

# Health Research Priorities in Maldives

2022-2025

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# ABOUT THE REPORT

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### FUNDING

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# PREFACE

The Ministry of Health (MoH) is pleased to present the final report on health research priority areas of 2022-2023, developed in colluboration with the WHO Country Office. This report outlinks the methodology used to identify priority areas, the aim for choosing those specific areas, and includes the finalized health research priority areas at the event years.

Satisfy health research priorities is paid of health Ministry's methods. It is also objective stated for the National Health and Research Parky (2017). Establishing health research priorities as a lowerspan health priority and the state of the state of the developing health priorities and in priorities that addresses the needs of Malifives from a social, potient, and environmental point of issues of priority areas in 5 our belief that prioritical review and revision of issues of priority areas in the out the basis in addresses on the state of states and the states of the state of the state

While the development process of the current research priority areas stander to 220, be final/action process was greatly impacted due to the COVID-13 pandemic and subaequint restrictions, leading to many delays. The pandemic panthed area to an to find caraine solutions to finalize priority areas stor 2022 – 2023, leading to many leavy internal developments. In the end we finalized our research priorities by engaging stakeholders in discussions using an onfine approach in the last quarter of 2021.

The Ministry of Health thanks WHO for facilitating this project and our consultants from the Center for Tropical Medicine, UGM Indonesia, for their invaluable assistance in developing the health research priority areas for the next three years and compling this report.

Also, my sincere appreciation to our Health Information Management and Research Neam for their proactiveness and efforts in leading this project and conducting the research prioribization exercise. Lastly, L would like to thank all stakeholders from different sectors for their valuable input in finalizing the current research priority areas. Ve hoge that these areas aid in the strengthening of the Maldivian health sector.

Ahmed Naseem Minister of Health



# **EXECUTIVE SUMMARY**

Setting research priorities is the first key step to maximizing investments' impact, particularly in resource-limited settings. The aim of the priority setting process is to select among different options for addressing the most important health needs given limited resources and the challenges identified during the station analysis process.

The research proving agencia is a result of pair collaboration between the Ministry of Health of Madves, WHO County Office for Madves, WHO Madves, and the Centre for Tropical Medicine Universitias Gadgin Mada, Indonesia. The panel of experts represents the Ministry of Health, the National Health Research Council of Madves, health-released installators, academican, clinician, and non-governmental ergenizations. A total of 07 respondents particulated in the open survey and 22 centre participated in the Delphi survey.

The use of the Delphi method in this research priority settings has several advantages: a wide range of stakeholders in health were represented. Anonymity in the process encouraged honesty, and access to the result of an online survey provides a balanced consideration of ideas.

The priorities research list highlights the most impostant and upper needs to head research as indicated by all satestides involved in the study. We defined to head research priorities and 10 denies (Head Research and Head Research and Head Research Barners and definition) and the study of the study of the study of the study of the definition of the study of the study of the study of the study of the head in the study of the head in the study of stu

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## Top 10 health research priorities areas

| Disease epidemiology, risk<br>factors, prevention and<br>control         |
|--|
| Food and nutrition   |
| Healthcare quality and<br>safety.  |
| Health promotion   |
| Health resource allocation   |
| Advancement of health<br>technology, e-Health,<br>telemedicine           |
| Clinical studies   |
| Access to health care  |
| Health governance,<br>including clinical and public<br>health governance |
| Healthy lifestyle  |
|  |

# Top 10 clinical research priorities areas

| Cancer   |
|--|
| Cardiovascular diseases  |
| Mental health, behavioural<br>disorder, and substance<br>abuse |
| Kidney diseases  |
| Endocrine and metabolic<br>disorder, including diabetes        |
| Respiratory diseases   |
| Reproductive and maternal<br>health                            |
| COVID-19 and emerging<br>diseases                              |
| Sexual health  |
| Blood disorders  |
|  |

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# 1. INTRODUCTION

Research is an essential component that enables the improvement of health. The Woold Health Organization (WHO) has isofnelified for ways health systems can support health research: a) setting research priorities, b) building research capachy, c) defining norms and standards for research, and d) translating evidence into practice (WHO, 2013). Setting research priorities is the first key step to maintining investment' impoct, particularly in resource Intel setting.

Decision-making in the health sector is usually made at a muce lowel, whereas implementation is contracted at vulnous levels, going down to the velocity level (Hainer, 1997). Cri the other size, scientitics and chickness during hange and the sector of the sector of the sector of the sector implementation lastines of a sequence sectors. In the spontant to identify these gaps and propose ways to improve paralishin health, making and the sector of the sector sector is sector therefore, it would be useful for the vestigation to understand the most implement and previous gaps and the sector sector of the sector of a sector of the s

The aim of the priority-setting process is to select among different options for addressing the most important health needs given limited resources and the challenges identified during the situation analysis process. The process is inherently political, where societal values and goals are important, and resulting priorities reflect a compromise among stakeholders.



The Delphi survey was developed by the PAND corporation and first used in 1953 to dotain the construct on elevation unitary planning (Delkey A Helmen, 1967). These become a popular technique for identifying priority views and obtaining consensus on various topics in many disciplines. The Delphi method is a useful tool for identifying research priorities among levy astachediers on the changing landscape of the health system in the Maldwes, amidst and beyond the COVID-19 pandemic, producing recommendations to be shared with the public.

Some of the districture features of the research process are: a feature of a paired feature f

This report is structured according to the Reporting guideline for health research priority setting with stateholders (REPRISE) and is intended to inform researchers, policymakers, academidians, clinicians, health practitioners, and other relevant stakeholders about the key health priorities areas in the Maldives for the next three years.



# 2. CONTEXT AND SCOPE

The COVID-13 pandemic has had significant implications to scoles, including pack health ad adapti, Lie do kep and to the work, many counters across Asia are fund; challenges to contain the spread of the pandemic who maintaining the performance of other health programs. Researchers must adapt to the charging circumstances and challenges during and latter be appendemic. These calvages will affect the selection of research methodologies and piordry areas that may differ in locations, populations, or cultures experimencing different uncled of the pandemic. Therefore, we get a contained on the pandemic theory of the pandemic the pandemic theory of the pandemic th

The scope of research is divided into two areas: the first is research on public health and health system areas, and the second is research on clinical areas.

# **3. OBJECTIVES**

The scopes of this project are to:

- Identify health problems and barriers to health program implementations in the Maldives using an online questionnaire to key stakeholders and experts in health.
- Identify health research areas that have the potential to address the identified challenges using an online questionnaire to key stakeholders and experts in health.
- Determine priorities of health research areas and clinical research areas in 2022 to 2025, which have the potential to improve population health in the Maldives using a two rounds of Delphi survey.

# 4.GOVERNANCE AND TEAM

The project team consisted of public health and clinical experts, smins from the Markinsy of Health of Madives, members of the National Health Research Council of Madives, the WHO County Office for Madives, (WHO Madives), and the Centre for Tropcal Medicine Universities Galqish Mada, Indonesis. The consultant team on manach project setting, in collaboration with the WHO, the consultant team has been involved in developing serveril research proteints sended access the Sub Mark are rejon.

The questionnaires for the online survey and Delphi survey were developed by the consultant team them the Center for Topical Medicine Universitatic Galgiah Mada, Indonesia. They were peerreviewed by the steering committeite team then the Minsiary of Heahth of Maldives, the national Heahth Research Council, and the WHO Maldives teating publication. Results them the online survey and Delphi Survey were discussed with the steering committee testore the survey socceeded to the net ound.

