Healthy People, Healthy Societies: An Integrated Approach

Results from the LERU-EGHRIN Town Hall meeting on Global Health, June 2022.

1. Summary

The League of European Research Universities ([LERU](#)) and the European Global Health Research Institutes Network ([EGHRIN](#)) aimed to identify actions to support Global Health research in a Town Hall Meeting on Global Health entitled: *Healthy people, healthy societies: an integrated approach.* The meeting was held in Barcelona in June 2022. The aim of this meeting was to address current Global Health themes from different disciplinary perspectives, to discuss research gaps and to propose how academia can address them to advance towards a European research agenda.

Four topics were addressed at the meeting. Each began with a keynote speech, then was followed by a panel discussion and a breakout sessions.

Themes	Subthemes
Healthy and sustainable societies	- Health promotion and prevention for non-communicable diseases and mental health; - Strategies against poverty-related diseases; - Preparedness for, and response to, health emergencies and pandemics, health systems and societal resilience; - Health in relation to the environment: One Health, planetary health, climate & health and ecology, biodiversity & health; contribution of human health to sustainable development.
Equitable access to health	- Equity in health services, financing and governance; - Social protection and Universal Health Coverage; - Primary health care and health systems strengthening; - Equity in access to drugs, vaccines and diagnostics.
Health communication and miscommunication	- Health communication, use of social media in health; - Health literacy; - Political dimensions of health; - Science diplomacy, vaccine hesitancy.
Information technologies for health	- Digital health, co-creation; - Open data access, FAIR data, health information systems; - Artificial intelligence; decision support systems; - Data ownership, privacy and ethics.

LERU and EGHRIN believe that there are many questions in Global Health research that need to be answered by a comprehensive, multifaceted, approach. Universities and research institutes have a significant part to play in providing these answers.

2. Introduction

The Global Health Town Hall meeting was held in Barcelona on June 13th-14th 2022. Inspired by the previous Town Hall meetings organised by LERU, the meeting aimed to address universities' contribution to research in Global Health, where EGHRIN is a leading network. LERU's contribution aimed to identify and further develop themes in Global Health to be addressed in the coming years, to forge interdisciplinary collaborations in this area within their membership base, and to advance advocacy efforts to define a Global Health research agenda for Europe.

These developments were partly stimulated by the COVID-19 pandemic. COVID-19 has contributed to revisiting and redefining the Global Health research and innovation agenda in two ways. First, by highlighting the main health priorities/issues to be addressed globally in the post-pandemic era, and second, by showing what the impact of the pandemic has been on other health issues and in terms of preparedness and response, equitable access to health and keeping populations healthy at all levels. Moreover, the pandemic has had an undeniable impact globally on non-health related sectors such as the economy, global trade and political stability.

The concept of this meeting, similar to those organised by LERU in the past, started to take shape at the Joint Deans' Meeting[1] organised by LERU in 2021. At that meeting it was agreed that health should be considered a global rather than domestic issue. Sub-themes were identified that covered different disciplines, with overlaps and interactions, particularly from the perspective of integrated approaches such as One Health and planetary health. Later that year, LERU identified its objectives of potential collaboration with EGHRIN for promoting Global Health: (1) To define a set of big themes in Global Health to address in the coming years; (2) To forge collaborations within and across LERU universities around these themes; (3) To develop those big themes into research agendas and (4) To define an advocacy/lobbying strategy for these research agendas.

In this context, the meeting was structured around four themes: (1) Healthy and sustainable societies; (2) Equitable access to health; (3) Health communication and miscommunication; and (4) Information technologies for health. These topics were identified as relevant for Europe and beyond, with potential for inter-disciplinary and geographically collaborative research, linking education and research to translation to both policy and interventions, particularly through European funding.

For each theme, a keynote presentation was followed by a panel discussion and breakout sessions. This approach intended to facilitate interactions between different disciplines to find common solutions (co-creation). The composition of the breakout groups was carefully designed to have a balanced representation of various disciplines and LERU/EGHRIN member institutes, and the discussions were facilitated by the organising institutions. These discussions provide the core of the recommendations contained in this document.

