

## PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

### ARTICLE DETAILS

#### Title (Provisional)

The impact of primary care and public health integration of chronic conditions in China: a protocol for a prospective multicentre cohort study

#### Authors

Qing, Hua; Huang, Yang-Zhen; Yang, En; Wei, Yi-Lin; Wang, Chun-ying; Dong, Heng; Song, Jia; Tang, Shangfeng

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### VERSION 1 - REVIEW

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Reviewer	1
Name	Ansari, Sameera
Affiliation Health	University of New South Wales, School of Population
Date	20-May-2024
COI	I have no competing interests with this manuscript.

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Dear Authors, the proposed cohort study is important research for managing multimorbidity for cardiometabolic conditions in primary care. Here are some comments and suggestions to improve the quality of the manuscript:

- This is a study protocol and needs to be written in future tense, not past tense, except where key milestones of the study have already been completed.
- Since hypertension is a systemic condition and not a disease as such, please use the term 'chronic conditions' and not 'chronic diseases' throughout the manuscript.
- Please proofread and edit the manuscript for grammatical and punctuation errors.
- Need to use formal and consistent academic, medical and epidemiological terminology throughout the manuscript.
- Is the study registered with any WHO-endorsed cohort study database?

#### INTRODUCTION

- What does medical specialist imply? Is that a respiratory physician? Please clarify.
- By village doctor, do you mean informal healthcare provider?

- Family physician or GP is only one member of the integrated care team, please use the term 'primary care team' instead of 'family physician team'.
- Provision of integrated care requires a multidisciplinary team centred around the patient. Why are there no nurses or other healthcare professionals and only doctors in the team?
- Please specify what you mean by 'medical system' for the context of this study.
- The study aims and objectives need to be clearly stated in the Introduction of the abstract as well as manuscript.

#### METHODS AND ANALYSIS

- A brief description of the intervention for multimorbidity received by the study's patients is needed.
- 'Hospital sites', not 'sample towns'
- Please give a justification as to how the study's sample size was calculated a-priori.
- It is stated that patients/public were involved in the study, is that a typo?

#### DISCUSSION

- Is this a global-first or national-first cohort study? If so, please specify.

#### STROBE CHECKLIST

- The page numbers of the manuscript corresponding to relevant items need to be mentioned.

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<b>Reviewer</b>	<b>2</b>
<b>Name</b>	<b>Tong, Yan</b>
<b>Affiliation</b>	<b>Shanxi Medical University, public health</b>
<b>Date</b>	<b>20-Jun-2024</b>
<b>COI</b>	<b>As a reviewer, I declare no competing interests.</b>

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With the intensification of global aging, the prevalence of chronic diseases is increasing. Effective public health measures are needed to control this trend, with primary healthcare playing a crucial role. This paper presents the research framework on the impact of care and public health integration of chronic diseases in China, so that this protocol can provide the latest research advancements of this research team and serve as a reference for related research. However, some details of this study still need to be clarified.

1.As a cohort study is involved, the main health measures should be provided separately for the exposed group and the unexposed group, namely the pilot areas follow-up group and the mainstream areas follow-up group. This information is not found in the manuscript. The relevant information should be provided.

2. Page 3, line 47. As far as I know, in China, family physician teams include public health experts who provide health education, disease prevention, and management services, among other public health functions. It should be mentioned that this reflects integrated primary care and public health services.

3. Page 6, line 45. The detection of serum biomarkers will be conducted by whom and how will the feedback be provided? The relevant information should be supplemented.

4. Page 6, line 56. The proportion of diabetes control and the number of stroke events require clarification regarding the observation time points: whether they are during the follow-up period or at the final follow-up visit.

5. Page 7, line 35. In the statistical analysis section, due to this study being designed as a cohort study, when employing a generalized linear mixed model, consideration should be given to the random effect of time.

6. In the Statistical methods and Quality Assurance section, it should be stated how to ensure homogeneity between the exposed and non-exposed groups, which is an essential criterion for maintaining the validity and generalizability of study conclusions.

7. There is a grammatical error on page 4, line 60. Given the current time (2024), the provided timeline is incorrect as it describes future events.

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## VERSION 1 - AUTHOR RESPONSE

Dear reviewers,

We have addressed all the comments and provide a point-by-point summary of how we have addressed each comment in the rebuttal letter below. In the letter, our responses are in blue. The **bold blue** represents changes to the text in the revised manuscript.