The list of identified health research priorities and circlical research areas from the online survey asso circlated to the steering committee and expert panels for review to ensure all relevant areas of health synethysichic health and clinical areas were covered. A review of the previous national report on disease burden in the Maldiver save conducted to ensure that all high hunden disease groups were included in the priority clinical research areas. Ist. The steering convertee reviewerd newly added clinical areas.





# **5. INTENDED AUDIENCES**

There are three groups of intended sublences for this spoof. First, the instantion and limentational bank networkers or creations with their research opplications, who are the final decision-makers in splecting a sessarch teastion of the standard sessarch and the splecting and the splecting and sessarch or universite. Second is the bank providers, who can provide decisions to the researchers on the current protecties in directed health research and/or be directly involved in the research processes. The there is the government, including politicisms and polisymaters, who must neighted the direct compositions. The submit of the splece is the spleciment opplications, the submit of the specific direct and policy the opplications. The submit of the specific direct direct decolorminging for different set of the direct decolorminging for different set of the direct decolorming.

# **6. THE FRAMEWORK**

A conceptual hamework is essential to guide the research pointy-setting proteins. The Bimework can help dark the concept of analysis and can point is integrate to other relevant concepts, leading to ta better understanding point to integrate the setting of the setting of the setting of the point of the setting of the setting of the setting of the setting point of the setting of the setting of the setting of the setting point of the setting of the setting of the setting of the setting point of the setting of the setting of the setting of the setting of the point of the setting of the s



For the order same, respondence were invited to propose optimical about the proposed association in the same the most important harmers related to the proposed association in the same the same that problems, and unarrer balangess in conducting ensemble in the Madleus. Respondents were encouraged to satimit their responses using short semicones. The samelys approximate is the same spectra were approximately and the same terms of proposed in the same spectra were approximately and proposed in the same spectra were approximately and proposed in the same spectra were approximately approximately approximately approximately approximately approximately provide the same spectra opposed provide same spectra oppose



Figure 1: The health system dynamics framework

Taken from Chines J van Crief, et al. 2012. The Health Typiers Dynamics Pranewark. The indicatation of an analytical madel for health system analysis, and its antibadow to best case shades. Health: Calater and Society. 2013. 2:31. Mitro. Ritz and 23 50 MVHCL 2023.71

# 7. THE OPEN SURVEY

### Introduction

This is the first round in the research priorities setting process to collect researchers, health practitioners, and related stakeholders' opinions and identify initial priority health issues and implementation barriers that can be addressed through research on health system/public health and clinical areas.

Specific objectives of the online survey are:

1. To identify health problems and barriers to health program implementations

To identify research areas that have the potential to address the identified challenges

### The questionnaire

The survey was accessable online between November 20th to December 10th 2021, from the QuestionPro online survey platform. The questionnaire consists of hur open-ended questions that allow respondents to answer in open text format. Respondent was also encouraged to reflect on their current understanding of the situation of Madilvers's health system, the existing capacity and resources to provide health, and their knowledge, experimers, and understanding of the sizuation of the sizuation of the situation of the sizuation of the

- Q1: What do you think are the Maldives' three most important health problems? Example: diabetes, tuberculosis, covid-19 pandemic.
- Q2: What are the barriers to implementing health programs related to those health problems?
- Q3: Please propose a research topic that has the potential to address those barriers in the implementation of health programs.
- Q4: What are the barriers and challenges to conducting research in the Maldives?

Demographic questions were added in the last section of the questionnaire to identify respondent characteristics, i.e. age, gender, profession, location, and affiliation. Response to the demographic section was optional.



### The respondent

The inclusion onteria to be a potential respondent for the survey was discussed in a meeting between the steering committee team and the consultant team. Maximum variation sampling was applied to reach a wide range of stakeholders in the health care system. Respondents who gave consent and provide personal information but did not any ouscins were excluded from the analysis.

The MoH provided a list of potential respondents according to the agreed inclusion criteria. We sent an email invitation to a total of 185 key stakeholders from various departments in the Ministry of Health, the Health Protection Agency, the Maldives Food and Drug Authority, National Health Insurance Scheme, National Health Research Council, Maldivian Blood Service, Maldives Red Crescent, Aasandha , ADK hospital, Treetop Hospital, Indira Gandhi Memorial Hospital, Kulhudhuffushi Regional Hospital, Dr. Abdul Samad Memorial Hospital, Maldives National University. National Social Protection Agency (NSPA), Maldives Bureau of Statistics, the WHO Maldives UNICEE UNEPA Maldives Country Office Diabetes Society of Maldives Villa College, the Ministry of Higher Education, Ministry of Education, Society for Health Education, Ministry of Environment, the Islamic University of Maldives, Tiny Hearts of Maldives. Institute for Mental Well Being, and health practitioners, including general practitioner, specialist, dentist, nurse, midwives, laboratory analyst, psychologist, and community groups and leaders. Participation in this online survey was voluntary and anonymous. A reminder to participate in the survey was sent two days before the end of the survey period. The online survey was extended for one week to allow more respondents to participate.

Information about the survey and how the data will be used were informed in the email invitation and the introduction scenario of the questioner, informed concern was obtained before the respondent could proceed to answer the questions. We received responses from 56 participants, and 52 participants completed the questionnise (542-the response rate). There was no reinhument for respondents However, all respondents received the survey results and the list of priority research areas. See the characteristics of respondents in Table 1.

# **OPEN SURVEY**

### Table 1. Characteristic of respondents

| Viewers   |   | Number of responses | %     |
|---|---|---------------------|-------|
| Number of invitees  |   | 185                 | 100   |
| Number of survey viewers  |   | 170                 | 91.9  |
| Agree to participate in th                                      | e survey  | 96                  | 51.9  |
| Completed the survey  |   | 52                  | 28.1  |
| Responded to questions<br>survey                                | but not completed the                               | 15                  | 8.1   |
| Total respondent  |   | 67                  | 36.2  |
| Main Questions  |   |                     |       |
| Q1. What do you think is<br>ssues/health problems it            | the most important health<br>n Maldives?            | 67                  | 100   |
| Q2. What do you think is<br>barriers related with the<br>above? | the most important<br>proposed health problems      | 63                  | 94.0  |
| Q3. What research shou<br>those important health p              | roblems or barriers?                                | 58                  | 86.6  |
| Q4. What are the barrier<br>health research in the M            | s / challenges to conduct<br>aldives?               | 55                  | 82.1  |
| Characteristics of resp   | ondents   |                     |       |
|   | Yes   | 52                  | 77.6% |
| Q5. Are you a<br>Maldwian?                                      | No  | 1                   | 1.5%  |
|   | No answer   | 14                  | 20.9% |
|   | Atolis  | 2                   | 3.0%  |
| O6. Where do you live?  | Greater Male Regions                                | 49                  | 73.1% |
| Q6. Whiele do you live?   | Outside Maldives                                    | 2                   | 3.0%  |
|   | No answer   | 14                  | 20.9% |
|   | General Doctor/Medical<br>Specialist                | 5                   | 7.5%  |
|   | Dentist   | 0                   |       |
|   | Nurse/Midwife                                       | 6                   | 8.9%  |
|   | Medical Laboratory<br>Professional                  | 3                   | 4.5%  |
| Q7. Your profession is  | Community health<br>professional / Public<br>Health | 13                  | 19.4% |
|   | Professional of<br>behavioral sciences              | 2                   | 3.0%  |
|   | Pharmaceutical<br>professional                      | 0                   |       |
|   | Dietician   | 0                   |       |