The present document has two main objectives: (i) to create inputs for the European Union Global Health Strategy (ii) to create inputs to formulate a LERU-EGHRIN joint interdisciplinary research, innovation and education agenda.

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[1] Brought together Deans from the Social Sciences and Arts, Biomedicine and Life Sciences, and Natural Sciences.

3. Healthy and sustainable societies

Keynote speaker: Prof Shabbar Jaffar

The last 20 years have seen the development of effective tools for, and improved access to treatment for infectious diseases such as HIV, tuberculosis and malaria. This has led to great success in reducing mortality in low resource settings, although there is still a huge disease burden, especially in difficult-to-reach populations. Simultaneously, most countries are experiencing an epidemiological transition from communicable to non-communicable diseases (NCD): by 2030, mental health and non-communicable diseases will cause more premature deaths in Africa than all infections combined. Effective health systems will be essential to navigate these and other future health challenges.

The main challenges to ensuring healthy and sustainable societies in the foreseeable future are, firstly, the lack of evidence on how to adapt and scale-up health tools or interventions, especially towards hard-to-reach populations and communities, and secondly to guide health systems, authorities and policy makers especially during pandemics/epidemics. We need a stronger emphasis on prevention strategies and more robust evidence on (i) NCD biology, (ii) effective treatment strategies in low resource settings to address the fragmented and vertical delivery of NCD healthcare services, and (iii) climate and environmental change and its effects on health in low-resource settings.

To fill these knowledge gaps, it is crucial to encourage research on: (i) prevention and how to engage and communicate with different communities/patients to enhance it, (ii) chronic care organisation and monitoring at scale, multimorbidity and disease evolution and (iii) monitoring climate change and its effects on health in low-resource settings.

To effectively do this, equitable partnerships between researchers from high- and low-income settings are needed, as well as more partnerships and involvement of policy-makers, communities and patients to address questions of relevance.

This area was divided into subthemes, each with specific knowledge gaps to be addressed. In the first subtheme, *Health promotion and prevention for non-communicable diseases and mental health* (Thomas G. Schultze, LMU Munich), the main gaps were to do with mental health: a generalised lack of access to mental health treatment, as well as a lack of human resources, that end up causing a delay in the diagnosis of mental health conditions.

In the second subtheme, *Strategies against poverty-related diseases* (Meta Roestenberg, Leiden University Medical Center), gaps, (which were highlighted by the COVID-19 pandemic), are related to equity in R&D. The poor investment in product development and innovation/interventions for poverty-related diseases, as well as the difficulty to establish a business model for a poor market and post-licensure policies, create an unequal environment that can only improve by empowering the Global South to manage the research agenda.

As for the third subtheme, *Preparedness for and response to health emergencies and pandemics, health system and societal resilience* (Judith Vall Castelló, University of Barcelona), the main gaps identified were in the public health system and services, that have chronically suffered from inadequate budgetary allocation. This has affected surveillance and data availability. There is a need to identify better strategies to foster coordination and synergism among Global Health governing bodies, policy makers and healthcare delivery systems, as well as improve the promotion of post-pandemic/disaster services, such as mental health services.

Finally, for the last subtheme, *Health in relation to the environment* (Cathryn Tonne, Barcelona Institute for Global Health), three main challenges are described: integration of planetary health and Global Health agendas, knowledge on how interactions of different exposures such as infections or pollution affect our health, and implementation, to identify the best synergistic strategies that will not lead to further degradation of the environment and ecosystem, by leveraging global governance, finance, science and technology.

These sub-themes were discussed in the breakout sessions, where different topics were brought up, and some common conclusions were reached. Firstly, community-based actions are seen as necessary and impactful, in mental health, poverty-related diseases and environmental health. Communication is also essential, and it is an area of improvement for preparedness and environmental health. Education is seen as a useful tool as well, especially in mental health. Scaling-up capacity building in low resources settings is also a priority: collaborative platforms for NCD research, product development partnerships for poverty-related diseases, health data system architectures for preparedness and implementation research for environmental health are some examples. Lastly, further research is needed in different areas: for example, determinants of NCD and mental health, implementation science, or health impact assessment are some examples.

