PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Health system readiness for non-communicable diseases at the primary care level: a systematic review
AUTHORS	Kabir, Ashraful; Karim, Md; Islam, Rakibul; Romero, Lorena; Billah, Baki

VERSION 1 – REVIEW

REVIEWER	Martins, Nuno IPCA and ID+, School of Design
REVIEW RETURNED	05-Oct-2021

GENERAL COMMENTS	This article presents a detailed review, with a high level of rigour and transparency. Although the results of the study are not completely unexpected, the study has a significant relevance for its level of depth and scientific rigour that clarifies and supports well the conclusions presented.

REVIEWER	Wen, Jin Sichuan University West China Hospital, Institute of Hospital Management
REVIEW RETURNED	05-Oct-2021

GENERAL COMMENTS	This study is useful for future research and practice on NCD management at the primary healthcare level.

REVIEWER	Hailey, David University of Wollongong
REVIEW RETURNED	10-Oct-2021

GENERAL COMMENTS	The review in this manuscript presents evidence on the readiness of primary healthcare systems for preventing and managing non-communicable diseases. Most of the evidence considered related to health systems in resource-poor settings and much detail is presented on the availability and limitations of relevant health care services. The standard of English is generally good but there are numerous minor difficulties. The manuscript should be checked carefully for grammatical errors, omissions and punctuation. Abstract Line 39 …add those for chronic respiratory illness 40 ----which are ?? Methods 139 Exclusion criteria Suggest replace ‘non-major’ with ‘other’ 151-158 Are the MESH terms needed in the text? All covered in the Appendix 187. Suggest remove ‘Finally’

	192 – 200 Suggest condensing/ shortening the detail provided on the MMAT 219-220 This information could be placed in exclusion criteria Results The start of this section is clear, with reference to Figure 1 re selection of studies. There is then a possible presentational difficulty. Table 2 is very detailed, over 4 pages. There is no reference in the text to this. Space would also be needed for Figure 2. Putting Table 2 as an appendix might be considered. Much detail is provided in the following pages but the relevance and context are not always easy to follow, with the references to several countries and sometimes limited detail. Breaking into short paragraphs might help. Some of the statements are not very clear or complete, eg 294 – 295. Sentences are sometimes lengthy eg 300-305. Sometimes findings from the same study are separated by those of a different study eg 356-362. There seems insufficient comment on the strengths and limitations of the studies. Can remove repeated references to countries where studies were performed, e.g. 403, both countries are identified again later in the paragraph. It is stated that most of the studies were of acceptable quality (412). However, a large proportion, 43%, did not meet this standard. That seems to require some comment to inform conclusions on the validity of the studies, but that is not included in the Discussion. Discussion Overall views are presented of areas covered in the reviewed studies, and the gaps in information that were available on some topics. System readiness was examined from the providers' perspectives, focused on the availability of infrastructures and resources in supply side responses. It is suggested that future research may focus on the demand side. The concluding paragraph notes that most of the selected studies were conducted in resource-poor settings, and perhaps more emphasis could be given to this earlier in the manuscript 446-450 It is not clear why including increasing prevalence and associated determinants/risk factors for other NCDs would have facilitated DM and HTN care, management and research. 460 - 61 A lack of a comprehensive prevention and management approach at the primary healthcare level may have hindered the full potential of health systems' response to NCDs, but that does not seem to clearly follow from what was found in this research.

REVIEWER	Das Gupta, Rajat BRAC University James P Grant School of Public Health
REVIEW RETURNED	10-Oct-2021

GENERAL COMMENTS	The aim of the research is important in the context of the world, but the authors did not conduct the search meticulously and missed several key articles/reports. Major Comments: 1. Why was the earliest date of search restricted to January 1990? Please mention in the manuscript. 2. The authors missed some key articles during search. For example why the authors excluded the following studies which utilized nationally representative sample of Bangladesh and Nepal:

	• https://bmjopen.bmj.com/content/8/10/e022817.abstract (This study has data on Upazilla Health Complex, which is a level of primary health care system of Bangladesh) • https://link.springer.com/article/10.1186/s12889-020-09279-z I recommend the authors to conduct the search once more. 3. DHS program conducts Service Provision Assessments (SPA). The reports contain data on the primary health care level's preparedness for NCDs. Why the authors did not include those reports? Those reports are very important in the context of LMICs as they collect nationally representative data. 4. The narrative description in the findings section is confusing. The authors should narrate the findings under each domain of health system according to the WHO region in study belongs or according to the economy of the country (OECD/LMICS/LICs).