| Viewers   |   | Number of<br>responses   | 96    |
|---|---|--|-------|
| Number of invitees                                    |   | 185  | 100   |
| Number of survey viewers                              |   | 170  | 91.9  |
| Agree to participate in the s                         | uwy   | 96   | 51.9  |
| Completed the survey                                  |   | 52   | 28.1  |
| Responded to questions bu                             | t not completed the survey                          | 15   | 8.1   |
| Total respondent                                      |   | 67   | 36.2  |
| Main Questions  |   |  |       |
| Q1. What do you think is th<br>Maldives?              | e most important health issues/health problems in   | 67   | 100   |
| Q2. What do you think is th<br>health problems above? | e most important barriers related with the proposed | 63   | 94.0  |
| Q3. What research should I<br>or barriers?            | be done to address those important health problems  | 58   | 86.6  |
| Q4. What are the barriers /<br>Maldives?              | challenges to conduct health research in the        | 55   | 82.1  |
| Characteristics of respon                             | dents   |  |       |
|   | res   | 52   | 77.6% |
| Q5. Are you a Maldivian?                              | No  | 1  | 1.5%  |
|   | No answer   | 14   | 20.9% |
|   | Atolis  | 2  | 3.0%  |
| D6. Where do you live?                                | Greater Male Regions                                | 49   | 73.1% |
| Qu. Millere up you mer                                | Dutside Maldives                                    | 2  | 3.0%  |
|   | No answer   | 185<br>170<br>96<br>52<br>15<br>67<br>67<br>63<br>58<br>55<br>55<br>52<br>1<br>14<br>2<br>49 | 20.9% |
|   | General Doctor/Medical Specialist                   | 5  | 7.5%  |
|   | Dentist   | 0  |       |
|   | NurserMidwife                                       | 6  | 8.9%  |
|   | Medical Laboratory Professional                     | 3  | 4.5%  |
|   | Community health professional / Public Health       | 13   | 19.4% |
| Q7. Your profession is                                | Professional of behavioral sciences                 |  | 3.0%  |
|   | Pharmaceutical professional                         | 0  |       |
|   | Academic professional                               | 12   | 17.9% |
|   |   |  |       |

### Table 1. Characteristic of respondents

|                           | Other, please specify:                      | 13 | 19.4% |
|---------------------------|---|----|-------|
|                           | Civil servant                               | 1  | 1.5%  |
|                           | Consultant                                  | 1  | 1.5%  |
|                           | Food safety field                           | 1  | 1.5%  |
|                           | Religious scholar                           | 1  | 1.5%  |
|                           | Administration/management at ministry level | 1  | 1.5%  |
| Q7. Your profession is    | Financing Institution                       | 1  | 1.5%  |
|                           | <ul> <li>Ministry of Health</li> </ul>      | 1  | 1.5%  |
|                           | <ul> <li>Accounts officer at MOH</li> </ul> | 1  | 1.5%  |
|                           | Monitoring Staff                            | 1  | 1.5%  |
|                           | <ul> <li>Finance and management</li> </ul>  | 1  | 1.5%  |
|                           | Civil service                               | 1  | 1.5%  |
|                           | Planning officer                            | 1  | 1.5%  |
|                           | Engineering                                 | 1  | 1.5%  |
|                           | No answer                                   | 15 | 22.4% |
|                           | 1-2 years                                   | 7  | 10.4% |
| OB. Number of years       | 3-5 years                                   | 6  | 8.9%  |
| yorked in primary area of | 6-10 years                                  | 12 | 17.9% |
| work                      | >10 years                                   | 27 | 40.3% |
|                           | No answer                                   | 15 | 22.4% |
|                           | Assandha Company Limited                    | 1  | 1.5%  |
|                           | Cancer Society of Maldives                  | 1  | 1.5%  |
|                           | Environmental Protection Agency             | 1  | 1.5%  |
|                           | Health Protection Agency                    | 1  | 1.5%  |
|                           | Indira Gandhi Memorial Hospital             | 3  | 4.5%  |
|                           | Institute for mental well-being             | 1  | 1.5%  |
|                           | tikandhar School                            | 1  | 1.5%  |
|                           | Islamic University of Maldives              | 2  | 3.0%  |
| 29. Institution or        | Maldives Bureau of Statistics               | 1  | 1.5%  |
| Organization              | Maldives Food and Drug Authority            | 1  | 1.5%  |
|                           | Maldivian Blood Services                    | 2  | 3.0%  |
|                           | Ministry of Health                          | 10 | 14.9% |
|                           | Ministry of Higher Education                | 2  | 3.0%  |
|                           | Society for Health Education (SHE)          | 3  | 4.5%  |
|                           | The Maldives National University            | 4  | 6.0%  |
|                           | UNICEF                                      | 1  | 1.5%  |
|                           | Utility Regulatory Authority                | 1  | 1.5%  |
|                           | Villa College                               | 1  | 1.5%  |

|                                    | WHO Maldives  | 2           | 3.0%  |
|------------------------------------|---|-------------|-------|
|                                    | Women's and Children's Health Network,<br>Adelaide    | 1           | 1.5%  |
|                                    | Not specific  | 12          | 17.9% |
|                                    | Education sector                                      | 1           | 1.5%  |
|                                    | ASMH  | 1           | 1.5%  |
|                                    | Government  | 2           | 3.0%  |
| 29. Institution or<br>Droanization | Health  | 1           | 1.5%  |
| organization                       | Institution   | 1           | 1.5%  |
|                                    | Privabe   | 2           | 3.0%  |
|                                    | Private college                                       | 1           | 1.5%  |
|                                    | Retired   | 1           | 1.5%  |
|                                    | • TTH   | 1           | 1.5%  |
|                                    | <ul> <li>Public and private sector and NGO</li> </ul> | 1           | 1.5%  |
|                                    | No answer   | 15          | 22.4% |
|                                    | Range   | 21-62 years |       |
| D10. What is your ape?             | 21-40 years   | 30          | 44.8% |
| 210. What is your age?             | 40-62 years   | 22          | 32.8% |
|                                    | No answer   | 15          | 22.4% |
|                                    | Male  | 7           | 10.4% |
| Q11. What is your gender?          | Female  | 45          | 67.2% |
|                                    | No answer   | 15          | 22.4% |

### Methods of analysis

Responses to the three key questions about the priority health issues, important challenges and proposed research areas were collected from the survey platform and exported to QSR International NVivo (version 12) for analysis processes. While most responses were submitted as short answers. Ion responses were also included in the analysis.

Open and axial coding to all text data viere performed in NVivo 12. Multiple coding was also applied to a text with multiple interpretations or relevancy to multiple categories. During the axial coding process, the created codes and underlying data were read over, removed, combined, or reframed. Revised codes were grouped into sub-categories and categories. The categories were prodetermined based on the health system characteris dama data were data over, the categories data on the peak system characteris dama data were data over, the categories and on the peak system characteris dama data over the modet minimal based on the health system characteris dama data were data over, the modet minimal based on the health system characteris dama data over the modet minimal based on the health system characteris dama data over the modet minimal based on the health system characteris dama data over the modet minimal based on the health system characteris dama data over the modet minimal based on the health system characteris dama data over the modet minimal based on the health system characteris dama data over the modet minimal based on the health system characteris dama data over the modet minimal based on the health system characteris dama data over the modet minimal based on the health system characteris dama data over the modet minimal based on the health system characteris dama data over the modet minimal based on the health system characteris dama data over the modet minimal based on the health system characteris dama data over the modet minimal based on the health system characteris dama data over the modet minimal based on the health system characteris dama data over the modet minimal based on the health system characteris dama data over the modet minimal based on the health system characteris dama data over the modet minimal based on the health system characteris dama data over the modet minimal based on the health system characteris data over thealth system data over the modet minimal ba

The list of sub-categories and axial codes was circulated to the steering committee and a panel of experts for review. The analysis process was repeated to ensure all relevant areas and proposed research areas suggested by the panel of experts and steering committee were included in the final is of health research areas.

