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Stakeholder Engagement in Planning the Design of a National Needs Assessment for Cardiovascular Disease Prevention and Management in Nepal

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Abstract

Objective: While there is growing support for stakeholder engagement in health research, the actual impact of such engagement has not been well established. This paper describes the stakeholder engagement process and evaluation while planning the national needs assessment for cardiovascular disease in Nepal.

Methods: We used personal and professional networks to identify relevant stakeholders within the 7P framework (Patients and the Public, Providers, Purchasers, Payers, Public Policy Makers and Policy Advocates, Product Makers and the Principal Investigators) to develop plan for assessing cardiovascular health needs in Nepal. Forty stakeholders were consulted through two meetings in small groups and a workshop in a large group to develop the study methods, conceptual framework and stakeholder engagement process. We interviewed 33 stakeholders to receive feedback on the stakeholder engagement process.

Results: We engaged 80% of the targeted stakeholders through small group discussions and a workshop. Three out of five recommendations from the small group discussion were aimed at improving the stakeholder engagement process and two were aimed to improve the research methods. Eleven out of 27 recommendations from the workshop aimed to improve the research methods, 4 aimed to improve stakeholder engagement and 2 helped to expand the scope of dissemination. Ten were irrelevant or could not be incorporated due to resource limitation. Most stakeholders noted that the workshop provided an open platform for a multi-sectoral group to co-learn from one another and share ideas. Others highlighted that the discussion generated insights to enhance research by incorporating expertise and ideas from different perspectives. The major challenge discussed were around committing the time for engagement.

Conclusion: The stakeholder engagement process positively impacted the design of our research. This study provides important insights for future researchers that aim to engage stakeholders in national level assessment programs in the healthcare system in the context of Nepal.

INTRODUCTION

A key challenge for the healthcare systems research is to close the gap between.¹ Stakeholder engagement is an important pathway to narrow this gap.² Stakeholder helps to generate knowledge, increase ownership, reduce conflict and encourage partnership. Stakeholder engagement also facilitates inclusive decision making and promotes equity on decision making.³ Stakeholders can be engaged across the stages of research including identifying topics, choosing hypotheses, analyzing data, and disseminating findings.^{4,5} The levels of involvement range from consultations, to collaboration in bi-directional partnerships, to collaboratively leading research projects.⁶

While there is growing support for stakeholder engagement, the actual impact of such engagement has not been well established. Systematic reviews have reported that only a few studies actually measure engagement, and there is lack of consensus on reporting stakeholder engagement process and outcomes.^{7,8} Although there has been a rapid increase of work on stakeholder engagement as well as recommendations that researchers systematically document and evaluate stakeholder engagement process and report its impact on individual projects³, there is limited reporting of the process and even less of evaluation of the engagement process. Here, we describe the stakeholder engagement and evaluation while planning the national needs assessment for CVD prevention and management in Nepal.

METHODS

Setting

Project: Translational Research Capacity Building Initiative to address Cardiovascular Diseases in Nepal: The project aims to build national capacity to lead translational research in cardiovascular diseases (CVDs) by creating and training a multi-sectoral, multi-disciplinary team; building partnership with US and regional institutions; systematically assessing national needs; and developing an actionable translational research plan. CVDs are the leading causes of premature deaths in the world with more than 80% of all CVD-related deaths occurring in low-and-middle-income countries (LMICs).⁹ In Nepal, CVD risk factors have increased alarmingly over the past decades, increasing by 45% and 41% in deaths due to ischemic heart disease and stroke, respectively, between 2007-2017.^{9,10} Proven cost-effective strategies are available for reducing cardiovascular diseases in low-income settings including both population-wide and individual risk approaches. However, scaling up these interventions is challenging especially in a low-income country like Nepal. Not only is individual behavior modification complicated by socio-cultural and environmental factors, in addition the healthcare delivery system is not set up to address prevention and treatment, nor adequate resources have been dedicated towards these efforts to address prevention and treatment. Specifically, enormous gaps exist in: a) epidemiological understanding of CVDs and their risk factors (modifiable and non-modifiable); b) national level policies and strategies to address CVDs; c) health care systems infrastructure to provide education and treatment; d) community and patient-level support at the local level; e) development and application of national registries for CVDs and f) human resources to lead and implement the agendas to address the growing burden of CVD in Nepal.