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1
Dr. Nuno Martins, IPCA and ID+
Comments to the Author:
This article presents a detailed review, with a high level of rigour and transparency. Although the results of the study are not completely unexpected, the study has a significant relevance for its level of depth and scientific rigour that clarifies and supports well the conclusions presented.

Response: Thank you for your comments.

Reviewer: 2
Dr. Jin Wen, Sichuan University West China Hospital
Comments to the Author:
This study is useful for future research and practice on NCD management at the primary healthcare level.
Response: Thank you for your comments.

Reviewer: 3
Dr. David Hailey, University of Alberta
Comments to the Author:
The review in this manuscript presents evidence on the readiness of primary healthcare systems for preventing and managing non-communicable diseases. Most of the evidence considered related to health systems in resource-poor settings and much detail is presented on the availability and limitations of relevant health care services.
The standard of English is generally good but there are numerous minor difficulties. The manuscript should be checked carefully for grammatical errors, omissions and punctuation.
Response: We have had the manuscript checked by a professional proof-reader. The grammatic errors and typos were thoroughly addressed.

Abstract
Line 39 …add those for chronic respiratory illness
40 ----which are ??

Response: Chronic respiratory illness included asthma, and chronic obstructive pulmonary disease. We have added these texts in the revised version: Lines: 49-50, Page: 2

Methods
139 Exclusion criteria Suggest replace ‘non-major’ with ‘other’
Response: The comment has been addressed by replacing the word ‘non-major’ with ‘other’ in the revised version: Line: 156, Page: 7

151-158 Are the MESH terms needed in the text? All covered in the Appendix
Response: Thank you for this query. We have moved the MESH terms to the Appendix as you recommended. The following texts were supplemented: Lines: 162-177, Pages: 7-8.

‘The search strategy aimed to find English language studies in five databases (Ovid Medline, Ovid Embase, Ovid PsycInfo, CINAHL and Scopus). Electronic database searches of Ovid MEDLINE, EMBASE, CINAHL, PsycINFO and Scopus were conducted, focusing on research published between from January 1990 and to July 2021 (Figure 1). The WHO’s health system model proposed in 1984 was considered appropriate to identify and assess the key components of the primary healthcare system. The studies published in 1985 onward were deemed to be relevant to this review. Therefore, the earliest date of the search was set to ensure the optimum number of studies published since 1990. The search strategies used a combination of Subject Headings and free text terms that aimed to cover the areas of (1) non-communicable diseases (e.g., chronic disease or chronic conditions or chronic disorders), AND (2) primary health system (e.g. primary health service or first-level healthcare facility or local health system or local-level health facility) AND (3) readiness or preparedness or capacity.
Searches were adapted as appropriate to the specifications of each of the five databases. The final searches are presented in the (Supplementary Appendix file). Hand-searching and reference checking of citations and reference lists were undertaken, and additional records were identified through personal consultations with experts, including researchers, administrators, policy planners, and public health practitioners.’

187. Suggest remove ‘Finally’
Response: The suggested word ‘finally’ has been removed in the revised version: Lines: 201, Page: 9

192 – 200 Suggest condensing/ shortening the detail provided on the MMAT
Response: We have shortened the detail of MMAT in the revised version. The comment has been addressed, and this section has been supplemented with the following text: Lines: 224-230, Pages: 9-10
‘The Mixed Methods Appraisal Tool (MMAT) was used to assess the methodological quality of the included studies 23. The distribution of MMAT scores varied with the study design and the evaluation of some selected parameters. The score is 25% when quantitative study (QUAN) = 1, qualitative study (QUAL) = 1, mixed-method study (MM) = 0. It is 50% when QUAN = 2, QUAL = 2, MM = 1, 75% when QUAN = 3, QUAL = 3, MM = 2; and it is 100% when QUAN = 4, QUAL = 4, MM = 3. Thus, each study was given a score ranging from 25% to 100% (Table 1). Two authors (AK, NK) independently assessed the studies’ quality, and the senior author (BB) cross-checked them. Discrepancies and disagreements were resolved through discussions.’