### Results

A total of 28 heath research areas were identified from the online survey, which was categorized into six components of the health system dynamic framework. Alongside the list of health research areas, a new lot of clinical research areas was created, as suggested by the panel of experts, to highlight the importance of clinical research and the potential for research areas and the area.

### 1. Context

The Health system in each country is shaped by its political decision and historical change. An analysis of the national context encompasses a governance analysis, including the regulatory system, institutional arrangements, the organization of the public sector, and the influence of social determinants on health system outcomes and goals.

### a. Important issues

The context of the health system in the Maldives is influenced by the geographical presentation of the country, which consists of large and small islands, population distribution and an increase in the migrant population. Respondents also proposed cultural restantint, use of traditional medicine, and social resilience amid the COVID-19 pandemic as barriers to achieving good health outcomes.

### b. Barriers

Identified barriers to governance include poor decentralized governance, governance structure, regime, and lack of well-coordinated clinical governance. Cultural restraint toward metal health issues was proposed as an example of barriers to taking the problem seriously. The widespread population, including the various communities in atolis, will affect healthcare responsiveness; in onviding care to those with need it.

c. Proposed research areas (Table 2).

### Table 2. Proposed research areas in the category 'Context'

| No | Proposed research areas and axial codes  | Number of<br>relevant<br>responses |
|----|--|------------------------------------|
| 1  | Community resilience and addressing health of disodvantaged<br>psolution group.<br>Categories<br>Community dynamic<br>Urban health<br>Urban health<br>Social and geographical determinants, including culture and<br>traditions, coal relationes, and individual beliefs | 10                                 |
| 2  | Social determinants of health<br>Categories:<br>• Social factors affecting health status<br>• Individual and group characteristics<br>• Household expenditure for health   | 8                                  |

### 2. Leadership and Governance

Governance entails policy guidance to the whole health system, coordination of actors and regulations, optimal allocation of resources and ensuring accountability towards the population and stakeholders.

### a. Important issues

The responses initiated is leadership and governance were categorized inits four categorizelengendruss hip/lighted the importance of selection criteria and systems to appoint healthcare leaders in the leadership category. Concerns on health system accumability enranced, and they rest to instrand accountability rest provide the public health authorities health camp, performance accountability, and public perception of the public health authorities of solid concerns and the selection of the public health authorities and basis and public perception of the public health authorities and solid collow interfaction to ensure health and wellbein.

### b. Barriers

We identified some barriers related to the above issues, e.g. lack of coordination that affects the relation with health stakeholders to build an equitable health system, lack of political will and commitment to address priority health issues, failure to identify the root causes of health issues and lack of inclusive consultative process.

### c. Proposed research areas

| Table 3. Proposed research area | s in the category | 'Governance and Leadership |
|---------------------------------|-------------------|----------------------------|
|---------------------------------|-------------------|----------------------------|

| No | Proposed research areas and axial codes  | Number of<br>relevant<br>responses |
|----|--|------------------------------------|
| 1  | Accountability and fraud in healthcare<br>Categorine:<br>• Health system accountability<br>• Fraud in Medicare   | 8                                  |
| 2  | Health governance, including clinical and public health<br>governance<br>Categories:<br>Structure and coordination of governance in health system<br>• Montening and evaluation system<br>• Governance and management challenges for priority health | 16                                 |
| 3  | Health policy formulation and implementation<br>Categories:  | 10                                 |
| 4  | Health planning<br>Categories:<br>• Evaluation and improvement of healthcare planning process<br>• Health information system for timely evidence-based decision<br>making  | 8                                  |
| 5  | Political commitment for health improvement<br>Categories:<br>• Evaluation and improvement of policy makers awareness on<br>important health issues<br>• Evaluation of political commitment on health issues   | 10                                 |

### 3. Resources

Resources included in this theme are financing, human resources, infrastructure, supply of pharmaceuticals, goods, technologies, information, and knowledge.

### a. Important issues

Lack of statistable funding and investment for the health system were mentioned as the most important issue, as well as barries to beharbare improvement. Other escaratial issues include human resources availability and its distribution to rural areas, new technology and immodule in health care, healting the potential of digital health or telementaries to bright the access to care, and the availability of integrated and comprehensive health data for actions and policy decision making.

### b. Barriers

Lack of access to adequate healthcare facilities, subvaced medical equipment, and speciality care was mentioned as the barriers to reaching better health adcomes. Lack of human resources and access to instanticular to preventive healthcare was also mentioned happropriate resource adlocation, netther evidence-based or result-based, possibly contribute to its potehm. The suprogradion system and wablibity of advacations accommodiation during treatment visits were also mentioned as barriers to access health care for people from rural atros.

The use of innovation and technology for health promotion, diagnosis and treatment were recognized as improving health scales and expansion across the need for digital health infravorments and expansion across the country, However, he lack of clear digital health infravortance to implement e-terketh inflatives in various health sectors and limited update of telemedicine by healthcare professionals remains the crucial current challenges.

Inadequate digital infrastructure leads to a lack of integrated and comprehensive health data for actions and policy decision making. Access to routine data, such as cancer registry, routine data from health facilities, incidence and prevalence of priority diseases and periodic health data collection through baseline health surveys are also needed.

Weak training strategy and lack of implementation plan contribute to the scarcity of trained immuna resources in traditories, particularly in runal areas. Lack of qualified interest in the development of non-medical healthcare professional also contribute to the lack of qualified immunar resources in other healthcare (bdfs, such as resolved)agid, mental health professionals, health in other healthcare (bdfs, such as resolved)agid, mental health professionals, health professional development, and lack of human resource development funding are other existing barters. There are also challenges in recruiting and retaining competent health professionals in rural areas. Unavailability of a clear strategy to attract proficient human resources and adequate incertive to retain and motivate local staff have created larger gaps in to access quality healthcare in rural areas.

Inadequate sustainable funds allocated for health care are also a prominent issue contributing to all of the barriers above.

### c. Proposed research topics

### Table 4. Proposed research areas in the category 'Resources'

| No | Proposed research areas and axial codes   | Number of<br>relevant<br>responses |
|----|---|------------------------------------|
| 1  | Advancement of hoolth technology, E-Health, and<br>telemedicine<br>Categories<br>• Evaluation and improvement of digital health infrastructure<br>• Improving access to telemedicine / telehealth   | 17                                 |
| 2  | Health Financing<br>Categories<br>E valuation thealthcare spending/seponditure and its impact to<br>population finality<br>E valuation of fulling fac health research and its impact<br>- Cost benefits tudy of regulating unhealthy products and<br>behaviors            | 26                                 |
| 3  | Health Information<br>Categories<br>E pickensbogy studies on communicable and non-<br>communicable disease<br>Building integrated disease registry lexample cancer. NCDL TB)<br>- Use of integrated and competensive digital health data for<br>research and policymaking | 24                                 |

| No | Proposed research areas and axial codes   | Number of<br>relevant<br>responses |
|----|---|------------------------------------|
| 4  | Health Resource allocation           Categories:         •           •         Evaluation of allocation and access to health resources in rural and urban areas           •         Need assessment and use of advanced medical equipment   | 26                                 |
| 5  | Human resources for health<br>Categories<br>E Isolation of barriers and ways to attract and retain proficient<br>health professionals to work in rural areas<br>E Isolation entendists to maintain and improve competency of<br>HRH<br>E Isolation of remuneration and incentive mechanism/policy | 50                                 |

### 4. Service Delivery

Service delivery is defined as the process through which providers, health facilities, programmes, and policies are coordinated and implemented to reach the health system's goals. It relates to services and activities that include primary prevention, casted prevention, casted and activities that include primary prevention.

