Call for proposals

Developing and implementing health systems impact modelling approaches in low- and middle-income countries

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Overview

The Alliance for Health Policy and Systems Research is inviting proposals to develop modelling approaches to measure the impact of health systems interventions on service delivery outputs and health outcomes in selected low- and middle-income countries over a two-year period. Teams from Burkina Faso, Ethiopia, Ghana, India, Indonesia, Kenya, Nigeria, Pakistan, Rwanda and South Africa are eligible to apply.

Background and rationale

Despite an increased recognition of the importance of investing in health systems strengthening, national and global level stakeholders continue to grapple with how to quantify the impact of investments in and reallocation of health system inputs (including human resources for health, financial resources and pharmaceuticals) on improvements in health service delivery, health outputs and outcomes.

The inability to quantify their impact can disincentivize investments in health systems strengthening, especially if they are seen as black box investments with no clear theory of change or ability to measure progress. There is, thus, a need to be able to better measure the impact of investments in health systems interventions on improvements in the delivery of services, health outputs and health outcomes.

Within countries, it is important to enable those working in and advocating for health systems to make the case better within ministries of health and with ministries of finance for investing in health systems and realizing potential efficiency gains that can be achieved from taking a systems perspective. At the global level, being able to clarify the links between investments in health systems and measures of outcome and impact can demonstrate the value of investing in health systems to global health funders, including the major global health initiatives that have historically taken siloed, vertical programme approaches and underappreciated possible gains to efficiency through better integration.

Modelling approaches are one way to make the links more explicit between investments in health-systems-related interventions and desired outputs, outcomes and impact [1-4]. The use of modelling to inform health-related decisions has increased rapidly over the past few years and was noticeable during the COVID-19 pandemic, particularly in informing the design and implementation of public health and social measures [5]. The existing body of literature focused on modelling the impact of health-systems-related interventions on health outcomes is relatively thin. Much of the work is on very narrowly focused interventions, often related to a single disease and a narrow set of health outcomes. A scoping review examining existing modelling approaches for conceptualizing and/or quantifying the impact of health systems interventions identified only a handful of articles that went beyond impacts on a single disease. Notably, the review did not find any articles that described a modelling effort that was integrated as part of a policy- or decision-making process where the findings of the modelling exercise were reported to have impacted policy or practice.

Recognizing the gap in the current knowledge and the practical need for modelling the impacts of health system investments, the Alliance for Health Policy and Systems Research at WHO Headquarters, in collaboration with Health Systems Global with support from the Bill and Melinda Gates Foundation, is

supporting a new programme of research to nurture the development of modelling approaches and techniques to measure the impact of health systems strengthening (HSS) interventions on the provision of essential health services in low- and middle-income countries (LMICs). The programme of work will empower country teams to develop modelling exercises to address policy-relevant questions that are pertinent to their national and local contexts while contributing to the establishment of learning ecosystems of policy-makers, researchers and development partners in that setting. Through demonstrating the practical applicability of modelling and establishment of such learning ecosystems, this programme of work seeks to increase the use of data and modelling approaches in informing health systems resource allocation decisions within the supported countries and demonstrate the utility of this approach to other LMICs.

Objectives

The principal objectives of this work programme are to:

- Co-create and apply health systems modelling approaches to address policy-maker questions related to the impact of health systems interventions on service delivery and health outcomes in selected LMICs;
- Through the process of convening, co-creating and applying modelling approaches, facilitate the establishment of policy ecosystems in supported LMICs where policy-makers are able and motivated to use modelling approaches to inform health system related investments; and
- Utilize modelling approaches to make the case with global health funders, including global health initiatives, for increased investments in health systems strengthening and to design health systems strengthening investments that consider effects beyond single diseases and minimize negative effects on the broader system.

More generally, this programme also aims to:
- Advance the field of health systems modelling and generate new country-level and cross-national knowledge. This includes cross-country lessons on appropriate modelling approaches as well as systematically capturing best practices around the process of conducting the modelling exercises;
- Strengthen in-country capacities for health system modelling through a learning-by-doing approach; and
- Facilitate the establishment and convening of a learning community around health systems modelling within the broader health policy and systems research community.

Definitions, possible approaches and indicative questions

To facilitate a common understanding of this research programme, this section provides **working definitions** of relevant terms, the kinds of **modelling approaches** that could be adopted and examples of the **kinds of questions** that could be feasibly answered through the use of these approaches. The example questions are **only indicative, and teams should not feel restricted to addressing only these questions.** Teams should feel free to propose alternative modelling approaches subject to available capacity to implement these approaches, data availability and feasibility of the approach in terms of financing and available time.

