Appendix 1

Methods

Contents

1. Study design and approach

This study adopts a cross-sectional, mixed-methods approach, drawing from a range of data sources and data collection methods, including a global and regional level analysis as well as three embedded country case studies. The overall approach was tailored to the research questions, and also to the rapid nature of the research mandate while ensuring the production of rigorous findings through careful triangulation and comparison, as well as expert validation.

Country case studies included Pakistan, South Africa and Senegal, and were selected based on offering a range of regional settings, having a variety of relationships with the focal GHIs and having strong academic partners based in them.

As described in more detail in the sections below, data collection draws from a rapid scoping review of the published and unpublished literature, analysis of burden of disease and health financing trends, a series of interviews and consultations at global, regional and country levels, and an online survey. Data analysis was carried out separately for each of the data sources and then findings were triangulated and compared to draw higher-level conclusions on which recommendations and vision were built. Across all qualitative data analysis and critically when bringing together all findings, a political economy lens was adopted, which informed our thinking and approach to the analysis of the challenges and the proposed vision, including the management of change (further details are presented below).

A strength of our overall approach is the collaboration across five universities across the globe in Africa, Asia and Europe and across disciplines including medically-trained researchers, sociologists, economists, anthropologists, political scientists, public health and health system experts. Expertise, views and perspectives were shared not only for data analysis but at all stages of the research process including proposal writing, research protocol development and data collection tools development.

2. Data sources and data collection methods

2.1. Rapid scoping review

A rapid scoping review (1) of peer-reviewed literature and grey literature was conducted to inform the qualitative research tools and scope, and to identify any gaps in the existing evidence on GHIs. This type of review was chosen due to the exploratory nature and restricted timeframe of the study. Specific research questions for the scoping review were: What are the strengths and weaknesses of GHIs? What recommendations for change to the global health ecosystem have been proposed? What factors (considering the political economy) hinder or enable change?

Data search

Ovid MEDLINE, Google and all the six GHIs websites were searched in February 2023 using the following terms: "global health initiative*" "global fund to fight" "global alliance for vaccines and

immunization" “gavi” "global financing facility" ”unitaid” "foundation for innovative new diagnostics" "global alliance for diagnostics" "coalition for epidemic preparedness innovations" using OR as the Boolean expression, published between since 2013-February 10th 2023 (past 10 years). Additionally, the scoping review was updated with further literature and documents that were shared with the team by key informants in June 2023.