### a. Important issues

Healthcare services need to be available equally and easily accessible in forester Male and order laders in a many manner. Lack of accessibility to speciality or tertary care and private healthcare ballices is concerning for many respondencis. Weaking time for a speciality doctin in a public hospital is too long, while speciality care in private health facilities is more accessible, but they are expensive and primarity available in the greater Male area and not in other valands.

Strengthening the focus of the health system on primary health care and improving the model of health care delivery were also identified. The current model of care delivery was considered to hinder sustainable and continuous care. The lack of a proper public health system and content a better bahave between public health programs and dinical care. Preventive health measures are also considered lagging, particularly in the control of noncommunicable diseases. Other important issues include health awareness and people's behaviour related to education level, and their knowledge, attitude, and health practice. Harmful traditional practices are still existing and can lead to short and long-term health consequences.

### b. Barriers

Early detection of diseases and access to necessary treatment is needed to improve health uncomes. However, lick of access to proper tetrain, grow qualing time, lick of advanced medical equipment, lick of competent human resources, and difficulty to access speciality or tetrainy cream for innely treatment have demotisted proper to vite healthcare facilities unless they are very sick, or wert abroad to seek treatment. Private healthcare providers are expensive and not available on many utands.

The poor health system setup was mentioned as one of the barriers which can lead to a lack of proper public health system, lack of public awareness of health issues, and lack of community engagement. There is a need to change the overall focus of the health care system on primary health care, which ensity hormolion, preventive healthcare, and public health at the centre. Limited health promotion and advocasy contribute to low health awareness and unhealthy behaviour that justifies the need to strengthen health promotion.

Change in the health system will also bring changes in health care delivery. Several barriers in health care deliveries have been identified, e.g. lack of comprehensive referral mechanism, tedious procedures, individual/societal beliefs in health providers, lack of implementation plan of public health programs, and challenges of care deliveries during the COVID-19 pandemic.

### c. Proposed research areas

Table 5. Proposed research areas in the category 'Service Delivery'

| No | Proposed research areas and axial codes   | Number of<br>relevant<br>responses |
|----|---|------------------------------------|
| 1  | Access to hash care<br>Categorie<br>Evaluation of access to health care services, in rural and urban<br>areas, including Basic health care services, laboratory testing,<br>including and access to health care services, and the<br>including accessibility, and affordability of private healthcare<br>facilities | 33                                 |
| 2  | Model of healthcare deliveries<br>Categories<br>E solution of model and roles of primary healthcare in clinical<br>and public health services<br>I interventions and innovations for health system strengthening<br>Esolution of referral machanism, involving private health care<br>providers                     | 23                                 |
| 3  | Preventive health core<br>Categories:<br>• Evaluation of funding and public health measures for<br>preventive healthcare<br>• Improving access to preventive medicine/treatment   | 10                                 |
| 4  | Traditional medicine<br>Categories:<br>• Describe the prevalence and practice of harmful traditional<br>practices   | 2                                  |
| 5  | Pharmaceutical study  | Additional<br>category             |

### 5. Outcomes

Outcomes is defined as the direct results of the organization of health care delivery, e.g. universal coverage, quality of care and responsiveness, and goals as the expected impact in terms of improved physical, mential and social wellbeing. The outcomes of a health system also include access and coverage, which are important determinants in utilising health services.

### a. Important issues

We lottely eight heaht hopics relevant to heaht nutcomes and gools, i.e. hunden of communicable discasses, monocomentable discasses, environmentable, positich heaht, mattemal and child health, mental heaht, sosual and reproductive heaht, and gorden-based violence. Important sub-lopics within the communicable discasse group include COVID-19, memping and message discasses, antimicrobian estastance (ARH), and reproductive the elegativity conditions. (Adhma, COPD, upper respiratory tract infection, and lower respiratory tract infection air colition).

Whith the non-communicable diseases group, respondents identified cancer, cardiovascular diseases, diabetes, kidney diseases, hypertension, blood disorders, and neurological conditions as the priority diseases. Many respondents were also interested in looking at the causes of the high burden of communicable and non-communicable diseases, identifying barriers and enables for goot healthcen, and strategies to control these diseases.

Maternal and child health also gained respondent's attention, despite the lack of specification of the problem. In the sexual and reproductive health group, several respondents raised the issue of sexual reproductive health among young people, and increasing infertility rate and health sector response to gender-based violence and child abuse.

The increasing elderly population is another issue that needs to be accommodated in the changing heads hystem to meet their heads. Air politican and the king environment were also part of the environmental heads insue. Namy respondents highlighted a hage increase in metal heads in text with Addres, while focus on metal heads in its lacking. Specific issues related to metal headh mentioned in the survey were psychosocial factors, substance abuse and suicide.

The issue of quality of care and patient safety was also raised, with suggestions to evaluate the implementation of Maldives Healthcare Quality Standards, accreditation system, and medication errors.

### b. Barriers

Health spatial barries related to communicable diseases include implementation challenges of disease control programmes, walifelibly of data to obtain of diseases. The disease of COVD-19 to other health programmes. While the non-communicable diseases grave, prevention and associated complications were selected as the non-common barries de diseases. To other automatics were advected as the the barriers to service delivery, with includes accessibly to mattema barbane, kick of program data costency and or barbane ap delice health issue, access to telehealth for genicine patient, and lack of community health muse that can avoid how can avoid as the obtem oracity and and the canone and patient barbane. The other proteine patient, and lack of community health muse that can avoid the canone canone size the other does does and the canone barbane. The other proteine patient, and lack of community health muse that can avoid the canone canone size the other does does and the canone barbane. The other proteine patient patient and the canone barbane. The other patient patient patient patient and the canone barbane. The other patient patient patient patient and the canone barbane canone and the other barbane b

Barries related to mercla health are signa on mercla health issues, lack of emphasis on proper mercha healt cace, and lack of transfe health professionab. Within the quality and safety groups, the respondents mentioned the limited regulation of the quality and safety of care, lack of experts in guality and safety, and lack of attempt encourse to clinical protections, as barriers to good quality of cace. Another barrier that influences priority making is the lack of evidence from local research due to limited funding for research.

### c. Proposed research areas

Table 6. Proposed research areas in the category 'Outcomes'

| No | Proposed research areas   | Number of<br>relevant<br>responses |
|----|---|------------------------------------|
| 1  | Disease epidemiology, risk factors, prevention and control              | 18                                 |
| 2  | Clinical studies on priority communicable and non-communicable diseases | 102                                |
| 3  | Environmental health  | 4                                  |
| 4  | Healthcare delivery for aging population                                | 3                                  |
| 5  | Healthcare quality and safety   | 6                                  |
| 6  | COVID-19 and emerging diseases  | 23                                 |
| 7  | Gender-based violence   | 6                                  |

The nost Request responses to the celles survey were clinical research on priority communicated and non-communicated decises (LCI expressions). Junity for experiment comutation meeting, it was decided to invite more christians from hospitals to the parel of experts to expand the scope of clinical research means. New research meas were also added the meshering the Matthews heaptimeters are been as the second means were also added the relevant of the Matthews heaptimeters are particular to the second beam of the second beam of the least scoper elimination of the particular second means the factor scoper elimination provides and persons the Matthews.