A multi-faceted, multi-sectoral synergistic effort is required for the sustainable uptake of evidence-based interventions into routine clinical and community-based settings. Given the complexities, it is important to train and build the capacity of the Nepali researchers to identify local needs for CVDs and develop feasible context-specific implementation strategies to deliver evidence-based interventions. To lay this groundwork, Dhulikhel Hospital - Kathmandu University Hospital has built a collaborative team of Nepalese and international experts to build capacity, assess national needs and develop an actionable

translational research plan to address the growing burden of CVDs in Nepal. We have also enrolled 16 researchers as research fellows from diverse professional background.

The overall aim of the national needs assessment is to investigate the CVDs epidemiology and national capacity to prevent and manage CVD in Nepal. The specific aims are: (1) to assess national level infrastructure and capacity for CVD prevention and management interventions in Nepal on (a) leadership and governance, (b) health service delivery, (c) health financing, (d) human resources, (e) pharmaceuticals and medical products and (f) health information system; and (2) to assess the cardiovascular disease burden and severity in Nepal using available secondary data. The main outcome of the assessment is to report key findings for each health system function, highlighting important strengths, critical cross-cutting health system weakness that limit performance, and recommendations for priority interventions. In addition, the findings, priorities and recommendations have to be corroborated and validated by key stakeholders at the national level. The results of the assessment will be utilized to prioritize national CVD health needs, design relevant interventions, and develop a translational research plan

Conceptual Framework—We used Ray and Miller’s framework³ for planning, evaluating and reporting stakeholder engagement. The framework is illustrated in Table 1. As our study is in an early phase, we are only able to report immediate outcomes in this paper.

Context: In the context of an overall research agenda of assessing national needs for the prevention and management of CVDs, we planned to engage a wide range of stakeholders from different sectors. There was a high level of commitment from researchers to engage relevant stakeholders in the process. The desired inputs were the values, knowledge and experience of a range of stakeholders. The desired outputs were to incorporate the inputs to improve research objectives, scope, and methods, and to guide subsequent research efforts. External funding and dedicated time were available for the stakeholder engagement and evaluation.

The purpose of the stakeholder engagement was to incorporate a broad range of experiences in the planning and execution of the needs assessment to enhance interpretability and relevance of findings suited for local context. The stakeholders were consulted specifically for developing the study methods, conceptual framework and stakeholder engagement process. In the long run, stakeholders are planned to be engaged at different levels: (a) Inform: to provide stakeholders with balanced and objective information to help them understand the needs assessment process, results and recommendations; (2) Consult: To obtain inputs from stakeholders on the process, results and recommendations; (3) Involve: To work with stakeholders throughout the process to ensure their feedback is incorporated; (4) Collaborate: To partner with stakeholders for conducting the needs assessment : defining objectives, data collection, data analysis and interpretation; and (5) Empower: to engage in the needs assessment process with shared power in decision making process for conducting the assessment.

Processes

Stakeholder Recruitment and composition: We defined a stakeholder as an individual or group affected by CVD, or in a position to directly influence CVD prevention and management at a national level in Nepal. We adopted the 7Ps framework¹¹ that identifies key groups to consider for engagement. The first group, patients and the public, represents the current and potential consumers of patient-centered health care and population-focused public health services. The second were providers, including individuals and organizations that provide care to patients and populations. Purchasers, the individuals and entities responsible for underwriting the costs of health care, such as employers, made up the third group. The fourth group consisted of payers who were responsible for reimbursement of medical care, such as insurers. The fifth is composed of public policy makers and policy advocates working in the non-governmental sector. Product makers, representing drug and device manufacturers, comprised the sixth group, and principal investigators, or other researchers, made up the seventh. We used personal and professional networks to identify relevant stakeholders within the 7P framework. Further, we updated the list after receiving feedback in our first stakeholders' meeting. We received ethical approval to include human subjects (stakeholders) from the Institutional Review Committee of Kathmandu University School of Medical Sciences, an independent body approved by Nepal Health Research Council.

Frequency and duration of engagement: For planning of the needs assessment, we interacted with the stakeholders on three separate occasions: during two meetings with a smaller group of 15 people; and one workshop with a group of 37 stakeholders.