Inclusion criteria and document selection

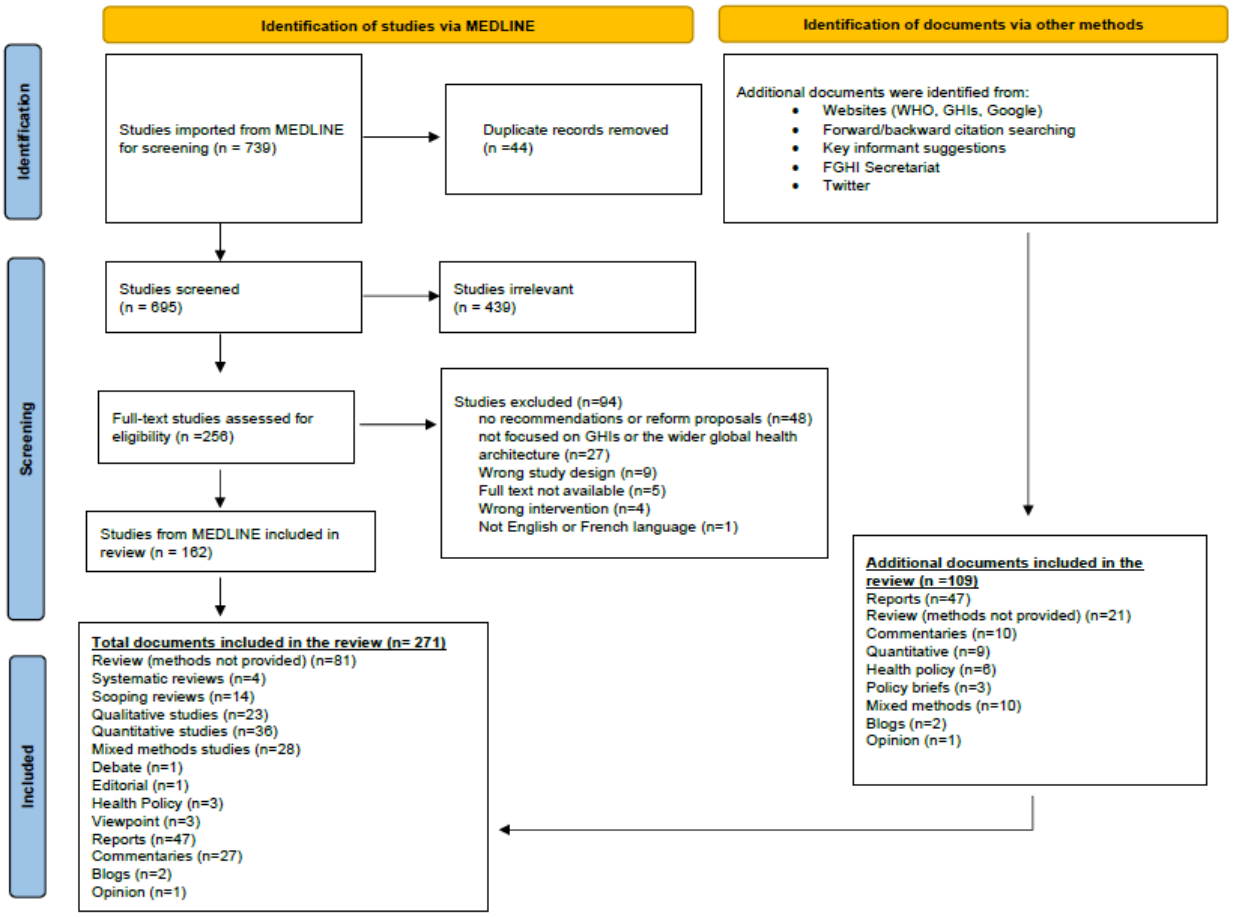
The inclusion criteria were: papers published in the past 10 years; full-text accessible online, written in English or French; having a focus on GHIs; and having recommendations for the evolution of GHIs. The retrieved articles were title and abstract screened and doubly full-text screened. The following elements were extracted from the included articles: bibliographic details, strengths, challenges and adverse effects relating to GHIs, recommendations proposed to strengthen GHIs and the wider global health ecosystems, previous GHI reforms, and the factors influencing their success (or lack thereof). In addition, separate document reviews were conducted in each of the case study countries to complement the documentation at global level with country level information, and in particular documents of previous GHI evaluations, and GHI and government strategic plans.

Results

The MEDLINE search returned 790 articles. Of these, 162 were included. An additional 62 documents from website searches, forward/backward reference list searching, and suggestions from key informants (i.e. FGHI Steering Group, Research Learning and Task Team, and key informant interview participants) were included. A further 47 documents (n=25 reports, n=20 articles, and n=2 policy briefs) were included to inform the updated review.

A total of 271 documents were included in the review (Figure 1). The years of publication ranged from 2008 to 2023. Most papers were focused on the wider global health architecture. However, there were a number of GHI-specific papers: Gavi n=30; GFATM n=32; Unitaid n=2 ; GFF n=6; CEPI n=2; and Gavi and GFATM n=2. There were 16 country case studies, while the rest (n=255) had a global or regional focus.

Figure 1 PRISMA Chart



2.2. Burden of disease and health financing trends desk review

To address the research question, 'do health financing trends align with the burden of disease (BoD)?', secondary data analyses were performed. Data on current and future BoD was extracted from two main sources: the WHO Global Health Observatory and the Institute for Health Metrics and Evaluation (IHME) Global Burden of Disease Foresight Visualization (2), respectively. In addition, health financing data was extracted from IHME (3), OECD Development Assistance Committee (DAC) Creditor Reporting System (CRS) (4), and the WHO's 2022 (April 2023 update) Global Health Expenditure Database (GHED) report. Peer-reviewed articles were also used (5) (6) (7).

The country case studies used the same data sources, but in addition, national repositories, peer-reviewed journal articles and government reports were consulted to inform national burden of disease analyses.

