introduction:

“Dual work refers to simultaneous engagement in delivery of public health services (individual preventive services and population health interventions) and clinical services (diagnosis and treatment) by physicians and nurses in state-owned primary health care (PHC) institutions which include township healthcare centers (THCs) and village clinics in rural China. In the context of China as well as other developing countries, dual or multi work often happens because of implementing of some specific health programs like HIV control services, maternal and neonatal care to PHC level where the PHC institutions need to integrate the delivery of these services into their route services delivery. The integration of these public health services into basic clinic services at PHC level has been widely recognized as an evidence-based method to improve service accessibility, financial and operational efficiencies that promote sustainability, and improve the quality of health care via service continuity and a more person-centred approach 1. However, emerging studies have indicated that efforts to integrate specific public health services in PHC delivery systems in low-resource settings have been hampered by a number of challenges, including severe financial constraints, inadequate training and supervision for primary healthcare providers (PCPs), and inadequate policy and organizational management 2.”

“Dual work of delivering public health services and clinic services by PCPs is the consequences of a series of health policies in China. Before China health system reform in 2009, PCPs in THCs focused mainly on providing clinical services because they have to make profits from services and medicine charging under the circumstance of inadequate government funding for THCs and limited supports on public health services provision 3, which led to supplier-induced clinical services, surging health expenditures 4, and declining health care accessibility 5.”

“It is similar as some vertical health programs in other LIMCs to implement specific kinds of services by earmarked funds directly linking to the performance of providers on these services. With the administration pressure to finish the performance targets of the defined public health services and getting the subsidies, THCs have to follow the requirements of government on the defined contents of public health services, procedures of service provision, and accept regular supervisions from higher levels of supervisors.”

“Under the above health system circumstances, workload of physicians and nurses at THCs increased because of providing clinical services and newly added public health services, which undoubtedly have impacts on job satisfaction of health workers in THCs.”
To enhance clarity for the objective of this study, we revised and added in the section of Introduction:

“We assumed that the enforcement of delivering public health services package at PHC level could result in that some tasks on provision of public health services have to be allocated to physicians and nurses, the performance assessments on PCPs would be more intensive. Consequently, PCPs at THCs would face the dual work responsibility, the higher workload, the potential changes in income and autonomy, all of which are the important influencing factors of job satisfaction. This study therefore conducted a mixed-methods evaluation of the addition of providing public health services into the THCs in China to: 1) quantitatively examine the relationship between the dual work and job satisfaction; 2) quantitatively and qualitatively explore if the dual work impact on job satisfaction by influencing the PCPs’ workload, income and work autonomy.”

To further emphasize the key value of the research findings, we revised and added in the section of Discussion:

“This study used a mixed-method approach, with quantitative study for quantifying the relationship between dual work and job satisfaction, and qualitative study for illuminating how the dual work influenced PCPs’ job satisfaction after the national health policy exerting the tasks of delivering public health services package to route clinical services provision at THCs. To our knowledge, this study was the first to explore how the dual work on clinical and public health services delivery impacts on job satisfaction of PCPs under current China health system reform. The public health services package supported by EBPH policy and its segmented implementation from regular clinical work of PCPs are the major reasons causing the dual work burden for PCPs, which remained as a significant challenge for efforts to integrate public health services into primary care institutions.”

“There has been very little communication and cooperation between clinical departments and the public health department in China primary healthcare institutions. Without the merging of two kinds of services, the dual work becomes a simple addition to the work burden. The findings can provide implication for policymakers to consider, including strengthening the cooperation of clinical and public health departments at institutional level, re-organizing the financing and supervision arrangements of two kinds of services at system level in order to merge clinical and public health services as an integrated service package at PHC delivery system. Moreover, this study will provide empirical experience for other developing countries that are integrating vertical disease programs at primary care system, that integration policies should cover each of the critical functions of a health system, including governance, planning, financing, monitoring and service delivery.”
“This study found that the pressure of dual work did exist under the context of national level policy adding public health services package into route clinical services, and the dual work was associated with low job satisfaction of PCPs, especially among the physicians with dual work. The dual work might influence the PCPs’ job satisfaction through limiting their income which mismatched with their workload and reducing their work autonomy. The apply of mixed methods enhanced the generalizability of the study findings. The fundamental reason of this phenomenon was the fragment of incentives, external supervision and institutional administration for delivering newly added public health services package and existing clinical services at PHC level. The findings can provide implication for policymakers to consider the better ways to coordinate the clinical and public health departments at institutional level and to reform financing and supervision arrangements at system level. Moreover, this study will provide empirical experience for other developing countries which are integrating fragmented vertical programs at primary care level, that integration policies cannot neglect any function of a health system, including governance, financing, monitoring and service delivery.”