4. Equitable access to health

Keynote speaker: Tamás Evetovits, Head of WHO Barcelona Office

The presentation focused on financial protection, a key matter in equitable access to healthcare. Despite the importance of Universal Health Coverage, insurance coverage as such is not a good indicator of financial protection. More insightful indicators of financial protection are catastrophic out-of-pocket hardships and impoverishing out-of-pocket payments. Over the past 5 years, evidence from 34 countries has shown that the poorest households are the most likely to experience catastrophic spending. How you measure matters: we need equity-sensitive metrics with policy relevance in Europe and beyond, identifying not only the people who are suffering financial hardship but also the effectiveness of existing policies. The challenges in financial protection have to do with the difficulty in covering all health service spending, especially for medication (the main driver of financial hardship in European countries and countries with poor financial protection), and for outpatient services where financial protection policies usually focus on access to inpatient care. In addition, contributory health insurance, where the covered individual has to make contribution payments, has been shown to be a failure in high-income countries and should not be exported to low-resource settings. Research to overcome these challenges should focus on:

- Coverage policies for medicines: Evidence on effective financial protection mechanisms for prescription medicines;

- Linking financial hardship to unmet needs: particular gaps in coverage lead to financial hardship for the rich and unmet need for the poor;

- Effective policies that protect people from financial hardships, and cover the whole population.

This topic was divided into subthemes, addressing different perspectives of equity in access to health. The first subtheme, *Equity in health services, financing and governance* (Benedict Oppong Asamoah, Lund University) raised the question of quality in health services, and what exactly one gets when getting insurance. How to systematically incorporate new measures and indicators to monitor progress in equity, and how to promote generalised usage of these new measures are pressing questions that need to be addressed. The second subtheme, *Social protection and Universal Health Coverage* (UHC) (Fabrizio Tediosi, Swiss Tropical and Public Health Institute), highlighted the importance of social protection policies to protect people from the risk of poor

health. Social networks are underutilised even though they are huge assets for social support. The problem lies in how to leverage and support these informal social networks to improve social protection and how to implement UHC policies without leaving anyone behind, especially the vulnerable groups. The third subtheme, *Primary health care and health systems strengthening* (Jeffrey Lazarus, University of Barcelona), addressed the challenges of engaging community-based organizations to improve access to primary health care for marginalised groups/communities. One possible solution may be digital health, but that constitutes a challenge on its own. Moreover, primary health care should remain functioning during public health emergencies, and finding strategies to guarantee this is a priority. The fourth and last subtheme, *Equity in access to drugs, vaccines and diagnostics* (Anniek de Ruijter, University of Amsterdam), explored the legal framework of equity in access to health. To move ideas from science to policy, we need law and legal systems to balance the rationing of public goods and policies that we care about. That is why we need more research on regulatory factors that influence access to health and medicines. In a time of globalisation and Europeanisation, we need to explore and acknowledge the impact of EU internal regulatory regimes in access to healthcare and medicines in other parts of the world. Additionally, we need to address inequity within the EU. For instance, the EU jointly purchased COVID-19 vaccines during the first wave of the pandemic. However, there was no equitable distribution system so that countries with a higher medical need would receive the first batches of these vaccines.

These sub-themes were discussed in breakout sessions, and several joint conclusions were reached. A consensus was that more research is needed on this topic: on the benefits of UHC, on the barriers to access healthcare, behavioural science to understand how vulnerability can be measured, on how to prepare primary care for health emergencies and on the difference between welfare state aspects of health systems among different populations. Another important point was on education, for policy makers and population alike, on different topics such as inequity and digital health, as well as on community-based actions, for primary care strengthening and for leveraging informal networks to improve social protection. The importance of legal norms was insisted upon, both for improving access to health and for coordinating UHC policies with social protection systems. Capacity building was another joint solution: improving data quality and scaling-up affordable and sustainable UHC policies were some of the examples mentioned.

5. Health communication and miscommunication

Keynote speaker: Marc Van Ranst, KU Leuven

During the pandemic, misinformation was a widely discussed topic. Currently, there is a tendency for fake news to overtake facts in the media. False news has had negative implications for human behavioral adherence to COVID-19 regulations and vaccination. Communicating with, and through the media, may have negative consequences, and in some cases, can even be life-threatening.