### Reviewer #1:

General comments

Dear Authors, the proposed cohort study is important research for managing multimorbidity for cardiometabolic conditions in primary care. Here are some comments and suggestions to improve the quality of the manuscript:

- This is a study protocol and needs to be written in future tense, not past tense, except where key milestones of the study have already been completed.

Thanks for the comment. This study is incomplete now. In the revised manuscript, we have adopted the past tense for the protocol content that has been completed, and changed the tense of all those that have not yet been completed to the future tense.

- Since hypertension is a systemic condition and not a disease as such, please use the term 'chronic conditions' and not 'chronic diseases' throughout the manuscript.

Thank you for your thoughtful comment. We agree that “chronic condition” is a more appropriate expression. We have revised the manuscript to standardize the expression “chronic condition”.

- Please proofread and edit the manuscript for grammatical and punctuation errors.

Thank you for your suggestion. We tried our best to improve the manuscript and made some changes. These changes will not influence the content and framework of the paper.

- Need to use formal and consistent academic, medical and epidemiological terminology throughout the

manuscript.

We have carefully reviewed and revised the entire manuscript to ensure that the terminology is appropriately formal and consistent, enhancing the clarity and professionalism.

- Is the study registered with any WHO-endorsed cohort study database?

We have not yet completed registration in any WHO-endorsed cohort study database. However, we have been approved by the Ethics Committee of Tongji Medical College, Huazhong University of Science and Technology. The helpful suggestion you mentioned will be our endeavor in future work. Thank you very much!

## INTRODUCTION

- What does medical specialist imply? Is that a respiratory physician? Please clarify.

I appreciate your attention to this detail. In this paper, “medical specialist” refers to healthcare professionals with specific expertise, which are not exclusively respiratory physicians. It’s essential to integrate primary and specialty care services to meet the needs of complex chronic conditions. Naturally, the primary care team was founded comprising one general practitioner, medical specialist, village doctor, and other health workers in primary health care organizations with relevant specialties. Patients will sign up with a primary care team. Moreover, depending on the chronic condition that the patient is in and the other diseases that the patient carries, the specialists in the primary care team will be different, including a respiratory physician, ophthalmologist, obstetrician and gynecologist, or traditional Chinese medicine herb doctor, and so on. We have now added that description to the current paper. Please find the added text below.

### Addition in manuscript

**“The primary care team comprised one general practitioner, preventive medicine physician, nurse, village doctor, and other health workers in primary health care organizations. In addition, medical specialists such as respiratory physicians, ophthalmologists, obstetricians and gynecologists, or traditional Chinese herb medicine doctors are also involved, thus integrating primary and specialty care services.”**

- By village doctor, do you mean informal healthcare provider?

Thank you for raising this important point. In rural China, village doctors refer to the smallest unit of formal health service delivery and play a crucial role in delivering basic healthcare services in their communities. Under the management of township health centers, their usual workplace is the village health office. Village doctors will join the primary care team and provide health care services to the residents together with health care personnel from township health centers or other hospitals at different levels.

- Family physician or GP is only one member of the integrated care team, please use the term 'primary care team' instead of 'family physician team'.

We agree with you that the family physician is part of this integrated care team, so 'primary care team' is more appropriate. We have meticulously changed every term “family physician team” in the manuscript to 'primary care team'.

- Provision of integrated care requires a multidisciplinary team centred around the patient. Why are there no nurses or other healthcare professionals and only doctors in the team?

Thank you for your comment. It is true that in this integrated care team, there will be not only GPs, specialists and preventive medicine physicians, but also nurses, pharmacists, community volunteers and other workers with multiple capacities. We have taken on board your suggestion to be more precise about the composition of the primary care team.

### Addition in manuscript

**“The primary care team comprised one general practitioner, preventive medicine physician, nurse, village doctor, and other health workers in primary health care organizations. In addition, medical specialists such as respiratory physicians, ophthalmologists, obstetricians and gynecologists, or traditional Chinese herb medicine doctors are also involved, thus integrating primary and specialty care services.”**

- Please specify what you mean by 'medical system' for the context of this study.

We have explained what "medical system" means in the revised manuscript. A patient's electronic care record will be accessible not only to the patient and the primary care team but also when the patient goes to a city, county, or township hospital.

#### Addition in manuscript

**"The care plan is developed collaboratively by primary care team and a shared electronic care record is accessible by the patient, members of their primary care team, and medical system across city, county, or township hospitals."**

- The study aims and objectives need to be clearly stated in the Introduction of the abstract as well as manuscript.

Thank you for your valuable feedback. We have revised the manuscript to explicitly outline the study's aims and objectives in the Introduction section of the abstract and the main text, ensuring they are clearly communicated.