Key definitions
Health systems modelling
In simplest terms, a health systems model estimates the impact of health systems interventions. Health systems interventions are interventions that seek to strengthen health systems building blocks or improve the functioning of a health system. For example, interventions that aim to strengthen the health workforce, increase the availability of supplies and equipment or improve service delivery. Examples of health systems interventions are listed in the next section.

A health systems model should be able to estimate the impact of a health systems intervention in terms of *improvements to service delivery or to population health outcomes*.

Fig. 1: Health systems modelling, for our purposes, should estimate the impact of health systems interventions on service delivery, coverage of interventions or health outcomes. The model should work by first showing the improvement to health systems attributes or functioning.
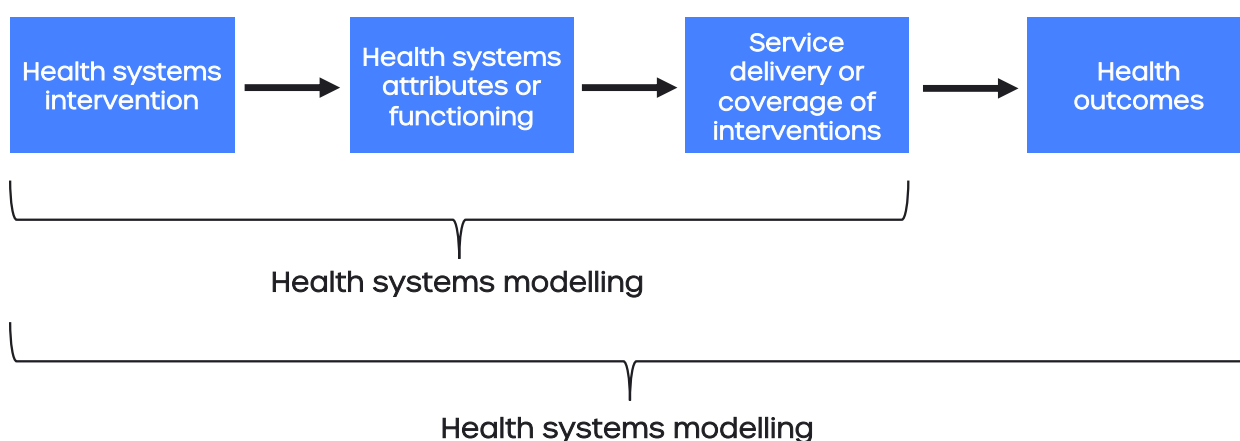
Importantly, the model should be able to capture the effects of health systems interventions *across multiple disease programmes*. Various models exist that can estimate the effect of health systems changes on the incidence or prevalence of a single disease (e.g., models specific to HIV or malaria). Some might consider these to be health systems models, in that they capture the effects of changes to health systems building blocks. For this project, however, a health systems model must capture the horizontal effects of a health systems intervention on service delivery or health outcomes for multiple diseases. The aim is that such a model could be used by a country or donor to estimate the impact of health systems strengthening investments – the sort of investments that would be intended to benefit the health system, beyond one specific disease programme.

Finally, a health systems model should ideally be able to estimate the impact of multiple *different* health systems interventions, including combinations of health systems interventions. Such ability would allow the model to estimate the relative impact of different health systems interventions and to prioritize between them.

Health systems intervention

Health systems interventions aim to improve the functioning of a health system, typically by strengthening one or more of the health systems building blocks, as conceptualized in the WHO Building Blocks Framework [6]. For the purposes of this project, the exact definition of each building block is not important; rather, we use the term generally to mean the different aspects or components of a health system. The ultimate goal of a health systems intervention is an improvement in service delivery and health outcomes. The effects of a health systems intervention are likely to act horizontally, across multiple disease programmes.

The following table lists examples of health systems interventions. They are grouped by building block for convenience. Applicants should feel free to propose other similar interventions.