There are several challenges for communication in health. First of all, there seems to be a mobilisation against science through publications, mainstream media and social media, which is hard to fight against. Second, the general public cannot handle evolving scientific knowledge well, and there is a tendency to distrust scientific experts, in part because of the questionable "experts" who gained popularity during the pandemic (rogue scientists, captain hindsights, instant virologists). Last but not least, political weaponisation of the online landscape has created a divided society.

It is clear that we are not ready to effectively cope with a new pandemic yet. Many people who participated in communication during the COVID-19 pandemic will not be visible in the next pandemic, due to the hardships/danger they experienced. We have to safeguard free speech but get rid of hate speech. For this to happen, everyone has to take action, especially media regulatory and governing bodies, government authorities and Global Health leaders.

The topic of health communication was divided into four sub-themes that reflect different sides of the problem. The first subtheme, *Health communication, use of social media in health* (Claudia Pagliari, Edinburgh University), advocated for more investment and expertise to identify effective ways of communication between publicly funded health institutions and the public. Technology is our ally: there is an under-utilisation of social media data e.g Twitter, Facebook as data for digital disease surveillance. We have opportunities to synthesise other sources of information with Artificial Intelligence (AI) or quantum computing for better intelligence on future pandemics.

The second subtheme, *Health literacy* (Lies Sercu, KU Leuven), outlined the ability of people to find, understand and use information to the benefit of their health. It is important to identify to what extent people and healthcare organisations are health literate. We need to find out what communication strategies can be used to improve health literacy of various groups among the public, given their specific challenges and limitations. There is a need to study and understand the interplay between different media platforms and groups in the public, given their limited or advanced health literacy. Future research is needed to identify effective strategies to educate and improve health literacy of young adults.

The third subtheme, *Political dimensions of health* (Ana Antic, University of Copenhagen), advocated for a better understanding of political framings and narratives. Further research is needed on the kind of political themes, symbols, historical comparisons and parallels to be drawn from different settings to promote or discredit certain policies. Different forms of political, social and economical crises occurred during the pandemic. How can we make sense of these complex interactions and communicate them better? How do specific socio-political and cultural contexts shape or impact mental health? There is a need for robust research and collaborations with behavioural sciences, cultural psychiatry, anthropology, etc. to better understand this problem.

The fourth and last subtheme, *Science diplomacy, vaccine hesitancy* (Antoni Trilla, University of Barcelona), stated how in public health, false science brings real damage. Healthcare professionals are one of the most reliable sources of information to the general public with regard to vaccination. Emphasis on behavioural science of vaccines is needed, to understand how to improve the knowledge of vaccination and how to mitigate vaccination hesitancy, vaccination apathy and the anti-vaccination movement in the EU. We also need to find a way to address and improve the role of universities in pre-bunking and debunking misinformation about vaccines. The COVID-19 pandemic highlighted good and bad examples on access and distribution of COVID-19 vaccines; we need to improve access and equitable distribution of vaccines in different settings through a multidisciplinary approach.

The four sub-themes were discussed in breakout sessions. Research is needed to fill knowledge gaps in different topics, such as vaccine hesitancy, social media use for health or health literacy. The Global North can, and should, learn from the Global South in how affected groups have increased their literacy of specific diseases and consequently advocated for their right to health (e.g. TAC[2] in South Africa on HIV through treatment literacy and community mobilisation). This can be applied to health literacy and vaccine hesitancy, with community-based actions at the centre of the strategy. A policy point of view is needed to fully understand this wide and complex topic, as well as a multidisciplinary approach and a strong health communication governance that stands for accountability and good practices.

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[2] Treatment Action Campaign

6. Information technologies for health

Keynote speaker: Ana Fernández del Río, benshi.ai

Information technologies can be used to improve the population's health. Artificial intelligence can be used for equitable health care by nudging patients' and providers' behaviours towards better health outcomes. Additionally, mobile applications have become an exceptional way of communication and their data can serve as a unique source of information with the potential to democratise data-driven personalised interventions. Personalised interventions can be provided and policy interventions facilitated by organising users' data and predicting their behavior. Achieving those goals can be supported by software that builds personalised and engaging mobile health applications; uses adaptive online experimentation (RCTs, MRTs, MABs), impact indicators and observational studies; tracks, processes and organises the data; and creates predictions and recommendations that can be used to target users by reinforcement learning-based intervention and decision making. Digitalisation and data-centric tech solutions are applicable in epidemiology, women's health, pharmacy and primary care. They can promote improved health practices of patients and providers through adaptive interventions, as well as contribute towards evidence-based policy making.