219-220 This information could be placed in exclusion criteria
Response: Thank you for this suggestion. This information was provided under a separate heading of ‘Patient and public involvement: Lines: 257-258, Page: 11’, as the requirement of journal format. We think replacing this information in the exclusion criteria may not be aligned with the journal guideline.

Results
The start of this section is clear, with reference to Figure 1 re selection of studies.

There is then a possible presentational difficulty. Table 2 is very detailed, over 4 pages. There is no reference in the text to this. Space would also be needed for Figure 2. Putting Table 2 as an appendix might be considered.
Much detail is provided in the following pages but the relevance and context are not always easy to follow, with the references to several countries and sometimes limited detail. Breaking into short paragraphs might help.

Response: Thank you for this comment. We have provided summarised information in table 2. Although the table seems lengthy, we believe table convey the critical information about the included studies and benefit the readers for getting an overview. Putting the table in the appendix may not be easier for the readers to follow the key characteristics and findings of the review. Considering the readily available information within the text, we preferred to keep the table in the main body of the paper. We have provided the references in the table according to the journal's reference style.

Some of the statements are not very clear or complete, eg 294 – 295. Sentences are sometimes lengthy eg 300-305.
Response: These studies were conducted in different provinces/states in India using different methods. One study used a cross-sectional method, and another used an interview method (in-depth interview, focus group discussion). In the revised version, we have specifically mentioned the methods used in the respective studies to clarify the statements. The revised texts were added: Lines: 331-333, Page: 19

'In a cross-sectional study conducted in Madhya Pradesh, India, the preparedness level for DM and HTN was reported to be slightly high 35. However, inadequate capacity was found for managing the common NCDs in a qualitative study in Odisha and Kerala, India 41'

Sometimes findings from the same study are separated by those of a different study eg 356-362. There seems insufficient comment on the strengths and limitations of the studies.
Response: Thank you for this comment. We presented the findings reported in the original studies in the result section. The comments regarding the strengths and limitations were provided in subsequent sections, including the discussions sections. We have clarified this information by rephrasing the texts: Lines: 394-397, Page: 21

'In India, the essential drugs for the management of HTN (beta-blockers and calcium channel blockers) were available at most of the primary health centres (PHCs) and community health centres; however, other drugs (except metformin) were largely unavailable across facilities that resulted in 90% of NCD patients in India to rely on private providers/facilities for NCD service and care 35.'

Can remove repeated references to countries where studies were performed, e.g. 403, both countries are identified again later in the paragraph.
Response: We have removed the references as you recommended in the revised version: Line: 441, Page: 23

It is stated that most of the studies were of acceptable quality (412). However, a large proportion, 43%, did not meet this standard. That seems to require some comment to inform conclusions on the validity of the studies, but that is not included in the Discussion.
Response: The comment has been addressed, and this section has been supplemented with the following text: Lines: 496-502, Pages: 25-26

'Most of the studies included in this review had a reasonably acceptable quality. However, a large proportion of the study reflected inexplicit evidence due to the methodology, small sample size, bias, and incomplete information. The majority of the included studies used the WHO's health system

framework as an analytical basis to identify the health system components. However, many studies lack a deeper analysis of the interplay and interconnectedness between different health system components. Despite these limitations, this study provides important information regarding current evidence on the readiness of the primary healthcare system for NCDs.'

Discussion
Overall views are presented of areas covered in the reviewed studies, and the gaps in information that were available on some topics. System readiness was examined from the providers' perspectives, focused on the availability of infrastructures and resources in supply side responses. It is suggested that future research may focus on the demand side. The concluding paragraph notes that most of the selected studies were conducted in resource-poor settings, and perhaps more emphasis could be given to this earlier in the manuscript

446-450 It is not clear why including increasing prevalence and associated determinants/risk factors for other NCDs would have facilitated DM and HTN care, management and research.