Small group meetings: We formed a task force to guide and lead the needs assessment process, co-chaired by the principal investigator of the translational research to address and cardiovascular disease in Nepal; and the Executive Chairperson of the Nepal Health Research Council (NHRC), an apex body for health research in Nepal. There are co-investigators, a heart patient, a representative from Cardiac Society of Nepal, representatives from the Ministry of Health and Population and members from NHRC in the task force. The task force aims to meet four times a year to plan and oversee the needs assessment process. We conducted two one-hour task force meetings to discuss the needs assessment proposal and received feedback.

Stakeholder workshop: We conducted a three-hour workshop with 40 stakeholders to present the needs assessment plan and receive feedback. The stakeholders introduced themselves to the large group. Then, we provided a brief orientation to the preliminary research topic, conceptual framework and methods using PowerPoint presentation to promote full participation. We stimulated co-learning by ensuring that each stakeholder had at least a five-minute dedicated time to speak and encouraged them to ask questions and share their experiences and expertise. We addressed concerns or queries raised by the stakeholders. Two research team members were dedicated to recording all comments and recommendations in a log.

Setting expectations and decision making: At our first stakeholder workshop, we revisited expectations and invited further dialogue in roles and responsibilities. For the task force, we also prepared a terms of reference (TOR) document specifying the roles of stakeholders, power dynamics and decision-making process.

Immediate outcomes: The principal investigator and co-investigators further discussed the feedback and revised research questions, scope, and methods.

Evaluation of Stakeholder engagement: We approached 37 stakeholders for an interview to receive feedback on the stakeholder engagement process. This explored perspectives of the stakeholders regarding the engagement process and how it could be improved in future. We asked their feedback in relation to the following themes: (a) expectations from the engagement process (b) representation of stakeholders; (3) degree of involvement; (4) engagement channels and methods; (5) future expectations; and (6) benefits and barriers to engagement. The interviews were semi-structured and were administered in-person or through telephone by a co-investigator and a research officer. The responses were coded manually and analyzed thematically.

RESULTS

Stakeholders and purpose of engagement:

Based on the 7P framework, we present stakeholders and the purpose of engagement in Table 1. A total of 50 stakeholders were identified, out of which 40 accepted our invitation and were engaged. Out of the ten who were not engaged, six had other conflicting time commitments and four cited personal reasons for not attending any interaction programs. We achieved a balanced composition of our stakeholder group, with 5 representatives from patient and public; 5 representatives from providers, 3 purchasers, 4 payers, 5 policy makers, 4 product makers and 14 research team members, including investigators and research assistants. Stakeholder mapping has been illustrated in table 2.

Immediate Outcomes:

Discussion during task force meetings and impact on the needs assessment plan: The recommendations and their impacts on the need assessment plan are summarized in Tables 3. All five recommendations made during the task force meetings were incorporated into the needs assessment plan. Three of the recommendations focused on improving the stakeholder engagement process, while two recommendations were aimed at improving or modifying methods to align with stakeholder priorities.

Discussion during stakeholder workshop and impact on the needs assessment plan: During the discussion session in the workshop, we received a total of 28 recommendations. Out of these, 16 recommendations were incorporated. Eleven helped to improve research methods, 4 to improve stakeholder engagement and 2 to expand the scope of dissemination. The recommendations and impacts that were incorporated are summarized in Table 4. Seven recommendations were beyond the scope of this study and

five that were relevant but could not be incorporated due to resource limitations. The recommendations that were not incorporated with the reasons are summarized in Table 5.

Intermediate and long term outcomes: As our research and engagement process is in the early phase, we are not able to assess and report intermediate and long term outcomes.

Evaluation of Stakeholder Engagement: Eighty nine percent of the stakeholders who attended the workshop responded to our interview calls (n=33).

Expectations from the engagement process: Only about a half of the participants mentioned that they were aware of the purpose of the meeting and their specific roles prior to attending the event. Several participants underscored the need of pre-meeting information sharing and preparation before the workshop.

One participant said, *'I came because my friend couldn't come and she asked me to participate on her behalf. I didn't have any idea of what the program was about.'*

'Role and expectation from all the stakeholders must be clarified earlier. Since there are different levels of stakeholders, clarity is required beforehand' (A participant from principal investigator group of 7Pframework)

Representation of stakeholders: Almost all (32/33) of the participants said that relevant people were invited. Some suggested to include following stakeholders in subsequent meetings: such as (1) caretakers of heart patients, (2) representatives of Female Community Health Volunteers from other areas (*in the first meeting, FCHVs from only one district were invited*), (3) government representatives from local levels, (4) representatives from the Ministry of Finance, (5) consumers' groups, (6) health providers working in rural areas, (7) gender experts, (8) representatives from other ministries, and (9) health economists.