This topic was divided into three subthemes.

In the first subtheme, *Open data access, fair data, health information systems* (Mirjam van Reisen, Leiden University), raised the question of how to use fair data policies and IPR (Intellectual Property Rights) to create or enhance interoperability between health/patient data and scientific data. A related issue is data visiting regulations, and how to maintain or create (if non-existent) data ownership in places where research is done and to what extent data analysts can visit/access the data across jurisdictions. We need to find out how to create meaningful interoperability at point-of-care of vertical digital solutions.

In the second subtheme, *Artificial intelligence, decision support systems* (José Balibrea, Hospital Clínic de Barcelona), discussed the limitations of AI in health. First, while AI provides evidence-based information, it is not clear to what extent AI algorithms can interpret patient-related outcomes, experiences or incidences. Second, and similar to pharmacovigilance, we may need teams, frameworks and tools to monitor AI algorithms' outputs and evaluate which are effective and which are not. Third, there is the question of ethical and legal rules and regulations for successful AI operations. We need clear-cut responsibilities, transparency and accountability.

In the third subtheme, *Digital health, co-creation* (Andrea Evers, Leiden University), discussed health and digital literacy as a challenge, not only in Europe but around the world. We need better strategies to improve the health digital literacy gap globally. The main challenges have to do with the integration of digital technology to enhance patient or user communication, responsibility and accountability for structural biases, and data protection and ownership especially in low-resourced settings, even as we scale up digital health. We need an interdisciplinary approach with social scientists and other disciplines to find the best strategies for these challenges.

These three sub-themes were discussed in breakout sessions. There was a consensus that more research is needed to define the process, while Findable, Accessible, Interoperable and Reusable (FAIR) policies are also a priority. It is of utmost importance to find a balance between research and policy needs, and privacy and data protection. The most important concept here is accountability: it is necessary to evaluate and validate tools, creating new regulations based on ethics and fair partnerships. Accessibility is another concern: scaling up open access to science and education for the population are common demands.

7. Conclusions and recommendations

The LERU-EGHRIN Town Hall meeting aimed to identify Global Health research priorities in the post-pandemic era under selected key themes and to discuss action plans from shortcomings observed during the COVID-19 pandemic.

The four key themes were selected to provide different perspectives on population health, capturing some of the diverse topics that shape Global Health today. The sub-themes raised questions about crucial areas of the key themes, discussing the knowledge gaps that need to be addressed in the near future.

These subthemes were then discussed by groups in breakout sessions. Even though the themes and subthemes were very different, the solutions and suggestions proposed for them were not so divergent.

The main priorities for each key theme, arrived at by concensus, were the following:

1. Healthy and sustainable societies

Keynote Challenges & Research Gaps:

- We have developed effective tools and improved access to treatment for infectious diseases for disadvantaged populations, but there is still a high burden of infectious diseases in low-resource settings and hard-to-reach populations:

  o Lack of evidence on how to adapt and scale up tools and interventions.

- Transition into Non-Communicable Diseases (NCDs) and mental health, coupled with high burden of infectious diseases in low-resources settings and difficult to reach populations:

  o Need to put emphasis on prevention rather than treatment;

  o Lack of research on disease biology, diagnostics, treatment and epidemiology with regard to NCD and Mental Health, chronic care organisation and monitoring at scale, multi-morbidity and disease evolution.

- Covid-19 pandemic highlighted the fragility of most Health Systems (HS):

  o Lack of evidence to guide HS, authorities and decision makers driving epidemics/pandemics (pandemic preparedness).

- Effects of environment & climate change on human health, especially in low-resource settings:

- How to communicate and engage with communities / patients.