Response: The increasing prevalence of DM and HTN would have created growing demands for services and community expectations. Moreover, DM and HTN are more manageable than other NCDs with low-cost treatment, health promotion initiatives, and self-management care. Many health systems addressed the growing demands through optimising resources and health promotion initiatives that would have enhanced a higher level of readiness for DM and HTN care and services in the primary level facilities.

460 - 61 A lack of a comprehensive prevention and management approach at the primary healthcare level may have hindered the full potential of health systems' response to NCDs, but that does not seem to clearly follow from what was found in this research.

Response: Thank you for this comment. The summarised data (Table 2) indicated that the majority of studies reported the management and treatment aspects of the NCDs. The NCDs prevention responses (e.g., screening, health promotion activity, tobacco control, nutrition/diets) were reported in a few studies. These findings led the authors to hypothesize these arguments. We have rephrased these texts to clarify this, Lines: 501-503, Page: 25

Lack of a comprehensive prevention and management approach led us to hypothesise that the full potential of the health system's response to NCDs may have been hindered at the primary healthcare level.

Reviewer: 4
Dr. Rajat Das Gupta, BRAC University James P Grant School of Public Health
Comments to the Author:
The aim of the research is important in the context of the world, but the authors did not conduct the search meticulously and missed several key articles/reports.

Major Comments:
1. Why was the earliest date of search restricted to January 1990? Please mention in the manuscript.
Response: Thank you for your query. The comment has been addressed, and this section has been supplemented with the following text: Lines: 165-168, Page: 7

'The WHO's health system model proposed in 1984 was considered appropriate to identify and assess the key components of the primary healthcare system. The studies published in 1985 onward

were deemed to be relevant to this review. Therefore, the earliest date of the search was set to ensure the optimum number of studies published since 1990.'

2. The authors missed some key articles during search. For example why the authors excluded the following studies which utilized nationally representative sample of Bangladesh and Nepal:

• https://bmjopen.bmj.com/content/8/10/e022817.abstract (This study has data on Upazilla Health Complex, which is a level of primary health care system of Bangladesh)
Response: We appreciate that you have identified an important study. Our search also yielded this study. We excluded this study because it reported a mix of primary and secondary level healthcare facilities in Bangladesh. We have reviewed the study and found that readiness of Upazila Health Complex (primary healthcare facility) was presented separately that met our inclusion criteria. In this revised version, we have included this study. The necessary changes have been made in the table, figure, relevant texts, and in the supplementary appendix (study no 14).

• https://link.springer.com/article/10.1186/s12889-020-09279-z
I recommend the authors to conduct the search once more.
Response: Thank you for recommending this study. This study was conducted in Nepal and included the provincial, district, and primary health centres. This study reported the health system readiness for CVD, and DM at the 100 inpatients bed hospitals and primary health centres. This study reported the readiness of the healthcare facility according to the type of facility (public, and private). Still, it did not specifically separate the level of these facilities (primary, secondary, tertiary). Thus, we don't know precisely how many primary care facilities were included within the public health facility. Therefore, this study does not fully meet the inclusion criteria. Based on the inclusion criteria, we decided not to include this study. We mentioned the reason for the exclusion that provided in the supplementary appendix (study no. 36).

3. DHS program conducts Service Provision Assessments (SPA). The reports contain data on the primary health care level's preparedness for NCDs. Why the authors did not include those reports? Those reports are very important in the context of LMICs as they collect nationally representative data.
Response: We agree that the Service Provision Assessments (SPA) data are important and presented as reported. Based on the exclusion criteria, we did not include these reports. We mentioned this in the exclusion criteria: Lines: 156, Pages: 7

4. The narrative description in the findings section is confusing. The authors should narrate the findings under each domain of health system according to the WHO region in study belongs or according to the economy of the country (OECD/LMICS/LICs).

Response: Thank you for this comment. We presented the findings under themes embedded in the health system dynamic framework. This is comprehensive framework consists of ten elements that have been embedded in the WHO health system framework and contemporary literature. We have described this in the method section. This review focused on the various components of the health system. Thus, instead of presenting findings based on the regions or economic status of the countries, we presented the findings under various health system components embedded in the health system dynamic framework.

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COI statements:

Reviewer: 1
Competing interests of Reviewer: I don't have competing interests.