| Table 7. Propose | d research | h areas in th | e category | v 'Clinical Research |
|------------------|------------|---------------|------------|----------------------|
|------------------|------------|---------------|------------|----------------------|

| No | Proposed clinical research areas                         | Number of<br>relevant<br>responses |
|----|--|------------------------------------|
| 1  | Mental health, behavioural disorder, and substance abuse | 42                                 |
| 2  | COVID-19 and emerging diseases                           | 25                                 |
| 3  | Reproductive and maternal health                         | 13                                 |
| 4  | Endocrine and metabolic disorder, including diabetes     | 10                                 |
| 5  | Sexual health  | 10                                 |
| 6  | Cancer   | 9                                  |
| 7  | Digestive diseases                                       | 9                                  |
| 8  | Neurological disorders                                   | 6                                  |
| 9  | Respiratory diseases                                     | 5                                  |
| 10 | Blood disorders  | 4                                  |
| n  | Kidney diseases  | 4                                  |

| No | Proposed clinical research areas      | Number of relevant<br>responses |
|----|---------------------------------------|---------------------------------|
| 12 | Allergy                               | 3                               |
| 13 | Bone and joint diseases               | 3                               |
| 14 | Eye diseases                          | 3                               |
| 15 | Cardiovascular diseases               | 3                               |
| 16 | Genetic disease                       | 3                               |
| 17 | Skin diseases                         | 3                               |
| 18 | Genitourinary diseases                | Additional category             |
| 19 | Dengue                                | Additional category             |
| 20 | Perinatal conditions and child health | Additional category             |
| 21 | Neglected Tropical Diseases           | Additional category             |
| 22 | Tuberculosis                          | Additional category             |
| 23 | Leprosy                               | Additional category             |

### 6. Population

The population includes patients, individuals having rights and obligations for healthcare, and the various groups in the community, including peer groups and informal caregivers.

### a. Important issues

Lack of community awareness, lack of community engagement in healthcare, and unhealthy lfestyle are topics identified under the population group. Lack of awareness and engagement were linked with nealth promotion strategy and health outcomes. While unhealthy lifestyles were linked with unhealthy eating habits (lack of fruits and vegetables), lack of physical activity, stressful life, and living style.

### b. Barriers

Some barries related to healthy lifestyle were unhealthy eating habits, lack of organic food, lack of affordable locally harvested fruits, influence and interference from food, beverage and tobacco industries, unavailability of cheaper gym attematives, and lack of awareness of the consequences of unhealthy behaviour. Inadequate regulation and monitoring of food production, said, and marketing were also mentioned as the barriers.

### c. Proposed research topics

### Table 8. Proposed research areas in the category 'Population'

| No | Proposed research areas  | Number of<br>relevant<br>responses |
|----|--|------------------------------------|
| 1  | Community engagement in health   | 4                                  |
| 2  | Food safety and quality<br>Categories:<br>• Total distary and food consumption survey  | 18                                 |
| 3  | Health promotion<br>Categories:<br>• Innovative health promotion strategies, including use of<br>technology for health promotion.<br>• Access to health promotion and advocacy | 21                                 |

| No | Proposed research areas   | Number of<br>relevant<br>responses |
|----|---|------------------------------------|
| 4  | Healthy lifeztyle<br>Categorie:<br>• Behavioral survey to identify healthy and unhealthy behavior<br>• Innovative Intervention/stratogy for lifestyle modification<br>• Implementation of strategy to improve physical activity | 4                                  |

# 8. DELPHI SURVEY ROUND 1: Selection of research priorities areas

The previous online survey is the initial step to collecting opinions on priority arease in health tron key stateholders and practicitors in the Madkines. A qualitative analysis process to the responses from the online survey has resulted in a last of 28 health research areas. The last may reflect 'violes' from the field' about important health issues that need proper attention from the government. It may inform a panel of expirts before selecting priorities research areas.

A ten numb Dephi survey was regarized to select priority research areas from the last blance. Dephi survey is an inderet, aronyomic, metanely process designed to pool sources, and an experimental selection of the selection of the selection of the provide index lawaye. The experim in the parel wave selected purposely to respect a variety of heath accessor and law standbacks. The selection parel of experts in twind to participate on a volutary basis to complete a questionnee and antimental provides the selection of the selection of the selection and participate of the selection of the selection of the selection of the advantage over an oxidar basis basis of the selection of the period of order.

### Objective

The objective of the first round of the Delphi survey was to select 10 out of 28 research areas identified from the online survey.

### Panel of experts

The steering committee identified and contacted prospective experts. Invitation to participate in the Delphi Survey, both for round 1 and 2, and an intermet link to the survey platform were sent via email. Participation was anonymous to other participants, voluntary and unabali, and participants could withdraw at any time.



A baid of Theath experts were mixed, and 21 participant in the first round of the Delph sumy. The soletical experts were from the Mixetry of Heath (b), the Matthews Estational University (4), World Heath Organization (7), Matthews tood and drug authority (7), Heath Intercention approx (PMC) (1), Matthews Essense (3) Stations (2), Matthews Genes Office (7), Heathers Essense (3), Matthews Essense (3), Stations (3), Matthews (3), Stations (3), Matthews (3), Matthews Essense (3), Matthews (3), Matthews (3), Matthews (3), Matthews (3), Matthews (3), Stations (3), Matthews (3), Matthews (3), Matthews (3), Matthews (3), Stations (3), Matthews (3

### The questionnaire

An online questionnaire was created on the QuestionPo Survey platform. All participating experts received the results of the privatous online survey, and we encouraged them to read it before making their research priorities, information about the Delphi survey process and issues related to efficies were provided in the introduction part of the questionnaire. One member of the steering committee was assigned to be the contact person if respondents had an inquiry about the survey. Consent was obtained before a ancitance could encould be the usersion; cause.

The questionnaire contains only two assignments and four columns to collect information about the characteristics of respondents (first name, last name, email addresses, and institution)

### Statement of the first assignment:

"Please select ten research areas out of 28 research areas from the list below. Numbers in brackets indicate the number of opinions that support the research area from the results of the preliminary survey. Score 1 will be given to selected research areas."

### Statement of the second assignment:

"Please select ten diseases that should be prioritized for research and health development in the Maldives."

### Survey process

The first Delphi survey was stated with a one-hour meeting with a panel of experts on January 18th, 2022. The panel reviewed the questionnaire and the available options for pilority research areas for the Delphi survey round 1 and gave oral and writtin feedback. All feedback were discussed by the steering committee and the consultant team, then the questionnaire was revised.

All experts were invited to participate in the Delphi survey round 1, and we received responses from 22 experts. The number of vote for each research areas were summed and listed from the highest votes to be lowest vote.

| No | Institution                      | Total respondents |
|----|----------------------------------|-------------------|
| 1  | Universities                     | 8                 |
| 2  | Ministry of Health               | 5                 |
| 3  | Ministry of Islamic Affair       | 1                 |
| 4  | Attorney General Office          | 1                 |
| 5  | Maldives Bureue of Statistics    | 1                 |
| 6  | Maldives Food and Drug Authority | 1                 |
| 7  | World Health Organization        | 1                 |
| 8  | HPA                              | 1                 |
| 9  | IGMH                             | 1                 |
| 10 | Dhamanaveshi                     | 1                 |
|    | Total                            | 21                |