Panel Discussion & Break-outs Challenges & Research Gaps:

- Health promotion and prevention for NCDs and mental health:

  o Need for a systemic approach which is people-centered, includes the social determinants of health, and is trans-sectional. The community and context has to be considered for all interventions;

  o Mental health to be addressed both in HICs and LMICs: prevention and early diagnosis; access to treatment; lack of HHRR and capacities; target children & adolescents.

- Strategies against poverty-related diseases:

  - Address the gaps in equity and R&D (e.g., COVID-19), plus gaps in translation of services. Strategies should not only focus on product developments but also on strengthening services and systems;

  - Learnings from the Global South, especially through frugal and reverse innovations. There is a need to provide better access for investments developing efficient and innovative products (e.g. through crowdfunding) and access to R&D funding for Global South to manage their own R&D agenda;

  - Strategies should be community based and involve affected populations.

- Preparedness for and response to health emergencies and pandemics, health system and societal resilience:

  - Promotion of public health services within public health care systems. Adequate allocation of resources in health systems;

  - Better strategies for coordination and synergies amongst all stakeholders. Research for health promotion & disease prevention, involving both policy makers and the public. Research on health literacy and communication; Capacity building on data structures and quality assessment. Role of e-health and technologies, with design also fitting local needs;

  - Linkage of health systems & societal resilience with climate change adaptation, including health systems strengthening in LMICS for climate change and other disasters' adaptation;

  - Linkage of health emergency response with SDGs, through frameworks and testable approaches, minimising the environmental impact of emergency responses.

- Health in relation to the environment:

  - Holistic approaches for supporting policies on mitigation and adaptation to global environmental changes, expanding systems boundaries between Global Health research and ecosystems/earth systems. There is a need for a multidisciplinary approach;

  - Integration of the planetary health and Global Health agendas;

  - Research on how the interactions of different exposures such as infections or pollution affect our health;

  - Effective, equitable and acceptable pathways for transformative change (implementation research, Health Impact Assessment, communication, …);

  - Strengthen environmental research participation, especially in low resource settings and in local levels.

Recommendations:

- Equitable research partnerships (LMICs + HICs) to ensure that that the needs of local societies are understood;

- Involve of policy makers, communities, citizens and patients, focusing on prevention;

- Strengthening health systems to efficiently serve theirscommunities, with a special regard for disadvantaged populations;

- Evidence on how to adapt and scale up health tools or interventions, especially for hard to reach populations/communities.

2. Equitable access to health

Keynote Challenges & Research Gaps:

- Equity-sensitive metrics with policy relevance in Europe and beyond that identify not only the people who are suffering financial hardship but also the effectiveness of existing policies.

- Coverage policies for medicines: Evidence on effective financial protection mechanisms for prescription medicines.

- Linking financial hardship to unmet needs: particular gaps in coverage lead to financial hardship for the rich and unmet need for the poor.

- Effective policies that protect people from financial hardships, and cover the whole population.

Panel Discussion & Break-outs Challenges & Research Gaps:

- Equity in health services, financing and governance;

- Social protection and Universal Health Coverage;

- Primary health care and health systems strengthening;

- Equity in access to drugs, vaccines and diagnostics.

Recommendations

Product development and innovation/interventions for poverty-related diseases (TB etc.) remain greatly behind other diseases. Market failure is an issue as margins are too low for pharmaceuticals to be interesting for the pharmaceutical industry. Several non-profit public infrastructures across the world could greatly help in this regard, yet it is important that these are backed up by public research and development.

3. Health communication and miscommunication

Keynote Challenges & Research Gaps:

- Mobilisation against science through grey literature, the press, mainstream media and social media, which is hard to fight against;

- The general public cannot handle evolving scientific knowledge well, and there is a tendency to distrust scientific experts;

- Political abuse of the online landscape has created a divided society;

- Everyone has to take action, especially media regulatory and governing bodies, government authorities and Global Health leaders.

Recommendations:

- Better understand the links between health communication, health literacy and political factors - on disparate and inequitable health outcomes

- Health communication, use of social media in health:

  - Identify effective ways of communicating between publicly-funded health institutions and the public, including IT and AI technologies.

  - Understand the unequal negative consequences of poor health communication and develop mitigation strategies.