Participants from the Ministry of Health and Population suggested that more government representation was required not just in the assessment process but also as researchers or research fellows.

One government representative said, *'If we aim for changes at the national level, there has to be active participation of government representatives in the research'*

Degree of involvement: More than half of the participants (n=16) said that they actively participated in the stakeholder workshop and felt that their inputs were accepted and addressed in the discussion. Research team members who were involved in developing the preliminary needs assessment plan chose not to speak much in order to provide more time and space for other stakeholders. All participants unanimously agreed that they were included well in the discussions.

Engagement channels and methods: None of the participants said that the further engagement plan of the stakeholders (four workshops with similar intensity and activity in two years) would be too much. In fact, almost a third of them said that might not be enough time (n=11). Participants were also willing to share their views/opinions in future through

phone calls (n=17), emails/letters (n=21) and in-person meetings (n=14). More than half of the participants believed their task was to inform or consult the project team (n=15) and about a third thought that they had to be involved in the process as well (n=11).

Many participants highlighted that the interactive sessions with smaller groups can be more informative.

As one participant said, *'Rather than long discussions on different topics, it would have been better to have multiple short presentations, followed by interactions among smaller groups on different topics.'*

There was also a concern regarding the heterogeneity of the group, potentially affecting the understandability of the discussions. One participant mentioned, *'Patients and caretakers might not be able to grasp the technical details of the presentations and the discussions.'*

Benefits of stakeholder engagement:

Almost all participants said that the workshop provided an open platform for a multi-sectoral group to co-learn from each other and share ideas. It helped to enhance the research design process by incorporating expertise and ideas from different perspectives early on. Other benefits that were noted were: (a) commitments from policy level; (b) awareness of all relevant professionals on what to expect from CVD prevention and management needs assessment; (c) identification of the gaps in the assessment plan; (d) team building; and (e) enhanced ownership. Some participants stated that participation at the planning phase can lead to the improved implementation of the assessment process, validation of findings and ownership of the results.

Challenges of stakeholder engagement:

About a third of the participants (n=10) mentioned that it is challenging to commit time for conducting research. Some mentioned that engaging the same government officials throughout the research process will be difficult because of their frequent transfer. Other major challenges that were noted include: (a) difficulties around comprehending and incorporating feedback from such a diverse group of people; (b) varying levels of pre-existing knowledge and expertise which makes it challenging to discuss with all of them together in a single forum; and (c) challenges around professional or personal aspirations among stakeholders which may not be relevant to the research process. We have summarized the major challenges, barriers and the proposed ways to address them for stakeholder engagement in Table 6.

DISCUSSION

We describe the experience of stakeholder engagement in planning the national level needs assessment for CVD prevention and management in Nepal; and evaluation of the engagement process. We specifically investigated how the stakeholder engagement impacted our needs assessment plan and their feedback to improve the stakeholder engagement process in future. We were able to engage eighty percent of the targeted stakeholders identified using the 7P framework¹¹ representing different groups of service users, providers

and policy makers patients and public, providers, purchasers, payers, policy-makers, product makers, and principal investigators. The recommendations from the stakeholder engagement process led to modifications in our needs assessment plans aimed at improving design, dissemination plan, and further stakeholder engagement.

A core element of stakeholder engagement is the identification and prioritization of stakeholders.⁹ The 7Ps framework¹¹ helped us identify a comprehensive list of relevant stakeholders that are directly impacted by CVD or can influence CVD prevention and management. The discussion during the workshop and the post-workshop survey reaffirmed that the list was comprehensive; only a few additions were suggested. We updated our list and the additional members will be invited in subsequent meetings.

Our stakeholder engagement did not just aim to gather inputs but also worked to foster a long term a relationship throughout the subsequent steps of the needs assessment implementation and uptake of results. Stakeholder engagement is a complex and dynamic process. It is a fundamental step not just prior to any major policy formulation but also necessary throughout the process of program implementation, monitoring and evaluation.^{11,12} We, therefore, sought to involve different stakeholders at different levels. We forged a formal partnership between Kathmandu University School of Medical Sciences (the host institution of the PI) and the NHRC through a Memorandum of Understanding and the creation of the needs assessment task force co-chaired by the PI and the Executive Director of NHRC. This was aimed at creating an equitable relationship between stakeholders and decision makers.