Building block	Example health systems interventions
Service delivery	• The introduction of a new model of primary care service delivery • Investment in an emergency transportation system to increase referral from primary to tertiary health facilities

Medical products, vaccines, and technologies	• Adoption of new systems for supply chain monitoring and management • Investments in cold chain infrastructure
Information systems	• Upgrading or scaling up of routine health information systems • Introduction of a strategy/activity review cycle process at regional level
Health workforce	• Adoption of new approaches for supportive supervision of health workers • Increased production, deployment or distribution of specific cadres • Roll out of a new model of in-service training or certification • New incentives to improve health worker motivation
Financing	• Adjustment of user fees for select primary care services • Increased support for community-based insurance schemes • Introduction of conditional cash transfers
Leadership and governance	• Changes to the decentralization or centralization of decision-making • Introduction of new management processes or supports

Policy process

The goal of the in-country modelling exercises is to facilitate health systems modelling as part of a policy process. In other words, health systems modelling might inform decision-making in a country as it relates to a policy or set of policies related to health systems strengthening; for example, decisions related to the allocation of resources, or to the development of a strategy. There is no expectation that the modelling exercise itself will decide a policy question. Rather, the aim is that the outputs of the modelling exercise will meaningfully inform an upcoming or ongoing policy question that is of interest to the Ministry of Health at either national or subnational levels.

Possible modelling approaches and overarching questions

A variety of modelling approaches may be employed, including modelling that incorporates one or more of the following: systems dynamic modelling, simulation, discrete-event simulation, agent-based modelling, individual-based modelling, cascade analysis, Tanahashi models, constraint analysis, cost-effectiveness analysis, algebraic or relational models.

Country teams should make use of existing modelling tools or established approaches. The exercises are intended to inform real-world policy. For this reason, the chosen modelling approach(es) should have an established level of trustworthiness in terms of having been previously applied using empirical data.

To meet the abovementioned definition of health systems modelling, the overall model may need to combine or integrate several approaches.

Our preference is for an overall modelling approach that is causal or mechanistic in nature. We favour models that can be explained and understood by policy-makers – in other words, not a black box. The model should be an articulation of how a health system functions, with pathways that are explicit. Empirical or predictive models (e.g., regression analysis) might be used as part of a larger approach, but models that rely entirely on an estimated association between a health systems intervention and a health outcome will not be sufficient to show intermediate effects on health systems building blocks and will therefore limit the ability of policy-makers to understand, interrogate and interpret the model.

Ideally, the modelling approach should allow for extensibility, with the ability to add new parameters/pathways to the model in future efforts.

Finally, the modelling approach should strike the right balance of complexity – capturing sufficient detail for it to be considered a health systems model, while also allowing policy-makers to understand and interpret the model and trust its results.

Modelling exercises should answer one of two related overarching questions:
1. If a country or subnational entity were to implement [health systems intervention X], what would be the impact on [service delivery or health outcome Y]?
2. To achieve a target level of [service delivery or health outcome], which health systems interventions should a country prioritize?

Example research questions
More concrete examples of research questions that address the overarching questions might include:
- If a country rolled out a new in-service training package for nurses and midwives, what would be the resulting increase in effective coverage of antenatal, childbirth and postnatal services?
- If a country introduced a new supply chain management system to reduce stock-outs at district level, what impact would be seen on the coverage of health interventions for a select set of communicable and noncommunicable diseases?
- What impact would a proposed new model of service delivery have on under-5 child mortality if it were to be scaled up nationally?

- To achieve at least 80% coverage of a package of 20 primary health care interventions, what improvements are needed in health systems functioning for each of the health systems building blocks?
- Which of three proposed health systems strengthening investments is likely to have the biggest impact towards achieving universal health coverage?

Please note that these are only examples and teams are not limited to selecting from these specific questions.

Eligibility and selection criteria

To be **eligible** for funding the:
- The **principal investigator** must be based in a research/academic institution in one of the countries eligible for this call for proposals. These countries are: **Burkina Faso, Ethiopia, Ghana, India, Indonesia, Kenya, Nigeria, Pakistan, Rwanda and South Africa.**
- The team must include at **least one policy-maker** currently working in the health system at the national or subnational level whose role must be clearly identified in the proposal.
- **50% of the core research team** must comprise female researchers.
- The proposal must put forth a **modelling approach** that makes the link between a health systems intervention and service delivery related outputs and/or health outcomes towards addressing one of the two **overarching questions** outlined above.