Reviewer #2

General comments:

1. The paper needs to define better dual work, not clear if refers to public and private practice or to practice at different level of care (lines 76-77); If public and private practice, it needs to provide a deeper critical review of the existing literature;

Authors’ response: Thanks for your helpful suggestions. Dual work refers to simultaneous engagement in public health practice and clinical practice by physicians and nurses in state-owned primary health care (PHC) facilities. This study provide insights on implementation of delivering separated clinical and public health services at PHC level from the administrative and provider perspective, and illuminate how the dual work influenced job satisfaction of primary healthcare providers (PCPs). This study did not involve clinical services provided by the private sector. In the revised submission, we added more specific definition of dual work and we also highlighted the research significance in the section of Introduction:

“Dual work refers to simultaneous engagement in delivery of public health services (individual preventive services and population health interventions) and clinical services (diagnosis and treatment) by physicians and nurses in state-owned primary health care (PHC) institutions which include township healthcare centers (THCs) and village clinics in rural China. In the context of China as well as other developing countries, dual or multi work often happens because of
implementing of some specific health programs like HIV control services, maternal and neonatal care to PHC level where the PHC insitutions need to integrate the delivery of these services into their route services delivery. The integration of these public health services into basic clinic services at PHC level has been widely recognized as an evidence-based method to improve service accessibility, financial and operational efficiencies that promote sustainability, and improve the quality of health care via service continuity and a more person-centred approach 1. However, emerging studies have indicated that efforts to integrate specific public health services in PHC delivery systems in low-resource settings have been hampered by a number of challenges, including severe financial constraints, inadequate training and supervision for primary healthcare providers (PCPs), and inadequate policy and organizational management 2.”

“Dual work of delivering public health services and clinic services by PCPs is the consequences of a series of health policies in China. Before China health system reform in 2009, PCPs in THCs focused mainly on providing clinical services because they have to make profits from services and medicine charging under the circumstance of inadequate government funding for THCs and limited supports on public health services provision 3, which led to supplier-induced clinical services, surging health expenditures 4, and declining health care accessibility 5.”

“It is similar as some vertical health programs in other LIMCs to implement specific kinds of services by earmarked funds directly linking to the performance of providers on these services. With the administration pressure to finish the performance targets of the defined public health services and getting the subsidies, THCs have to follow the requirements of government on the defined contents of public health services, procedures of service provision, and accept regular supervisions from higher levels of supervisors.”

“Under the above health system circumstances, workload of physicians and nurses at THCs increased because of providing clinical services and newly added public health services, which undoubtedly have impacts on job satisfaction of health workers in THCs.”

2. Should consider changing the focus of the paper to explore job satisfaction and not on dual employment;

Authors’ response: Thanks for reminding us to pay attention to the add-on value of this study. We are very eager to further highlight and reiterate the significance of this study. This study focused on how the dual work influenced the PCPs’ job satisfaction during the course of integrating public health services into primary healthcare institutions. We have three highlights for explaining why we focused on dual work as a predictor for job satisfaction of PCPs.

First, in the context of China as well as other developing countries in Africa, dual work comes from the integration of clinical services and some vertical programs on public health services like HIV services, maternal and neonatal care at PHC level.
Second, dual work of delivering integrated services by PCPs is a potential challenge to many low-resource settings because of a number of health-system barriers, including severe financial constraints, inappropriate training and supervision for PCPs, thereby influencing PCPs’ job satisfaction.