2.3. Key informant interviews

Global level

A range of key informants from bilateral, multilateral, CSO, private sector, and academic informants was purposefully selected, based on their experience and expertise regarding the GHIs of focus. An initial list of contacts was provided by Wellcome, the FGHI secretariat, Research Learning and Task Team and Steering Group, which was complemented with the research team's professional connections, in addition to recommendations from other interviewees. Key informant interviews (KIIs) were conducted by the QMU and UNIGE research teams via Zoom or in-person. The interviews lasted between 40 and 60 minutes. A semi-structured question guide (Appendix 2) was used. The questions addressed the current state and future of the GHIs, including through a political economy lens. A total of 77 global-level KIIs were conducted (Table 1), 15 of which were FGHI Steering Group members. The methods used for the global KIIs are presented in more detail in Appendix 6.

Table 1 Global-level key informant interview demographics

Type of informant	Number of interviews	Gender
Global Health Initiative	18	11M, 7F
Academic / Policy Analyst	11	7M , 4F
Multilateral Donor	16	9M, 7F
Bilateral Donor	15	7M, 8F,
Civil Society Organization	10	4M, 6F
Private Sector	4	4M
Foundation	2	1M, 2F
GRAND TOTAL:	**77**	**43M (57%), 33F (44%)**

Country-level Key Informant Interviews

Interviews at country level took place between February and June 2023. Each country team identified key informants relevant for their specific settings and also adopted a snowball technique to add to the initial list new informants based on suggestions of others during interviews. Interviews were carried out both in-person and online. The topic guides can be found in Appendix 2. A total of 66 KIIs were done across the three case studies (Table 2).

Table 2 Country case study key informant interview demographics

Country	Number of interviews	Category of informant
Senegal	25	Implementation partners (n=4), CSOs (n=4), Government (n=9), Technical/Financial partners (n=6), Academic (n=1), Private sector (n=1)
Pakistan	17	National and provincial government health departments (n=4), National and provincial disease programmes (n=4), Multilateral (n=3), NGOs (n=2), Experts (n=2), Technical assistance provider (n=1), Planning and economic affairs (n=1)
South Africa	24	Government (n=9), Academic (n=7), CSO (n=4), Research institution (n=2), Regional organisation with South African footprint (n=2)
GRAND TOTAL:	66	

2.4. Regional consultations

Multi-stakeholder consultations were held to complement the study findings and gain diverse regional perspectives on challenges and opportunities for change regarding GHIs and the broader global health system. Participants for these consultations were recruited through multiple avenues: suggestions from the FGHI Secretariat and members, The Wellcome Trust, key informants who had been interviewed to inform the global or country-level case studies, and through purposeful searches of websites and literature. Unique semi-structured interview guides were developed for each consultation, and questions were based on findings from the literature and the global and country-level key informant interviews. Each consultation followed a slightly different approach, based on participant availability and type of expertise. Some consultations were carried out using individual interviews (e.g. EURO, WPRO, West Africa), to reach more informants (who were either unavailable or unwilling to participate in a group consultation). In total 77 participants were involved in the consultations (Table 3). Participants could respond verbally, and/or using the chat function. The consultations were recorded, transcribed, and analysed.

Product Development Partnership consultation

On May 5th, 2023, one-and-a-half-hour virtual consultation was held with the product development partnership (PDP) coalition. PDP is an informal group of 15 members, chaired by FIND and the TBAlliance, who meet regularly to coordinate. This was a suggestion from the FGHI Secretariat as they were already in communication with the PDP Coalition. All members were invited. There were six participants that attended the consultation, representing four PDPs.

The focus of the consultation was to gain expert insights from the PDP Coalition members about their past and current experience (challenges and strengths) of their experience with the GHIs (particularly the market shapers), and their desired future evolution of the GHIs. A list of open-ended questions were shared with the invitees in advance of the call and during the call (on slides). The questions involved the current state, their desired vision for the future, and levers for change.