Table 9. Characteristics of respondents of Delphi Survey round 1

### Table 10. Selected health research priority areas

| No | Research areas  | Number<br>of votes |
|----|---|--------------------|
| 1  | Disease epidemiology, risk factors, prevention and control (supporting<br>opinions: 18)                   |                    |
| 2  | Health governance, including clinical and public health governance<br>supporting opinions: 16)            |                    |
| 3  | Healthcare quality and safety (supporting opinions: 6)  | 12                 |
| 4  | Healthy lifestyle (supporting opinions: 19)   | 12                 |
| 5  | Access to health care (supporting opinions: 33)   | 12                 |
| 6  | Clinical studies (supporting opinions: 102)   | 11                 |
| 7  | Food and nutrition (supporting opinions: 18)  | 11                 |
| 8  | Preventive healthcare (supporting opinions: 10)   | 11                 |
| 9  | Health promotion (supporting opinions: 21)  | 10                 |
| 10 | Advancement of health technology, e-Health, telemedicine (supporting<br>opinions: 17)                     |                    |
| 11 | Health resource allocation (supporting opinions: 26)  | 10                 |
| 12 | Health policy formulation and implementation (supporting opinions: 10)                                    | 9                  |
| 13 | Human resource for health (supporting opinions: 50)   | 9                  |
| 14 | Model of healthcare delivery (supporting opinions: 23)  | 9                  |
| 15 | COVID-19 and emerging diseases (supporting opinions: 23)  | 8                  |
| 16 | Community resilience and addressing health of disadvantaged population<br>group (supporting opinions: 10) |                    |
| 17 | Health financing (supporting opinions: 26)  | 7                  |
| 18 | Accountability and fraud in healthcare (supporting opinions: 8)   | 6                  |
| 19 | Political commitment for health improvement (supporting opinions: 10)                                     | 6                  |
| 20 | Health care delivery for aging population (supporting opinions: 3)  | 5                  |
| 21 | Environmental health (supporting opinions: 4)   | 5                  |
| 22 | Community engagement in health (supporting opinions: 4)   | 4                  |
| 23 | Health information (supporting opinions 24)   | 4                  |
| 24 | Social determinant of health (supporting opinions: 8)   | 3                  |
| 25 | Health planning (supporting opinions: 8)  | 3                  |
| 26 | Pharmaceutical study (additional area)  |                    |
| 27 | Gender-based violence (supporting opinions: 6)  | 1                  |
| 28 | Traditional medicine (supporting opinions: 2)   | 1                  |
| 29 | Other:  | 0                  |

#### Table 11. Selected clinical research areas

| No | Research areas   | Number of<br>votes |
|----|--|--------------------|
| 1  | Mental health, behavioural disorder, and substance abuse<br>(supporting opinions: 42)          | 21                 |
| 2  | Cancer (supporting opinions: 9)  | 20                 |
| 3  | Reproductive and maternal health (supporting opinions 13)                                      | 15                 |
| 4  | Kidney diseases (supporting opinions: 4)   | 15                 |
| 5  | Sexual health (supporting opinions: 10)  | 13                 |
| 6  | Endocrine and metabolic disorder, including diabetes (supporting<br>opinions: 10)              | 13                 |
| 7  | Respiratory diseases (supporting opinions: 5)  | 10                 |
| 8  | Cardiovascular diseases (supporting opinions: 3)   | 9                  |
| 9  | Skin diseases (supporting opinions: 3)   | 9                  |
| 10 | COVID-19 and emerging diseases (supporting opinions: 25)                                       | 8                  |
| 11 | Blood disorders (supporting opinions: 4)   | 8                  |
| 12 | Dengue (added from the Maldives Health statistics 2017-2019)                                   | 7                  |
| 13 | Perinatal conditions and child health (added from the Maldives<br>Health statistics 2017-2019) | 7                  |
| 14 | Eye diseases (supporting opinions: 3)  | 7                  |
| 15 | Neurological disorders (supporting opinions: 6)  | 7                  |
| 16 | Tuberculosis (towards elimination of tuberculosis in Maldives)                                 | 6                  |
| 17 | Genetic diseases (supporting opinions: 3)  | 6                  |
| 18 | Allergy (supporting opinions 3)  | 6                  |
| 19 | Digestive diseases (supporting opinions: 9)  | 5                  |
| 20 | Bone and joint diseases (supporting opinions 3)  | 5                  |
| 21 | Neglected Tropical Diseases (additional group)   | 5                  |
| 22 | Cenitourinary diseases ( added from the Maldives Health statistics<br>2017-2019)               | 3                  |
| 23 | Leprosy  | 2                  |
| 24 | Other, please describe:<br>Prevalence of malnutrition among the elderly/under 5 children       | 2                  |

# 9. DELPHI SURVEY ROUND 2: Ranking of research priorities areas

The first round of the Delphi survey has resulted in 10 health research areas and 11 clinical research areas. Determining a ranking for each panel of research areas is one way to display priority. It is usually challenging to reach a consensus on priorities due to conflicting interests, scope and perspectives. An alternative to reach a consensus is by assigning a rank based on certain criteria to a panel of priority.

#### Objective

- · To assign a rank to each research area
- To create lists of health research areas and clinical research areas based on the rank.

## Panel of experts

We invite experts who participated in the first round of the Delphi survey to continue participating and rank the selected research areas. Out of 22 experts who participated in the Delphi survey round 1, 16 participated in the Delphi survey round 2.

Table 12. Participants of Delphi Survey round 2

| No | Institution                      | Total respondents |
|----|----------------------------------|-------------------|
| 1  | Universities                     | 5                 |
| 2  | Ministry of Health               | 5                 |
| 3  | Ministry of Islamic Affair       | 1                 |
| 4  | Attorney General Office          | 1                 |
| 5  | Maldives Food and Drug Authority | 1                 |
| 6  | World Health Organization        | 1                 |
| 7  | Maldives Food and Drug Authority | 1                 |
| 8  | Dhamanaveshi                     | 1                 |
|    | Total                            | 16                |



#### The questionnaire

An online questionnaire was created on the QuestionPo Survey platform. All participating experts received the results of the first roat of the Delphi survey, and we encouraged them to read it before participating in the second round. Information about the Delphi survey process and issues related to enticity emproved in the intraduction part of the questionnaire. Come member of the steering committee was assigned to be the contact person if respondents inguine about the steering committee was assigned to be the contact person if respondents inguine about the survey. Consent was collained before a participater could proceed to the questions part.

The questionnaire contains only two assignments and four columns to collect information about the characteristics of respondents (first name, last name, email addresses, and institution)

#### 1.Statement of the first assignment:

"Please rank (1-10) the following health research areas in order of priority. The number in brackets indicates the number of respondents voted for the area in the first stage of the Delphi Survey."

#### 2.Statement of the second assignment:

"Please rank (1-11) the following clinical research areas in order of priority. The number in brackets indicates the number of respondents voted for the area in the first stoge of the Delphi Survey."