#### Addition in abstract

**"The purpose of this study is to establish, implement, and evaluate an integrated primary care and public health model in China for patients in chronic conditions."**

#### Addition in manuscript

**"Consequently, we aim to describe the detailed methods and data sources for establishing a chronic patients-based cohort study in a central area of China in this protocol, to assess the effect of primary care and public health integration on the health of patients with chronic conditions in the pilot areas compared with mainstream areas."**

#### METHODS AND ANALYSIS

- A brief description of the intervention for multimorbidity received by the study's patients is needed.

Thank you for highlighting this aspect. A brief description of the intervention for multimorbidity received by the study's patients is indeed necessary for understanding the context and outcomes of the research. We have included a detailed intervention description in the revised manuscript provided to the patients.

#### Addition in manuscript

**"In townships piloting primary care and public health integration, a primary care team, comprising one general practitioner, preventive medicine physician, nurse, village doctor, and medical specialists, will provide every patient with 1) medical service, including helping patients with medical treatment, clinical care, transfer treatment, and return visit; 2) health education and medications counseling for their condition, hypertension, diabetes and stroke. Health education and health promotion will focus on proactive self-management<sup>16</sup>, such as healthy food and physical activity<sup>17</sup>, disease prevention and screening, and medication adherence. 3) Besides that, primary care teams foster the establishment of self-managed groups in patients, where participants are encouraged to gain and share knowledge or healthcare experience of ongoing health conditions and how to practice self-management for chronic condition healing and resilience.**

**In townships with mainstream care, usual practices will continue without any of the mentioned interventions. Usual practices will include other government-initiated chronic condition management programs, including medical treatment and lifestyle education."**

- 'Hospital sites', not 'sample towns'

Thank you for your comment regarding the terminology used in the manuscript. We acknowledge that the term "sample towns" is misleading and should be replaced with "hospital sites" to accurately reflect the study locations. We have made this correction throughout the manuscript to ensure clarity and precision in our language.

- Please give a justification as to how the study's sample size was calculated a-priori.

Thank you for your insightful suggestion. Our study relies on a National Key Research and Development Program, and the current sample size identified is a requirement of this program. Conducted in 12 sample sites, the study's sample size allows having sufficient power to detect meaningful differences, thus enhancing the reliability of our findings.

- It is stated that patients/public were involved in the study, is that a typo?

Thank you for pointing this out. The statement indicating that patients/public were involved in the study was indeed a typographical error. In fact, patients and the public did not participate directly in the study. We have corrected this mistake in the revised manuscript to accurately reflect the study's design and involvement.

## DISCUSSION

- Is this a global-first or national-first cohort study? If so, please specify.

Thank you very much for the comment. Although some cohorts have observed the important role of rural doctors (Sun, Y, Mu, J and Wang, D W, et al.,2022) or community workers (Jafar, T H, Gandhi, M and de Silva, H A, et al.,2020) in chronic disease prevention and control before this study, to the best of our knowledge, this is the first primary care and public health integration cohort in China that focuses on the integrated primary care team. We make this clear in the DISCUSSION.

### Addition in manuscript

**“To the best of our knowledge, this is the first primary care and public health integration cohort in China that focuses on integrated primary care team. Unlike previous studies that focused only on the beneficial role of specific measures or workers in chronic disease management, we explored the role of integrated care teams led by general practitioners in managing people in chronic conditions at the grassroots level through a combination of medical and preventive forms.”**

## STROBE CHECKLIST

- The page numbers of the manuscript corresponding to relevant items need to be mentioned.

We have revised the manuscript to include the page numbers corresponding to each relevant section or item as requested in STROBE CHECKLIST.

Thank you for your valuable feedback.

### Reviewer #2:

With the intensification of global aging, the prevalence of chronic diseases is increasing. Effective public health measures are needed to control this trend, with primary healthcare playing a crucial role. This paper presents the research framework on the impact of care and public health integration of chronic diseases in China, so that this protocol can provide the latest research advancements of this research team and serve as a reference for related research. However, some details of this study still need to be clarified.

1.As a cohort study is involved, the main health measures should be provided separately for the exposed group and the unexposed group, namely the pilot areas follow-up group and the mainstream areas follow-up group. This information is not found in the manuscript. The relevant information should be provided.

Thank you for your valuable feedback. We acknowledged that the manuscript did not sufficiently detail the main health measures for the exposed and unexposed groups (i.e., the pilot areas follow-up group and the mainstream areas follow-up group). We have revised the manuscript to include a comprehensive presentation of these health measures, separated by group, to provide clearer insights into the outcomes and comparisons between the groups.