Third, this study was the first to provide insights on implementation of delivering separated clinical and public health at PHC level from the administrative and provider perspective, and illuminate how the dual work influenced PCPs’ job satisfaction during the course of implementation of public health services package in primary healthcare facilities. We hope that reviewer and us have reached the agreement on the interpretation of focusing on dual work after reading the revised manuscript with modifications as following. To enhance clarity for the objective of this study, we revised and added in the section of Introduction:

“We assumed that the enforcement of delivering public health services package at PHC level could result in that some tasks on provision of public health services have to be allocated to physicians and nurses, the performance assessments on PCPs would be more intensive. Consequently, PCPs at THCs would face the dual work responsibility, the higher workload, the potential changes in income and autonomy, all of which are the important influencing factors of job satisfaction. This study therefore conducted a mixed-methods evaluation of the addition of providing public health services into the THCs in China to: 1) quantitatively examine the relationship between the dual work and job satisfaction; 2) quantitatively and qualitatively explore if the dual work impact on job satisfaction by influencing the PCPs’ workload, income and work autonomy.”

3. Additionally, job satisfaction seems to be very high while in the introduction section the paper suggests it may be low;

Authors’ response: Thanks for your useful suggestion. We shared the same view with the reviewer that job satisfaction was not low as mentioned in the section of Discussion that the overall satisfaction level of this sample (77.4%) was considerable with the 80% satisfaction level by American primary care physicians 22, 35 and 70-80% that was reported by PCPs in Chinese sample regions 16, 17. So in our revised submission, we modified some sentences in the section of Introduction as following:

“Under the above health system circumstances, workload of physcians and nurses at THCs increased because of providing clinical services and newly added public health services, which undoubtedly have impacts on job satisfaction of health workers in THCs.”
4. Policy recommendations could be extended significantly given the amount of data presented/analyzed.

Authors’ response: Thanks for kind reminder. In our study, the application of mixed methods can deepen the explanation on the relationship between dual work and job satisfaction, and enhance the generalizability of the study findings. We have expanded the policy recommendations for each finding and try to extend some recommendation to other LIMCs with the similar challenges as China.

To enhance clarity for the readers of the policy recommendations of the research findings, we revised and added in the section of Discussion:

“This study used a mixed-method approach, with quantitative study for quantifying the relationship between dual work and job satisfaction, and qualitative study for illuminating how the dual work influenced PCPs’ job satisfaction after the national health policy exerting the tasks of delivering public health services package to route clinical services provision at THCs. To our knowledge, this study was the first to explore how the dual work on clinical and public health services delivery impacts on job satisfaction of PCPs under current China health system reform. The public health services package supported by EBPH policy and its segmented implementation from regular clinical work of PCPs are the major reasons causing the dual work burden for PCPs, which remained as a significant challenge for efforts to integrate public health services into primary care institutions.”

“There has been very little communication and cooperation between clinical departments and the public health department in China primary healthcare institutions. Without the merging of two kinds of services, the dual work becomes a simple addition to the work burden. The findings can provide implication for policymakers to consider, including strengthening the cooperation of clinical and public health departments at institutional level, re-organizing the financing and supervision arrangements of two kinds of services at system level in order to merge clinical and public health services as an integrated service package at PHC delivery system. Moreover, this study will provide empirical experience for other developing countries that are integrating vertical disease programs at primary care system, that integration policies should cover each of the critical functions of a health system, including governance, planning, financing, monitoring and service delivery.”
“This study found that the pressure of dual work did exist under the context of national level policy adding public health services package into route clinical services, and the dual work was associated with low job satisfaction of PCPs, especially among the physicians with dual work. The dual work might influence the PCPs’ job satisfaction through limiting their income which mismatched with their workload and reducing their work autonomy. The apply of mixed methods enhanced the generalizability of the study findings. The fundamental reason of this phenomenon was the fragment of incentives, external supervision and institutional administration for delivering newly added public health services package and existing clinical services at PHC level. The findings can provide implication for policymakers to consider the better ways to coordinate the clinical and public health departments at institutional level and to reform financing and supervision arrangements at system level. Moreover, this study will provide empirical experience for other developing countries which are integrating fragmented vertical programs at primary care level, that integration policies cannot neglect any function of a health system, including governance, financing, monitoring and service delivery.”

Minor comments:

5. Are the any data to illustrate some of the arguments about job satisfaction (high workload, low income, etc.) either from the literature or secondary data?

Authors’ response: We compared our findings with previous studies recognizing that high workload, low level of income, poor competency, fewer opportunities for career development, and incomplete organizational management were the factors leading to low job satisfaction 15-21. We also emphasized in the section of Discussion as following:

“Consistent with previous studies, we found that PCPs with higher income, low workload and high work autonomy were more likely to be satisfied 17,18,23,24,32. Our finding provided suggestive evidence that the three job characteristics became important predictors of PCPs’ job satisfaction under current China health system reform background.”