Table 3 Overview of the multi-stakeholder consultations

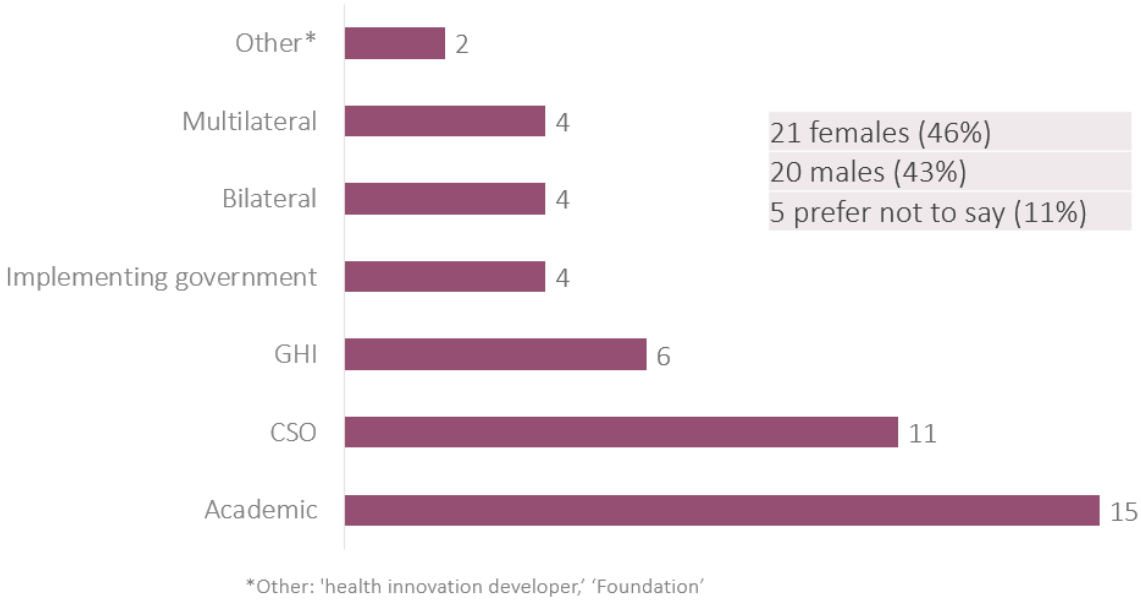
WHO Regions	Number of participants (n=)	Type of participant	Countries represented	Type of consultation	Research consortium team responsible
AFRO (West)	17	Multilateral and regional technical and financial partners (n=10); Implementation partners (n=3) CSO (n=3) Academics (n=1)	Benin, Burkina Faso, Côte d'Ivoire, Mali, Niger, Senegal	Individual key informant interviews via Zoom (between 1 and 1.5 hours each)	Université Cheikh Anta Diop de Dakar
AFRO (Southern and Eastern)	16	Recipient governments (n=7) Academics (n=4) Multilateral (n=3) NGO (n=2)	Egypt, Eswatini, Ethiopia, Kenya, Malawi, Uganda, Zambia	1.5 hour virtual multi-stakeholder consultation via Zoom and nine individual key informant interviews	Stellenbosch University, South Africa
EMRO	10	WHO EMRO/multilateral (n=5) WHO country office (n=1) Recipient governments (n= 3) NGO/CSO (n=1)	Afghanistan, Somalia, Sudan, Syria	1.5 hour virtual multi-stakeholder consultation via Zoom and individual key informant interviews	Aga Khan University, Pakistan
SEARO	11	Multilateral (n=1) Recipient governments (n= 1) Academics (n=3) NGO/CSO (n=6)	Bangladesh, India, Nepal, Sri Lanka, Indonesia, Bhutan	1.5 hour virtual multi-stakeholder consultation via Zoom and individual key informant interviews	Aga Khan University, Pakistan
EURO	2	WHO country office (n=2)	Azerbaijan, Tajikistan	Individual 1 hour key informant interviews	University of Geneva, Switzerland
WPRO	2	CSO (n=1) Government (n=1)	Philippines, Papua New Guinea,	Individual key informant interviews	University of Geneva, Switzerland
PAHO	19	Recipient governments (n=5) CSOs (n=10) Academics (n=3) Multilateral (n=1)	Colombia, Costa Rica, Haiti, Mexico, Peru	1.5 hour virtual multi-stakeholder consultation via Zoom	University of Geneva, Switzerland

Total number of regional participants	77				
Additional Consultation					
PDP Coalition	6	Product development partnership members	N/A	1.5 hour virtual consultation via Zoom	