Out of a total 33 recommendations, 21 contributed to improving the research plan. Other investigators have also reported to have improved research methods and process through stakeholder engagement.⁷ Further, engaging diverse group led to cover a wide range of recommendation. For example, government representatives highlighted the need to be mindful of the ongoing changes in the national health system due to the ongoing transition to the federal system and around aligning the assessment with continuously shifting government priorities. Representatives from academic institutions underscored the need of academia-policy linkages and suggested sharing research results via policy briefs. The patients emphasized the need for a referral system, improved health information system and broader access to health services. The pharmaceutical organizations emphasized the need to explore cost analyses of generic drugs and involving quacks as a respondent in assessing health utilization pattern at community level.

Almost half of the stakeholders were not clear about the purpose of the meeting before attending. Despite this, stakeholders described satisfaction and some expressed willingness to participate more frequently than planned. Almost all participants said that the workshop provided an open platform for the multi-sectoral group to co-learn from one another and shared the ideas. It helped to enhance research by incorporating expertise and ideas from a different perspective. Stakeholder engagement has been reported to empowering stakeholders in other settings.⁷

Many participants mentioned that it is challenging to commit time for contributing to the research. Some mentioned that continued engagement of the government officials would be difficult because they are transferred from one place to another within a short time. The challenge of time management has been reported previously. Snape et al. found significant disagreement between stakeholders on the purpose of engagement in research as well as its justification for ethical and patient empowerment grounds.¹³

We have engaged the stakeholders in early phase of our research. It has been argued that stakeholder partner engagement in early stages of the research process aids in the translation and interpretation of the findings, which ultimately increases the ‘actionability’ of research results.⁴⁻¹¹ By incorporating patients and other stakeholders as partners throughout the research process, they can effectively serve as early ambassadors of research efforts and subsequent findings, which may help to extend to audiences beyond peer-reviewed journals, and may facilitate increased uptake of results into the community and healthcare setting thereby accelerating its adoption into practice.

Our study has three major strengths. First, it provides a unique perspective on the national health system assessment (for CVD prevention and management) through stakeholder engagement in a low-income setting. Second, we report the process, immediate output and evaluation of an early-stage stakeholder engagement. Third, we have used evidence-informed frameworks to identify the relevant stakeholders; and to plan, implement and evaluate the engagement process, which has facilitated transparency and quality of stakeholder engagement in planning a research. This can facilitate understanding of the stakeholder engagement best practices. We have some limitations. We were not able to assess the intermediate level and long-term impact of the research because we are at an early stage of our research. In the future, we plan to evaluate the intermediate and long term outcomes using a standard framework. Another limitation is that we used a semi-structured questionnaire to evaluate the engagement process. It corroborates with other studies that have described the lack of robust tools available for evaluation of engaged research.^{7,8}

CONCLUSION

Our study reaffirms that stakeholder engagement can positively impact the design of a research. We received invaluable recommendations from stakeholders, which were incorporated to improve the needs assessment plan. We recommend that a structured evaluation of stakeholder engagement be developed and implemented in the future to accurately examine the intended success of stakeholder engagement. Although this study was small, it provides important insights for future researchers that aim to engage stakeholders in national level assessment programs in health.

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Highlights

- The stakeholder engagement process through small group discussions and a workshop positively impacted the design of our research.
- Eleven out of 27 recommendations from the workshop aimed to improve the research methods, 4 aimed to improve stakeholder engagement and 2 helped to expand the scope of dissemination.
- Most stakeholders noted that the workshop provided an open platform for a multi-sectoral group to co-learn from one another and share ideas.
- This study provides important insights for future researchers that aim to engage stakeholders in national level assessment programs in the healthcare system in Nepal.