Selection of studies to fund will be done by at least two external reviewers and adjudicated by the Alliance Scientific and Technical Advisory Committee based on **criteria** including:
- Demonstrable alignment with a policy process/impending policy process;
- Experience of the research team in engaging policy-makers in research processes;
- The policy relevance of the chosen research question and the potential policy applicability of answers to this research question;
- The potential of the research question to be feasibly modelled within the programme timeframe;
- Availability of data to answer the identified research question;
- The clarity of the proposed modelling approach, as articulated in text and through a schematic diagram or visualization;
- Capacity of the research team to implement the proposed modelling approach;
- A clearly articulated overview of the process through which the team plans to implement this work programme from inception to dissemination; and
- Value for money.

Consideration will also be given to ensuring diversity in countries covered. Shortlisted teams will be invited to a phone interview with the Alliance Secretariat prior to final selection.

Budget, duration of work and process

A maximum of three proposals will be supported for funding under this research programme. The maximum funding for a given proposal will be **US$ 160 000 for a period from October 2024 to September 2026.** This includes the cost of meetings of the in-country consortia and the development of dissemination products for policy-maker audiences in-country (such as technical briefs). However, it does not include costs of publication of peer-reviewed journal articles nor the costs of travel of Alliance participants to the in-country consortium meetings. The Alliance will separately support these activities.

Following selection, the Alliance will engage closely with the research teams to identify a consortium of country-based stakeholders including policy-makers, academic experts in health systems and modelling and development partners to serve as an advisory and feedback body to inform this programme of work.

In parallel to this, and based on the proposal, the Alliance will engage with the selected research teams to develop full protocols. **Research teams should be aware that there may be significant changes to what they have initially proposed based on data availability, methodological feasibility and time constraints.**

The protocol will be presented at an **initial in-person meeting** of the **country consortium** to be held between January and March 2025. In addition to getting feedback on the overall feasibility of the work programme, this meeting will gauge the resonance of the proposed question and approach with policy-makers towards generating national-level buy-in. Informed by feedback from the consortium, the protocol will be finalized.

The **modelling approach** will be developed during the course of 2025 and early 2026. **Technical support** will be provided through regular check-ins from the Alliance and **cross-team learning** encouraged through engagement with other country research teams. Another meeting of each country-level consortium in **early 2026** will serve to debrief on the findings of the modelling exercises and refine them further. The emphasis from **mid-2026** will be on advocating with national stakeholders for the uptake of the findings, the development of national and/or subnational learning ecosystems, synthesizing lessons across the three country cases, and engaging with global health initiatives to identify how best to use these findings to inform their work.

Expected outputs and outcomes

In terms of outputs, teams supported by this programme are expected to use health systems modelling to address a question raised by policy-makers within their own setting. The results of this modelling exercise would be demonstrated through technical briefs and one or two peer-reviewed publications.

Given the programme's overall objectives, success will be judged in terms of the extent to which:

1. the research team puts in place an inclusive process to develop and implement the modelling approach that brings together the full range of relevant stakeholders at national and/or subnational levels; and
2. the project advances the establishment of learning ecosystems that, over time, routinize the use of modelling approaches and data more broadly to inform health systems policy and practice.

Application process

Deadline: 15 August 2024, 23:59 CEST

Proposals submitted after this deadline will not be considered.

Successful applicants can be expected to be notified within six weeks of the deadline. WHO may, at its own discretion, extend this closing date for the submission of bids by notifying all applicants thereof in writing.

Submissions of proposals should be made to alliancehpsr@who.int. Please use the subject: WHO Bid Ref. Call for proposals: Health systems impact modelling.

Submissions of <u>no more than **eight pages (1.15 spaced, using a standard font sized 11, and using regular margins)**</u> should include the following sections and content:

1. Name and **contact details** the key contact person and lead institution.
2. **Composition of the research team** including the position and qualifications of the Principal Investigator(s) and other team members. The description of the team should clearly provide information around a) team member's capacity and experience in modelling particularly health systems modelling, b) engagement in health systems research, c) engagement with policy-makers in evidence to policy processes. The team as a whole must demonstrate expertise in these three areas.

This section must also provide information on the gender breakdown of the core research team and **indicate which team member is a policy-maker with decision-making authority at national or sub-national level.** Recognizing the diverse range of skills required to effectively implement this work programme, up to **three individuals** may be named co-PI.

Collaboration across institutions is encouraged particularly with other institutions within the same country or in other LMICs. Teams may choose to collaborate with institutions in high-income countries on the understanding that the Alliance will develop a contract with only one institution and that institution must be based in the country where the modelling exercise is proposed to be carried out.