2.5. Online survey

An online survey was circulated between May 19th and June 9th 2023. The rationale for having an online survey was to reach additional key informants (that were either unavailable or unwilling to partake in an interview or consultation). The survey was purposefully circulated by the research consortium, The Wellcome Trust, and FGHI Secretariat to global health experts. It was also shared with key informants who declined to be interviewed and those who had participated in a consultation to provide them an opportunity to input more detailed information and resources. The survey contained 13 questions, including three questions on background demographics (category of respondent, gender, and country of origin), one multiple choice question and seven open questions. The full list of survey questions can be found in Appendix 3. The questions included: what changes are most needed, strengths and achievements of GHIs, how GHIs can support HSS and UHC, incentives to change, monitoring and evaluation mechanisms and indicators of success. There were a total of 46 responses received (Figure 2) from 20 different countries[1].

Table 2 Online survey responses by category of respondent



[1] Argentina, Bangladesh, Botswana, Brazil, France, Georgia, Germany, Ghana, Japan, Mali, Netherlands, Nigeria, Norway, Oman, South Africa, Chad, Thailand, United Kingdom, United States of America, Zimbabwe

2.6. Consultative Meetings

In addition to the regional consultations, two consultative meetings were held (Table 4). Preliminary findings from the synthetic analysis were presented on two occasions (summary of participants provided below). During both meetings, the findings at global and country level and an overview of the recommendations and vision were presented, and high-level participants had the opportunity to provide further feedback, views and suggestions, to strengthen the results and inform on the final stages of the research.

2.6.1. Addis hybrid deliberative discussion

On June 14th, 2023, a hybrid deliberative discussion was held at the African Union Commission, co-hosted by the Africa Centres for Disease Control and Prevention (CDC). There were 29 in-person participants. There were nine ministries of health, representing eight countries in Africa (Central African Republic, Ghana, Guinea-Bissau, Ethiopia, Malawi, Somalia, Tanzania, Uganda and Kenya). Two donors were present (UK Foreign, Commonwealth and Development Office and Norwegian Ministry of Foreign Affairs). There were a further 16 online participants (excluding FGHI secretariat and research consortium members), from multilateral and civil society organisations, and two foundations.

2.6.2. FGHI Steering Group Virtual Meeting

On June 22nd, 2023, a virtual consultation was held via Zoom with the FGHI Steering Group members. Fifty-six people were on the call, 13 of which were SG members (or appointed representatives of the SG members unable to attend). Key study findings and a revised draft vision and recommendations were presented. The SG members were given the opportunity to provide their feedback and suggestions on the presentations and final stages of the research.

2.6.3. Research Learning and Task Team Meeting

This online meeting took place on July 17th. All members of the Research Learning and Task Team (RLTT) were invited. Professor Karl Blanchet presented the study methods, findings, and recommendations for 40 minutes, followed by 20 minutes of questions and feedback from the audience. The feedback was noted by the research consortium and addressed where feasible.

Table 4 Overview of the consultative meetings

Meeting	Date	Number of participants	Type of participant	Recipient government representation	Type of meeting
Hybrid Deliberative Discussion co-hosted by the Africa CDC	June 17th, 2023	29 in-person 16 online (via Zoom)	In-person: Recipient governments (n=9), FGHI secretariat (n=2), FGHI co-chairs* (n=2), Wellcome Trust (n=2), CSOs (n=5), Multilaterals, (n=3), Regional organizations (n=3), Africa CDC (n=3), bilateral donor (n=2) Online: CSOs (n=2), Product development partnership (n=1), Recipient governments (n=2), Foundation (n=3), Wellcome secretariat (n=2), Bilateral (n=2), Independent global health consultant from the African continent (n=1), Multilateral (n=1), Academic (n=1), African Union (n=1) *co-chairs were counted in both their roles	Central African Republic, Ethiopia, Ghana, Guinea-Bissau, Malawi, Somalia, Tanzania, Uganda	Full day in-person (African Union Commission) and online via Zoom
FGHI Steering Group	June 22nd, 2023	22 (excluding research team members/ FGHI Secretariat)	Multilateral (n=2), Recipient governments (n=3), CSOs (n=2), Bilateral donors (n=8), Foundation (n=2), Wellcome Trust (n=3), FGHI co-chairs (n=1), FGHI secretariat (n=1) Of these, 12 were FGHI steering group members/assigned members	Ghana, Indonesia	2-hour virtual multi-stakeholder consultation via Zoom
RLTT Members	July 17th, 2023	43 (excluding research team members/ FGHI Secretariat)	Academic (n=6), Bilateral (n=8), Multilateral (n=9), CSO (n=4), GHI (n=4), Wellcome Trust (n=3), Foundation (n=1), Recipient Government (n=1)	Democratic Republic of the Congo	1.5-hour call via MS Teams