“The explanation of phenomenon is consistent with the previous studies that identified the unwillingness of health workers to deliver public health services due to concerns about rapidly increased workload without corresponding financial rewards 37, 38, 39.”
“Although a number of studies highlighted ongoing supervision as a predictor of good performance of a program incorporating specific public health service in PHC delivery system 37,40, this study indicates that the procedures and frequency of supervision should fully consider the feelings of PCPs on work autonomy to ensure its effectiveness.”

6. Would be good to discuss whether the sample for the study is a representative of the entire population (maybe compare some descriptive statistics for the two groups if available secondary datasets);

Authors’ response: Thanks for your helpful suggestion. The study was conducted at all the THCs in three representative counties of Shandong Province. We selected Shandong Province because it is one of the first provinces having implemented policies for integrating public health services into the primary healthcare institutions and had the highest number of both registered physicians and PHWs in China. In the province, the random cluster sampling method was applied. We divided all the counties into three groups according to the gross domestic product per capita, and randomly selected one county in each group to represent high-, middle- and low-level economic region respectively. Within each county, all the THCs were mandatorily surveyed and all the PCPs on duty were encouraged to participate in the survey. So the selected counties are generally representative of the health and economic development in northeast rural China.

In addition, we used a mixed-method exploratory design in which the quantitative and qualitative data were collected concurrently and showed the equal importance, to provide insights on dual work and job satisfaction during the implementation of integrated care of clinical and public health at PHC level from the administrative and provider perspective. The application of mixed methods in a specific case enhanced the contextualization as well as generalizability of the study findings.

We hope this clarification would help the reviewer interpret the sampling process. To enhance clarity for the readers, we revised and added the subsection of Study location and contextsection in Methods section:

“The study was conducted at all the THCs in three representative counties of Shandong Province. We selected Shandong Province because it is one of the first provinces having implemented EBPH policy and had the highest number of both registered physicians and PHWs in China 34. Shandong Province located in northeast China, had a population of 99.47 million ranking second in terms of population size, with the gross domestic product per capita at ¥68,049 ($10,078) being the third among the total 31 provinces/municipalities in mainland China.
The random cluster sampling method was applied in the province. Firstly, selection of three counties including Shouguang, Huantai and Yanggu was carried out to include an equal representation of high-, middle- and low-level economic region. Within each county, all the THCs were surveyed, including 16 from Shouguang, 13 from Huantai, and 18 from Yanggu. All the PCPs on duty on the investigation day were encouraged to participate in the structured questionnaire survey. Finally, 1146 participants were included in the quantitative analyses.”

We also compared the job satisfaction of this sample with other studies in China in the section of Discussion, mentioning that the overall satisfaction level of this sample (77.4%) was considerable with these were reported by PCPs in Chinese sample regions at 70-80% 16, 17.

To acknowledge that, we also mentioned one limitation in the section of Limitations:

“Third, with only one province selected in the sampling frame, the national representativeness of the study sample cannot be ascertained. However, in the province, which is one of the first provinces having implemented policies for adding public health services package into the primary healthcare institutions with the highest number of both registered physicians and PHWs in China, we believe that the selected counties are generally representative of the health and economic development in northeast rural China.”

7. Workload is poorly defined: should be number of patients seeing (or tasks preformed), longer working hours do not necessarily means higher productivity.

Authors’ response: Thanks for your reminder. We would like to mention that hours worked per week is good measurement of workload at PHC facilities of China. Because the number of patients seeing are not correlated with the monthly income of PCPs. The monthly income of PCPs includes the fixed part of income and the performance-based bonus. Majority of fixed income comes from government budgets for regular operation and zero-profit medicine policy, and government subsidies for essential public health services package. The performance-based bonus is based on the performance for providing the public health services and clinical services. Nevertheless, the percentage of performance-based bonus on the total income was quite low. So PCPs had little motivation for providing services during the working time, unless under administration pressure to follow the requirements of government on the defined contents of public health services, and accept regular supervisions from higher levels of supervisors. Meanwhile, the measurement of workload is consistent with a number of studies 1-3.