Reviewer: 2
Competing interests of Reviewer: No competing interests

Reviewer: 3
Competing interests of Reviewer: None to declare

Reviewer: 4
Competing interests of Reviewer: None Declared

VERSION 2 – REVIEW

REVIEWER	Hailey, David University of Wollongong
REVIEW RETURNED	24-Nov-2021

GENERAL COMMENTS	A number of corrections have been made to the manuscript and some additional detail provided. However, further checking for errors and omissions is recommended. Responses regarding Table 2 were noted. Grouping the studies by country rather than by the names of first authors might be considered. The manuscript still states that most of the studies were of acceptable quality (p20, line 409), though 'most' was only 57%. This is followed, in the Discussion, by "Most of the studies included in this review had a reasonably acceptable quality" (p22, line 458). The details that follow are helpful but a more considered summary statement is required. The information regarding increasing prevalence of DM and HTN is worthwhile but does not address the point made which referred to "The focus on DM and HTN may be due to multiple factors, including increasing prevalence and associated determinants/risk factors for other NCDs……" (lines 441-443 in R1)

REVIEWER	Das Gupta, Rajat BRAC University James P Grant School of Public Health
REVIEW RETURNED	27-Nov-2021

GENERAL COMMENTS	Thank you for addressing the comments. I have few comments: 1. I am not convinced about the logic of restricting the earliest date of search to January 1990. The authors wrote: ". The studies published in 1985 onward were deemed to be relevant to this review. Therefore, the earliest date of the search was set to ensure the optimum number of studies published since 1990." Then the authors should set the search date starting from January 1985. That would ensure them that they are not missing any studies. 2. Also excluding SPA reports is a big fallacy of this manuscript. If this is a systematic review aiming to synthesise the current

	evidences on primary healthcare system readiness and evaluate its response to NCDs on a global scale, even by amending the study protocol. Without this the systematic review will be incomplete and the evidence will not be robust. DHS does these surveys to generate evidence and these surveys follow rigorous methods. The authors should again consider this.

VERSION 2 – AUTHOR RESPONSE

Reviewer: 3
Dr. David Hailey, University of Wollongong
Comments to the Author:
A number of corrections have been made to the manuscript and some additional detail provided. However, further checking for errors and omissions is recommended.

Response: Thank you for your recommendation. We have rechecked the manuscript and errors and omissions were thoroughly addressed.

Responses regarding Table 2 were noted. Grouping the studies by country rather than by the names of first authors might be considered.

Response: The comment has been addressed. We have added a column as country in the revised manuscript: **Table 2, Page: 12-15**

The manuscript still states that most of the studies were of acceptable quality (p20, line 409), though 'most' was only 57%. This is followed, in the Discussion, by "Most of the studies included in this review had a reasonably acceptable quality" (p22, line 458). The details that follow are helpful but a more considered summary statement is required.

Response: The first comment above has been addressed as follows (please **see lines: 432-435, page: 22**) in the revised manuscript:

Nearly three-fifth (61%) of the studies were of good or high quality (MMAT score of 75) (Table 1): one paper (4%) had an MMAT score of 25 (low quality), eight (35%) scored 50 (medium quality), eleven (48%) received 75 (good quality) and three (13%) reached 100 (high quality). No study had an MMAT score of 0 (poor quality).

The second comment above has been addressed as follows (**lines: 485-493, Page:** 24) in the revised manuscript):

The sentence 'Most of the studies included in this review had a reasonably acceptable quality" has been replaced with (**please see line: 485-486, page: 24**) 'Majority of the studies in this review had good or high quality'.

Furthermore, the following texts have been added (**please see lines: 488-493, page: 24**)

'A few quantitative studies lacked sufficient details about the participants' selection criteria, standard criteria for minimizing bias, and use of non-validated questionnaires with a relatively small sample size that might affect the scope of generalizability of the findings (27, 29, 32, 34, 35). One mixed-method study was rated low quality due to the homogeneous sample and insufficient information about the data analysis (47). The rest of the mixed-method studies included in the review had a more representative sample size and methodological rigors.'