3. Approach to data analysis and synthesis

3.1. Overall conceptual framework: a political economy lens

A political economy lens was adopted for the analysis throughout the work. Political economy analysis (PEA) aims to explain the interactions of political and economic processes in a society in general or in relation to a specific issue (i.e. problem-driven PEA). In its essence, PEA involves looking at the dynamic interaction between structures, institutions and stakeholders to understand how decisions are made (8) (9). In particular, PEA is used to assess the power, position and interest of key political actors (stakeholders) as well as the incentives they face in a given (structural) context and the formal and informal institutions through which they interact, in order to understand their behaviour (in a retrospective or cross-sectional way), but also to develop strategies to change the political feasibility of desired changes.

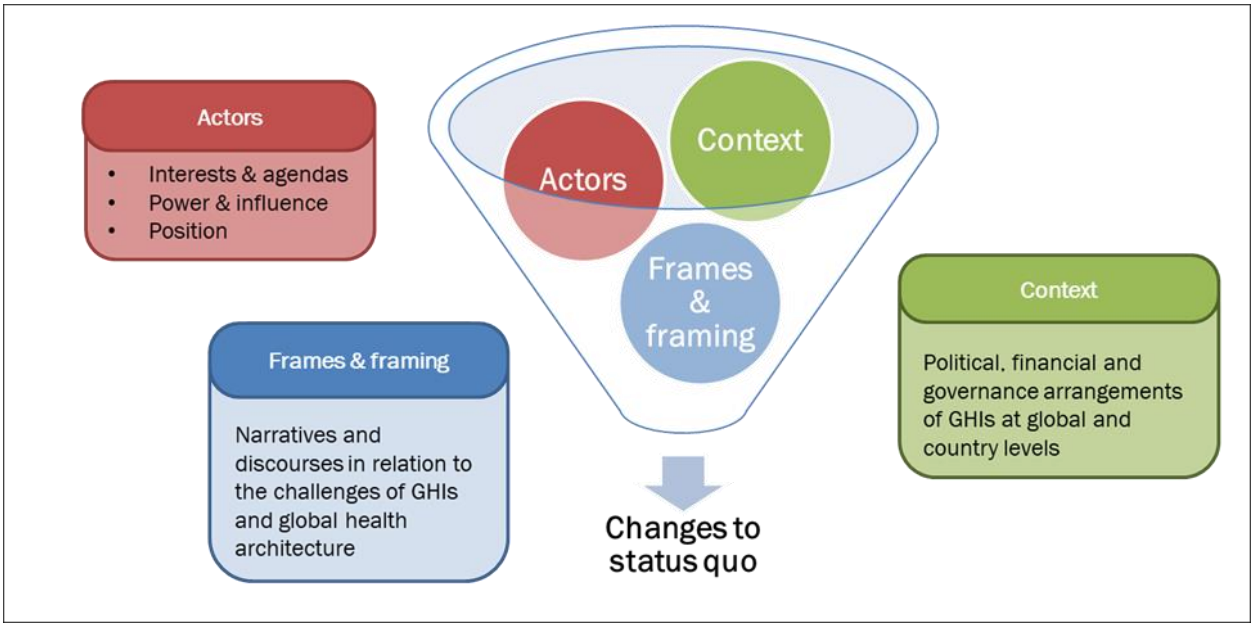
For this assignment, a political economy lens was deemed suitable not only to analyse and understand the dynamic interactions between actors (their relative power and respective agendas) and context, globally and in the selected country case studies, but also to inform the vision for GHIs and to reflect on politically-savvy approaches to change management (10) (11).

Building on existing literature, we identified three key elements to be considered across the data analysis for all data sources and components, and for the synthesis work: actors, context and frames/framing (Figure 3).