Table 1.Conceptual model for understanding the impact of stakeholder engagement.³

Context	Processes	Immediate Outcomes	Intermediate Outcomes	Long term Outcomes
<ul style="list-style-type: none"> • Resources • Attitudes • Expectations • Inputs and Outputs sought 	<ul style="list-style-type: none"> • Stakeholder Recruitment • Composition • Decision making • Frequency of Engagement 	<ul style="list-style-type: none"> • Research questions • Methods • Analysis • Results • Interpretation • Dissemination 	<ul style="list-style-type: none"> • Research Value • Efficiency • Uptake • Ethics 	<ul style="list-style-type: none"> • Health outcomes • Patient decision-making • Health policy

Table 2.

Stakeholder mapping for the planning of national needs assessment for prevention and management of cardiovascular diseases

Types	Stakeholders	Purpose of Engagement
Patients and the public: Current and potential CVD patients their caregivers, families, and consumer advocacy organizations	<ul style="list-style-type: none"> • Heart Patient • Family member of heart patient 	Inform: Provide balanced and objective information to help them understand the needs assessment process, results and recommendations
Providers: Individuals (e.g., nurses, physicians, health counselors, pharmacists, and other providers of care and support services) and organizations (e.g., hospitals, clinics, community health centers, community-based organizations, pharmacies) that provide care to patients and populations	<ul style="list-style-type: none"> • Nepal Medical Association • Cardiac Society of Nepal • Nepal Nursing Association – representative • Nepal Health Professional Council–representative • Female Community Health Volunteer – representative 	Involve: To work with stakeholders throughout the process to ensure their feedback is incorporated
Purchasers: Employers, the self-insured, government and other entities responsible for underwriting the costs of health care	<ul style="list-style-type: none"> • Patient – out of pocket payers • Family member – out of pocket payers • Non-communicable disease section, Department of Health Services • Epidemiology and Disease Control Division, • Health Management Information System • National Health Training Center 	Collaborate: Partner in the needs assessment conduction: defining objectives, data collection, data analysis and interpretation
Payers : Insurers, others responsible for reimbursement for interventions and episodes of care	<ul style="list-style-type: none"> • MoHP-Health Insurance Board • MoHP – Nursing and Social Security Division • NGOs for CVD - representative 	Consult: Obtain inputs on the process, results and recommendations
Policy makers : National and Province level health planners and other policy making entities	<ul style="list-style-type: none"> • Ministry of Health and Population • National planning commission • Nepal Health Research Council 	Empower: Engage in the needs assessment process with shared power in decision-making process.
Product makers: Drug and device manufacturers	<ul style="list-style-type: none"> • Association of Pharmaceutical Producers of Nepal, Local Pharmacies • Department of Drug Administration, Nepal Chemist and Druggist Association • Private for profit provider – representative (Norvic) • Teaching hospitals (Nepal Medical College, NMC) 	Consult: Obtain inputs on the process, results and recommendations
Principal Investigators: Other researchers and their funders	Researchers	Empower: to engage in the needs assessment process with shared power in the decision-making process.

Table 3.

Recommendations during task force meetings and impact on the needs assessment plan

Recommendations	Responses	Impact on
1. Access the needs of the districts implementing Package of Essential Non-communicable diseases (PEN) separately.	Plan to purposively select half of the sample districts with PEN program	Design
2. Assess pharmaceuticals and medical supplies for CVD prevention and management	Added pharmaceuticals and medical supplies in the conceptual framework	Design
3. Increase role of government representative in implementing and interpreting the results to keep the assessment process aligned with the government's priority and to facilitate the uptake of the assessment results.	Invited two government representatives in the task force.	Stakeholder engagement
4. Clarify the role and power of Nepal of Health Research Council in the needs assessment plan	Jointly developed a detail terms of reference clarifying expectations, role and power of Nepal Health Research Council	Stakeholder engagement
5. Involve the CVD translational research fellows in the need assessment process to increase the scope of the study.	Conducted a workshop with CVD translational research fellows to explore their involvement	Stakeholder engagement

Table 4.**Recommendations during stakeholder workshop and impact on the needs assessment plan**