### Addition in manuscript

**“In townships piloting primary care and public health integration, a primary care team, comprising one general practitioner, preventive medicine physician, nurse, village doctor, and medical specialists, will provide every patient with 1) medical service, including helping patients with medical treatment, clinical care, transfer treatment, and return visit; 2) health education and medications counseling for their condition, hypertension, diabetes and stroke. Health education and health promotion will focus on proactive self-management<sup>16</sup>, such as healthy food and physical activity<sup>17</sup>, disease prevention and screening, and medication adherence. 3) Besides that, primary care teams foster the establishment of self-managed groups in patients, where participants are encouraged to gain and share knowledge or healthcare experience of ongoing health conditions and how to practice self-management for chronic condition healing and resilience.**

**In townships with mainstream care, usual practices will continue without any of the mentioned interventions. Usual practices will include other government-initiated chronic condition management programs, including medical treatment and lifestyle education.”**

2.Page 3, line 47. As far as I know, in China, family physician teams include public health experts who provide

health education, disease prevention, and management services, among other public health functions. It should be mentioned that this reflects integrated primary care and public health services.

Thank you for your insightful comment. We agree that public health experts were indeed involved in the integrated teams that provide health education and disease prevention, services. We have revised the manuscript to describe the constituent members more accurately in such a team that integrates primary care and public health services.

Addition in manuscript

**“The primary care team comprised one general practitioner, preventive medicine physician, nurse, village doctor, and other health workers in primary health care organizations. In addition, medical specialists such as respiratory physicians, ophthalmologists, obstetricians and gynecologists, or traditional Chinese herb medicine doctors are also involved, thus integrating primary and specialty care services.”**

3. Page 6, line 45. The detection of serum biomarkers will be conducted by whom and how will the feedback be provided? The relevant information should be supplemented.

We sincerely appreciate your valuable comment. The detection of serum biomarkers will be executed by the primary care team. We will extract and analyze these data from the health information system with a guarantee of information security. Relevant amendments have been made to the related content of the paper to ensure a more accurate expression.

Addition in manuscript

**“Blood pressure and serum markers, including fasting glucose, total cholesterol, triglyceride, low-density lipoprotein cholesterol, and high-density lipoprotein cholesterol, will be executed by primary care team during every half-yearly follow-up survey and accessed in health information systems.”**

4. Page 6, line 56. The proportion of diabetes control and the number of stroke events require clarification regarding the observation time points: whether they are during the follow-up period or at the final follow-up visit.

Thank you for highlighting this issue. In the revised manuscript, we have specified that observation time points are taken at the final follow-up visit. This clarification will ensure that the results are accurately interpreted in the context of the study's timeline.

5. Page 7, line 35. In the statistical analysis section, due to this study being designed as a cohort study, when employing a generalized linear mixed model, consideration should be given to the random effect of time.

Thank you for your constructive comment. We recognize the importance of considering the random effect of time in the statistical analysis of a cohort study. In the revised manuscript, we have incorporated a random effect for time in the generalized linear mixed model to improve the robustness of our statistical findings.

6. In the Statistical methods and Quality Assurance section, it should be stated how to ensure homogeneity between the exposed and non-exposed groups, which is an essential criterion for maintaining the validity and generalizability of study conclusions.

In the revised manuscript, we have provided a detailed explanation of the methods used to ensure group homogeneity.

Addition in manuscript

**“The following strategies will be adopted to ensure homogeneity between the exposed and non-exposed groups. Firstly, the sample participants will be chosen based on similar population characteristics, socio-economic status, and accessibility of medical resources to minimize the pre-existing differences. Secondly, the baseline characteristics of the patients in the two groups, including age, gender, and severity of the chronic conditions, will be recorded and compared in detail. Moreover, in data analysis, methods such as stratified analysis or covariate adjustment will be used for processing.”**

7. There is a grammatical error on page 4, line 60. Given the current time (2024), the provided timeline is incorrect as it describes future events.

We have corrected this manuscript throughout based on the timeline to ensure that the description aligns with the current time in the revised manuscript.

We thank you again for your helpful feedback.

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## VERSION 2 - REVIEW

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<b>Reviewer</b>	<b>2</b>
<b>Name</b>	<b>Tong, Yan</b>
<b>Affiliation</b>	<b>Shanxi Medical University, public health</b>
<b>Date</b>	<b>02-Sep-2024</b>
<b>COI</b>	<b>No competing interests.</b>

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The author has satisfactorily addressed the concerns from the previous review, and I support the publication of the paper.