3. **Technical proposal** that includes the following elements:
    a. A **clear research question** that uses health system modelling approaches to examine the impact of health-system-related interventions on one or more measures related to the delivery of services, health system related outputs or health impact. This question should meet the following criteria: a) be a question of interest to one or more policy-makers with decision-making power at the national or subnational level, b) the answer to this question must have the potential to directly inform an ongoing or impending policy change, c) be feasibly answered using existing data sources and modelling approaches and within the project timelines.
    b. Explanation of **why the proposed question is important** and relevant to the national or subnational level health system being examined and the precise **nature of the policy process and ongoing/impending policy change** that it can potentially inform.
    c. Outline **available data sources** that the research team plans to use to develop the modelling approach. Research teams are encouraged to examine a wide range of data sources at the level of individuals, facilities and geographical units. They should consider the use of both survey data as well as data available from health facility assessments, or through the health management information system as well as private actors. Given the available timelines for this research, supported teams are not expected to conduct largescale surveys for the collection of primary data.
    d. Provide **information on the modelling approach(es)** that the research team will use to estimate the impact of health-system-related interventions on output, outcome and/or impact measures. Teams may propose more than one approach to address a given policy-relevant question.

e. Illustrate the modelling approach with a **schematic diagram** or visualization that shows the links between the health system interventions and the chosen measures or impact. The aim of this visualization is to better understand how the model estimates the impact of the health system interventions on intermediate and ultimate outcomes – for example, on health systems functioning, service delivery and population health outcomes.

f. Provide an **overview of the process** through which the team plans to implement this work programme from inception to dissemination of results. This section must explain in detail the proposed approach to engaging policy-makers and other relevant stakeholders at each stage of the work programme.

g. Discuss **anticipated challenges in terms of data availability, capacity and policy-maker engagement** in this process and provide information on how the team plans to mitigate these. Teams should also use this section to provide **evidence of previous experiences of engaging policy-makers within research processes**

4. Provide an **itemized budget** for activities over the period from October 2024 to September 2026. Please also provide a **summary budget** of the total costs broken down by the following categories (not all may be applicable): personnel, supplies/facilities, equipment, communications, travel and per diem, and others (meetings, production of dissemination products etc.). **Given the duration of this grant, applying teams should note that extensions beyond September 2026 will not be possible. Overhead costs should be a maximum of 10% of the total budget.**

In annex (and not included in the page count), teams must submit CVs of a) the Principal Investigator, b) any other individuals named as co-Principal Investigators, c) policy-maker member of the core research team. The CV of at least one of the researchers must demonstrate publications related to modelling.
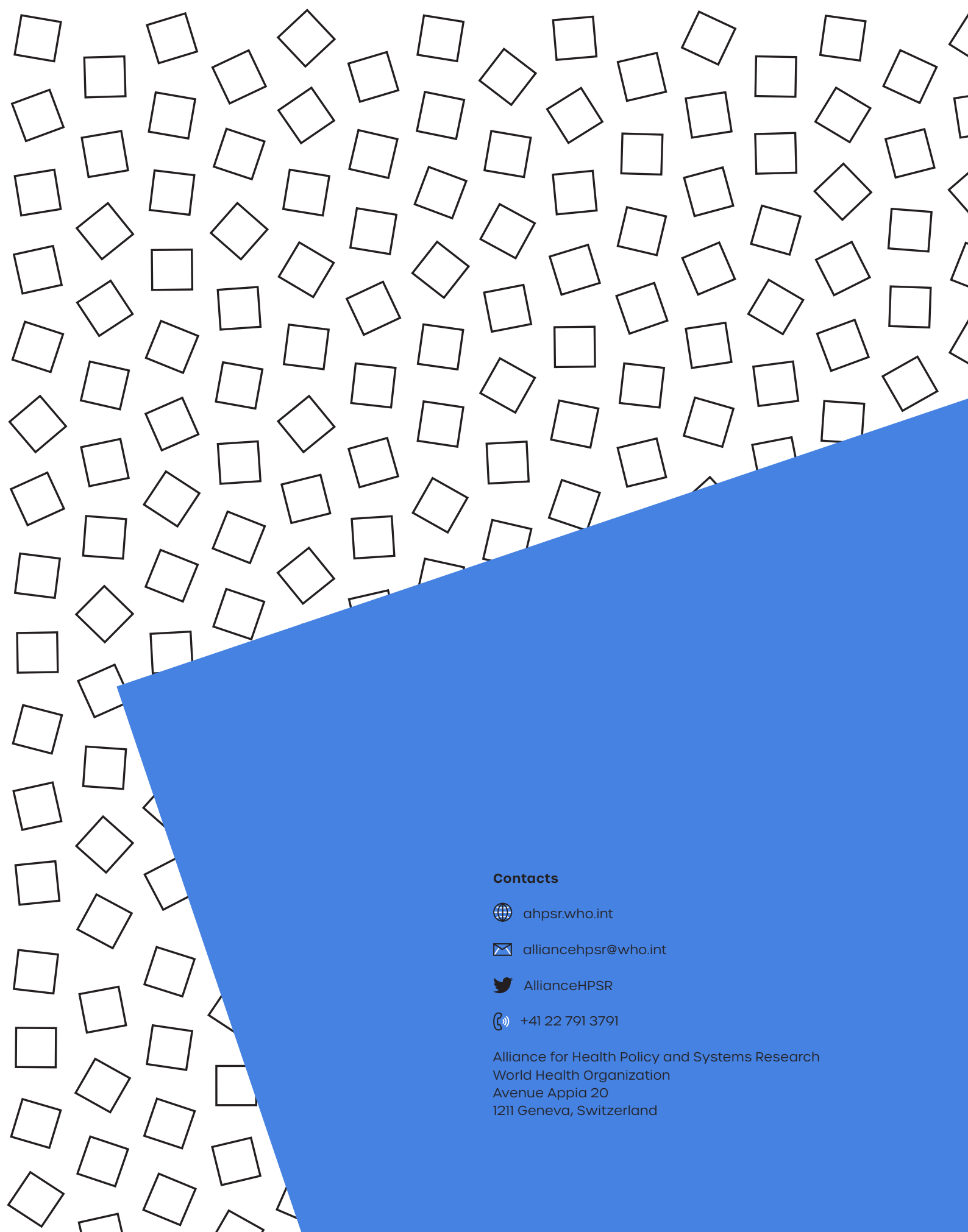
Notes for applicants