Recommendations	Response	Impact on
1. Assess the needs of CVD prevention and management at provincial level	Planned to stratify the data collection and analysis by the province	Design
2. Explore the prescription and availability of generic drugs as an option to lower drug cost	Added the metrics to assess the availability of generic drugs; and added questions in the key informant interview guide to explore the use of generic drugs	Design
3. Explore the challenges of implementing PEN package in terms of access to medicine and referral mechanism	Added a theme to explore barriers of PEN implementation	Design
4. Assess the availability of lifestyle modification programs at different levels of the health care system.	Added a theme to assess the availability and functioning of lifestyle modification programs	Design
5. Explore the referral mechanism to treat CVD complication	Added a theme to assess the availability and functioning of lifestyle modification programs	Design
6. Explore task shifting of CVD care and management from physicians to other health professionals	Added a theme to explore the perception, facilitators and barriers to task-shifting of CVD and hypertension patient care to paramedics.	Design
7. Assess the current role of non-licensed providers (quacks) in treating hypertension and diabetes.	Added quacks as one of the key informants to explore their role in hypertension and diabetes management in the community.	Design
8. Assess urban rural disparity in access to health care	Added urban rural disparity assessment in data analysis plan	Design
9. Assess knowledge regarding the availability and cost of health services among CVD patients.	Added a theme to explore health literacy among CVD patients	Design
10. Obtain health financing data from Social Health Security Section of Department of Health Services (DOHS)	Added the Social Health Security Section as a data source on health financing.	Design
11. Communicate the assessment findings with policy makers in short reports.	Added preparing and presenting research and policy briefs in the dissemination plan.	Dissemination
12. Disseminate the assessment findings to public using multiple portals	Added plan to disseminate the findings in the general meetings of social clubs and annual review meetings of the department of health services	Dissemination
13. Facilitate the use of assessment results by CVD translational fellows and other researchers	Planned to make the data and results available to the translational research fellows for further analysis	Stakeholder engagement
14. Add the department of health services (DoHS) and Department of health policy and planning (DoHPP) in the research team	Invited the representatives of DoHS and DoHPP in the task force	Stakeholder engagement
15. Involve National Health Training Center (NHTC) in the assessment process	Added NHTC on stakeholder roster and planned to invite them to subsequent meetings	Stakeholder engagement
16. Involve nutritionists and dieticians in the assessment process	Added a nutritionist on stakeholder and planned to invite them to subsequent meetings	Stakeholder engagement

Table 5.

The recommendations that were not included in the needs assessment plan

Recommendations	Reason
1. Collect primary data to map the situation of CVD in Nepal.	Resource limitation
2. Develop and evaluate treatment guidelines for managing hypertension, myocardial infarction, stroke and other CVD	Resource limitation
3. Quantify the health literacy, particularly CVD knowledge in the general population.	Resource limitation
4. Establish a nation-wide surveillance of myocardial infarction, stroke and rheumatic heart disease	Resource limitation
5. Estimate death and disability rates due to CVD using a population based survey.	Resource limitation
6. Conduct clinical trials to test effectiveness of various interventions on CVD management	Out of the scope of the study
7. Assess the quality of medicines available in the market	Out of the scope of the study
8. Quantify the antibacterial resistance at the population level.	Out of the scope of the study
9. Assess impact of fast food and high sugar beverage consumption on CVD rates	Out of the scope of the study
10. Assess school environments to develop CVD prevention strategy at an early age.	Out of the scope of the study
11. Register and monitor tonsillitis among children to prevent rheumatic heart disease	Out of the scope of the study
12. Prepare a lifestyle modification protocol to prevent and manage CVDs.	Out of the scope of the study

Table 6.

Challenges/Barriers and proposed ways to overcome them for stakeholder engagement

Challenges for Stakeholder Engagement	Structural Barriers
<ul style="list-style-type: none"> • Difficult to commit time • Uncertainty of the tenure of the government officials • Varying levels of pre-existing knowledge and expertise among stakeholders • Varying professional and personal aspirations among stakeholders which may not be relevant to the research process • Difficult to comprehend and incorporate feedback from a diverse group of people 	<ul style="list-style-type: none"> • Political uncertainty • Conflicting priorities of stakeholders
Overcoming Challenges for Stakeholder Engagement	Overcoming Structural Barriers with Facilitators
<ul style="list-style-type: none"> • Providing prior clear information to stakeholder and obtain inputs on specific issues • Engage stakeholders continuously throughout the process • When possible, have a written term of reference and/ or agreement • Clarify roles and responsibilities of the stakeholders • Plan for small group interactions where people can dedicate more time to discuss. 	<ul style="list-style-type: none"> • Present the burden and severity of CVD to stakeholders • Continuously communicate with the stakeholders, especially from the government using different means such as workshops, in-person consultations, emails, telephone

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