The information regarding increasing prevalence of DM and HTN is worthwhile but does not address

the point made which referred to “The focus on DM and HTN may be due to multiple factors, including increasing prevalence and associated determinants/risk factors for other NCDs……” (lines 441-443 in R1)

Response: We have provided additional text to explain the possible reason for higher level readiness/availability of services for DM and HTN compare to the other NCDs (cancer, CRD, CVD) in the discussion section: **Lines: 468-477, Page: 23**

‘Moreover, the integrated model for DM and HTN care has widely been considered in the low-and middle-income countries that accelerated the provision of effective and equitable health service delivery at the primary healthcare level, which would have helped to address the rising burden of them with accessible, equitable, and cost-effective interventions (56-58)’

Reviewer: 4
Dr. Rajat Das Gupta, BRAC University James P Grant School of Public Health
Comments to the Author:

Thank you for addressing the comments. I have few comments:
1. I am not convinced about the logic of restricting the earliest date of search to January 1990. The authors wrote: “. The studies published in 1985 onward were deemed to be relevant to this review. Therefore, the earliest date of the search was set to ensure the optimum number of studies published since 1990.” Then the authors should set the search date starting from January 1985. That would ensure them that they are not missing any studies.

Response: Thank you for raising this concern regarding the starting date of search. The search has been updated from January 1984 to December 1990, which resulted in 17 additional studies and of them no study satisfied the inclusion criteria. The revised manuscript has been updated with this search results.

2. Also excluding SPA reports is a big fallacy of this manuscript. If this is a systematic review aiming to synthesise the current evidences on primary healthcare system readiness and evaluate its response to NCDs on a global scale, even by amending the study protocol. Without this the systematic review will be incomplete and the evidence will not be robust. DHS does these surveys to generate evidence and these surveys follow rigorous methods. The authors should again consider this.

Response: We acknowledge that SPA report presents important information regarding the preparedness of the primary healthcare system regarding the NCDs. We have considered this report as relevant. However, we understand that SPA reports health system preparedness at the primary as well as secondary healthcare levels on the various health system components. Thus, it was not always possible to retrieve solely the primary healthcare-specific data from these reports. The following texts were included in the revised manuscript.

Lines: 324-330

‘The shortage of trained healthcare staff (at least one staff received in-service training in the last 24 months before the data collection date) was reported at the primary healthcare in Bangladesh (39). The trained staff for cervical cancer (29% trained staff at the UHCs, but no trained staff in CCs and union-level facilities), CRD (4% union-level facilities, 11% CCs, and 29% UHCs), CVD (7% union-level facilities, 15% CCs, and 40%, UHCs), DM (3% union-level facilities, 14% CCs, and 28% UHCs), and hypertension (6% union-level facilities, 10% CCs, and 39% UHCs) were reported (39).’

Lines: 368-371, Pages: 18-19

‘In Bangladesh, the availability of medicine widely varied at the UHCs based on their types for DM (metformin 38.1%, glibenclamide 7.4%), CRD (salbutamol 91.6%, epinephrine 0.3%), CVD (amiodipine/nifedipine 41.5%, aspirin 2.6%), and HTN (amlodipine/nifedipine 44.7%, thiazide 1.4%), but no supply in the CCs were reported (39).

Lines: 388-392, Page: 20

‘However, basic equipment and diagnostic facilities such as stethoscope (93.2% CCs, 96.9% UHCs), blood pressure apparatus (85.6% CCs, 95.4% UHC), adult scale (90.9% CC, 82.9% UHCs), blood glucose testing (22.2% CCs, 48.9% UHCs), urine protein (0% CCs, 36.2 % UHCs), and urine glucose (0% CCs, 30.4 % UHCs) were available in Bangladesh (39).

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COI statements:

Reviewer: 3
Competing interests of Reviewer: None to declare

Reviewer: 4
Competing interests of Reviewer: None declared

VERSION 3 – REVIEW

REVIEWER	Das Gupta, Rajat BRAC University James P Grant School of Public Health
REVIEW RETURNED	23-Jan-2022

GENERAL COMMENTS	The authors have addressed the comments.

VERSION 3 – AUTHOR RESPONSE

Response: Thank you for giving the opportunity to respond. We have the change the title of the article as follows.

"Health system readiness for non-communicable diseases at the primary care level: a systematic review"