- **Actors**: a detailed analysis of the stakeholders was carried out in each country and at global level to understand the power as well as the interests and position of actors involved. We broadly adopted the approach recently delineated (12) and identified as domains for the stakeholder analysis (i) position (whether the stakeholder supports, opposes or is neutral about changes to status quo on GHIs or not), (ii) interest (stakeholder's motivations and perceived impact of changes to status quo to their own organisation), and (iii) power and influence (the potential ability of the stakeholder to affect implementation of changes to status quo/reforms). The stakeholder analysis was informed by peer-reviewed guidance (13) (14).
- **Context**: through document review, interviews and consultations we collected and analyzed rich information concerning the historical, political, financial, and governance context(s) in which the stakeholders operate and how it can constrain or support change. We reflected for example on the expected changes to the landscape in terms of funding, geo-political and strategic priorities in the global health system.
- **Framing**: Building on recent literature (15) which acknowledges the critical influence of frames and framing in policy processes, we will as much as possible also explore the role and power of narratives and discourses, and how they shape the debate around GHIs.

The common code tree and PEA framework adopted in the analysis for all qualitative components allowed us to bring together the different findings, triangulating, comparing and contrasting results under each of these broad elements, and leading to the final synthesis report. While the synthetic work does not present a separate analysis of each of these elements in turn (with the exception of a detailed reflection on power, interest and influence - see section 5 of the study report), the three elements of the PEA framework and the analysis of their dynamic interactions in relation to the status quo (and its challenges) and the future vision were explicitly used in the analysis of each data source. Political economy considerations remain central in the final report and cut across the entire analysis, which goes well beyond the technical elements of the analysis to consider the political economy dynamics.

Figure 3 Political economy framework guiding the qualitative analysis and synthesis



Source: Adapted from Bertone et al (2018)(16)

3.2. Qualitative data transcription and coding

All audio recordings (KIIs and consultations) were transcribed verbatim and analysed by a team of qualitative researchers.

The interview and consultation transcripts underwent thematic analysis (17) conducted by trained qualitative researchers using the NVivo software package and a coding book (reflecting the themes of the topic guide, but also the key elements of the overarching conceptual framework based on PEA). The analysis process involved several steps. Initially, the researchers read a subset of the transcripts to gain familiarity with the information provided. Subsequently, they conducted open coding on a sample of transcripts and collaboratively refined a coding framework, which was developed in partnership with the research consortium. Following the establishment of the coding framework, all transcripts were independently coded by the researchers. The coded transcripts then underwent a

review process within the research group, during which emerging themes and sub-themes were identified through an iterative approach. The researchers convened to discuss the emerging findings, and in some cases, conducted case-sensitive analysis to examine similarities and differences among GHIs and across participant categories. The codes were subsequently merged to facilitate comparisons across themes and to identify any gaps in the data.

4. Ethical considerations

Ethics approval was granted by four of the five universities involved in this study: University of Geneva (CUREG-2023-02-19), Stellenbosch University (South Africa) (N23/03/014), Aga Khan University (057-ERC-SSHA-2023), and Cheikh Anta Diop University (CNERS: n° 00000179 MSAS/CNERS/SP). Informed consent for audio recording and publishing of pseudo-anonymised data was obtained from all key informants before beginning each interview and consultation.

In order to maintain their anonymity, interviewees who are quoted were not described by their name, demographic information or specific organisational affiliation to prevent them from being identified. Several interviewees did not want to be directly cited and others requested that specific examples they gave during interviews not to be directly referenced. In order to balance the ethical need to protect the anonymity of participants with academic rigour and allow deeper interpretation of the data, findings are linked to specific groups (GHIs, academic/policy analysts, CSOs, private sector, foundations, bilaterals, and multilaterals) rather than to individuals.

5. Study Limitations

While we adopted a strong methodological approach as detailed above to ensure the rigour of our findings and limit bias and limitations, we acknowledge that some issues have affected our study. In particular:

- the rapid timeline for the study limited the amount of data collected and the depth of the analysis
- emphasis was placed on country voices, especially from governments. Other actors might be under-represented
- difficulties in identifying and scheduling interviews with certain actors, especially representatives of GHIs (both at global and country-level)
- difficult to obtain country data on GHI and domestic financing trends
- anonymity/requests to not cite directly some of our respondents means we cannot attribute all findings to specific individuals or institutions.

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