#### Survey process

The survey was conducted online between 14 – 17 March 7022. Respondent assign a rank from 10 to 10 for the heat mean treased name and the instance in a stranger than the score is given opposite to the rank value, i.e. rank 1 was scored 10 and rank 10 was scored 3. Rank 11 in the initial research panel was scored 0. The median of the assigned rank was used to determine which research areas have the higher rank when there are two research areas with the same total score. Classification of health research in this prioritizing exercise refers to research that is done to learn more about human health. Health research studies the distribution and determinants of the health status of the people as influenced by social, economic, and physical environments, human biology, health policy and services. Health research also aims to find better ways to promote, revert and tract diseases by enhancing the efficiency and feetingeness of the health system.

| Ranks | Health areas  | Scores | Median     |
|-------|---|--------|------------|
| 1     | Disease epidemiology, risk factors, prevention and<br>control (Votes: 16)         | 114    |            |
| 2     | Food and nutrition (Votes: 11)  | 94     |            |
| 3     | Healthcare quality and safety. (Votes: 12)  | 93     |            |
| 4     | Health promotion (Votes: 10)  | 89     | Median 5.5 |
| 5     | Health resource allocation (Votes: 11)  | 89     | Median 6   |
| 6     | Advancement of health technology, e-Health,<br>telemedicine (Votes 10)            | 87     |            |
| 7     | Clinical studies (Votes: 11)  | 85     |            |
| 8     | Access to health care (Votes: 11)   | 82     |            |
| 9     | Health governance, including clinical and public<br>health governance (Votes: 12) | 78     |            |
| 10    | Healthy lifestyle (Votes: 12)   | 75     |            |

#### Table 13. Top 10 health research priorities areas

Classification of chical research in this prioritizing exercise involves research unsing human volunteers participation that is intended to advect mode advectively chical grind ratio and observations randes. In a chical that, participants receive specific interventions, i.e. medical products, procedures, and behaviour change, according to the research product research by the investigator. Clinical traits can compare a new medical approach in a standard one, or b a participation of the standard sta

| Ranks | Clinical areas  | Scores |
|-------|---|--------|
| 1     | Cancer (Votes: 20)  | 108    |
| 2     | Cardiovascular diseases (Votes: 9)                                      | 106    |
| 3     | Mental health, behavioural disorder, and substance abuse (Votes:<br>21) | 105    |
| 4     | Kidney diseases (Votes: 15)   | 89     |
| 5     | Endocrine and metabolic disorder, including diabetes (Votes: 13)        | 86     |
| 6     | Respiratory diseases (Votes: 10)  | 83     |
| 7     | Reproductive and maternal health (Votes: 15)                            | 81     |
| 8     | COVID-19 and emerging diseases (Votes: 8)                               | 68     |
| 9     | Sexual health (Votes: 13)   | 62     |
| 10    | Blood disorders (Votes: 8)  | 53     |
| 11    | Skin diseases (Votes: 9)  | 43     |

Table 14. Top 11 Clinical research areas

# 10. BARRIERS AND CHALLENGES IN CONDUCTING RESEARCH

After completing the main three questions about the most important issues, barriers, and challenges in health, we asked the respondents to give their opinion about the barriers and challenges for research in the Maldives. Each respondent can submit 1 to 3 short statements. We received responses tion 55 respondents and 107 short statements about the barriers and challenges in conducting research.

#### The question:

"What are the barriers / challenges to conduct health research in the Maldives?

#### Data analysis

All responses were analyzed qualitatively. Open codes were assigned to all statements, and axial coding was performed to combine or reframe the codes to create categories of barriers and challenges in conducting research in the Maldives.

#### Results

We identified seven main barriers and challenges in conducting research in the Maldives.

#### 1.Access to data

We identified five quotes related to lack of data availability for research, due to lack of documentation, lack of base information (e.g. cancer registry), and difficulty getting data from different organizations.

### 2.Difficulties in getting ethics approval

Getting ethical approval from the NHRC is difficult and takes a lot of time. The process can delay the implementation of planned research activities and demotivate researchers to conduct independent research.

#### 3. Lack of demand for scientific evidence for decision making

Lack of political commitment to really dig deep and address the root causes of a health problem and lack of understanding of the importance of research have led to a lack of evidence-based decision-making at policymaking levels. The unwillingness of policymakers to listen to experts has discouraced excerts from envidence evidence.

#### 4. Lack of human resources

Lack of strategies to train personnel / professional in research has led to a shortage of dedicated and competent personnel for research, including the lack of scientist/researchers/epidemiologists/cepyrs in the field.

#### 5. Lack of research culture

Lack of research culture encompasses a lack of awareness of the importance of research among uplica and polygomeses, lack of research culture in higher elevation institutions, and lack of cohesiveness across government institutions regarding national research priorities. Research is not considered something hat requires priority and other lacks to rejection. Lack of wareness of the importance of research may also lead to a lack of availability of research participants or institutions.

Research is often not associated with incentives, e.g. promotion or salary increment among researchers. While the opportunity to conduct research is limited, researchers may lack interest in some issues, e.g. violence against women.

Opportunities to collaborate with international universities are open. However, poor coordination of health research between stakeholders/institutions, lack of teamwork, and dominance of particular experts also hampers research collaboration.

#### Lack of resources for research

The most common issue related to resource for research is the availability of research lunding (27) and of 30 goals are related to research in https: [27] to a straight of the straight of th

#### 7. The geographical dispersion of islands

The geographical presentation of the country and economic disparity making generalization difficult and increasing the cost of research.

| No | Categories  | Number of relevant<br>responses |
|----|---|---------------------------------|
| 1  | Access to data  | 5                               |
| 2  | Difficulties in getting ethics approval                       | 9                               |
| 3  | Lack of demand for scientific evidence for decision<br>making | 12                              |
| 4  | Lack of competent human resources                             | 29                              |
| 5  | Lack of research culture                                      | 21                              |
| 6  | Lack of resources for research                                | 43                              |
| 7  | The geographical dispersion of islands                        | 3                               |

### Table 15. Barriers and challenges in conducting research

# 11. STRENGTHS AND LIMITATIONS



This study produced a national stakeholder-informed research agenda for health and clinical medicine research. The priorities research list highlights the most important and urgent needs for health research as identified by all stakeholders involved in this study, including clinicians and public health experts.

It is acknowledged that the Display method has been applied in various fields of thusk, such as programs that provide the provide state of the provide state of the state of the Display method in the research privide state provide state advantages a well angre of stateholders in health were represented, used of the privide state may address constraints were represented, used of the advantages a well angre of stateholders in health were represented, used of the privide state may address constraints of the origins, stately and privide state may address constraints of the advantage privide state may address constraints of the origins super privides a balanced constraints of datas. The segmenting tage the balance that the segmention of the state of the state and the state of the super of instance have, built is privide has divided to the state of constraints of the super and metting parality fails that and the access to the super and metting parality fails that and the access to the super and metting parality fails the tage of the super and metting parality fails the tages of the super and metting parality fails the tages of the super and metting parality fails the tages of the super and metting parality fails the tages of the super and metting parality fails the tages of the super and metting parality fails the tages of the super and metting parality fails the tages of the super and metting parality fails the tages of the super and metting parality fails the tages of the super and metting parality fails the tages of the super and metting parality fails the tages of the super and metting parality fails the tages of the super and metting parality fails the tages of the super and metting parality fails the tages of the super and metting parality fails the tages of the super and metting parality fails the tages of the super super tages of the tages of the super super tages of the tages of the super super tages of the super super tages of the tages of the super super tages of the tages

However, it is common in a Delphi survey for participants to drop out in the process. A limited number of experts involved may result in uneven views or uneven spread of expersise. Therefore, we encourage the readers to explore the results from all stages of this research priority setting processes and consider the barriers and challenges in conducting research in Madives.



# **12. NEXT STEPS**

beenhips the top 3D beachin research and circuit research areas uses an initial start in maximizing the beenfiels of research investment, providently valuable direction for the allocation of national and international research. Hurds this areas the analysis interpret can be allocated and international research hurds into areas in command, and polysismeshics. Company the first and if the sectors with the maximum of the allocation of the analysis of the sector of the sectors with the maximum of the allocation of the allocation of the sector of the maximum of the allocation of the allocation of the sector of the maximum of the allocation of the allocation of the allocation of the maximum of the allocation of the allocation of the allocation of the maximum of the allocation of the allocation of the allocation of the maximum of the allocation of the allocation of the allocation of the maximum of the allocation of the allocation of the allocation of the responses on the allocation of the allocation of the priority list to inform research unders may influence that will have all the allocation of the priority list to inform research unders may influence that will have allocation of the all

The impact of this work to the improvement of health research and population health in a long term should be evaluated.

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