1. WHO may, at any time before the closing date, for any reason, whether on its own initiative or in response to a clarification requested by a (prospective) applicant, modify the bid by written amendment. Amendments could, inter alia, include modification of the project scope or requirements, the project timeline expectations and/or extension of the closing date for submission.

2. All prospective applicants that have submitted a bid will be notified in writing of all amendments to the bid and will, where applicable, be invited to amend their submission accordingly.

3. Applicants should note that WHO reserves the right to:
   a. Award the contract to a bidder of its choice, even if its proposal is not the lowest;
   b. Award separate contracts for parts of the work, components or items, to one or more bidders of its choice, even if their proposals are not the lowest;
   c. Accept or reject any proposal, and to annul the solicitation process and reject all proposals at any time prior to award of contract, without thereby incurring any liability to the affected bidder or bidders and without any obligation to inform the affected bidder or bidders of the grounds for WHO's action;
   d. Award the contract on the basis of the Organization's particular objectives to a bidder whose proposal is considered to be the most responsive to the needs of the Organization and the activity concerned;
   e. Not award any contract at all.

4. WHO has the right to eliminate bids for technical or other reasons throughout the evaluation/selection process. WHO shall not in any way be obliged to reveal, or discuss with any bidder, how a proposal was assessed, or to provide any other information relating to the evaluation/selection process or to state the reasons for elimination to any bidder.

5. WHO is acting in good faith by issuing this RFP. However, this document does not oblige WHO to contract for the performance of any work, nor for the supply of any products or services.

6. WHO also reserves the right to enter into negotiations with one or more bidders of its choice, including but not limited to negotiation of the terms of the proposal(s), the price quoted in such proposal(s) and/or the deletion of certain parts of the work, components or items called for under this RFP.

7. Within 30 days of receipt of the contract, the successful bidder shall sign and date the contract and return it to WHO according to the instructions provided at that time. If the bidder does not accept the contract terms without changes, then WHO has the right not to

proceed with the selected bidder and instead contract with another bidder of its choice.

8. WHO reserves the right, subject to considerations of confidentiality, to acknowledge the existence of the Contract to the public and publish and/or otherwise publicly disclose the Contractor's name and country of incorporation, general information with respect to the work described herein and the Contract value. Such disclosure will be made in accordance with WHO's Information Disclosure Policy and shall be consistent with the terms of the Contract.

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