- Health literacy

  - Define health literacy, what it should encompass, its focus (public or individual health), its target group and who should provide health literacy services;

  - Need to find out which communication strategies can be used to improve health literacy of various groups (online and offline); need to work with target groups directly (e.g., children and not through the parents); need to learn from groups like the Treatment Action Campaign (TAC) how to organise health literacy with the affected group not for them);

  - Need to understand the interplay between different media platforms and groups in the public, including young adults.

- Understand the unequal negative consequences of poor health literacy and develop mitigation strategies.

- Political dimensions of health

  - Need for better understanding of political framings and narratives;

  - Need for robust research and collaborations with behavioral sciences, cultural psychiatry, anthropology, etc;

  - Understand the consequences of political framing that may advantage or disadvantage social groups, and develop mitigation strategies.

- Science diplomacy, vaccine hesitancy

  - Emphasis on behavioral science related to vaccinations is needed;

  - Role of universities in pre-bunking and debunking misinformation about vaccines; avoiding polarisation; deconstructing anti-vaccination attitudes by using participatory research and approaches (role-plays in teaching, etc.);

  - Need to improve access and equitable distribution of vaccines in different settings through a multidisciplinary approach and global collaboration.

4. Information technologies for health

Keynote Challenges & Research Gaps:

- Mobile health, digitalisation and AI for improved health practices & equitable health;

- Mobile apps as unique sources of information;

- Democratisation of data-driven personalised interventions;

- Data to predict users' behavior and to provide personalised interventions and facilitate policy;

- Digitalisation and data-centric tech solutions applicable to epidemiology; improved health practices for patients and providers through adaptive interventions;

- Contribution to evidence-based policy making.

Panel Discussion & Break-outs Challenges & Research Gaps:

- Digital health, co-creation:

  - Research is needed in all dimensions of the use of digital tools for effective health interventions;

  - Better strategies to improve health and digital literacy globally;

  - Biases in digital health;

  - Health data ownership and protection;

  - How are these solutions validated and how do they impact stakeholders' responsibility issues?;

  - How do these solutions impact cybersecurity, user responsibility and risk of stigmatization?

- Open data access, Findable, Accessible, Interoperable and Reuseable (FAIR) data, health information systems:

  - Fair policies and federated data analytics:

    - Use of FAIR data policy (IPR) to create/enhance inter-operability between health patient data and scientific data;

    - Support global south in FAIR data science;.

  - Open science / data: Regulations on data ownership, access to data, data use….;

  - How to create meaningful interoperability at point of care vertical solutions?;

  - Federal, ethical & legal regulations.

- Artificial intelligence; decision support systems:

  - Definition of process (from input selection to outcome definition) in order to obtain a specific result: validation of tools, stakeholders' engagement, response/selection bias; investment;

- M&E frameworks / tools for AI algorithms outputs to identify effectiveness - M&E of the transition from the algorithm validation to application in patients (equivalent to pharmacovigilance);

- Ethical and legal rules and regulations for successful AI operations (responsibility, transparency, accountability) at all levels. Determination of responsibility.

- Data ownership, privacy and ethics:

  - Balance between privacy/protection and research/policy needs;

    - Knowledge and attitudes of the population;

    - Improved audacious healthcare/patient data;

  - Ethics and fair partnerships:

    - Research on models to create or enforce data ownership in the global south;

    - Models that improve ethical data provenance;

    - How to ensure ethical, fair data pipelines for AI solutions in health linkage of private data.

  - Data Safety

    - Ensure availability and safety of data.

The following are general recommendations to address the identified knowledge gaps:

- While more funding for health research is always needed, it is also important to prioritise according to needs. More investment has to be made in order to identify priority knowledge gaps in key issues for post-pandemic Global Health.

- Through proper education and open government policies (community-based actions, open science, accountability), the population, especially those from vulnerable sectors, can engage with Global Health and its policies, becoming active agents of change.

- High-income countries need to support comprehensive capacity building in the Global South, in order for low and middle income countries to become more independent in terms of research and implementation, eventually leading to a strengthening of their health systems and infrastructures.

- Global Health policymakers have to be in close and constant contact with academia to work together to come up with effective, evidence-based solutions to the new problems of the post-pandemic era.

The current situation of Global Health raises a multitude of questions that need comprehensive, evidence-based, community-centered answers, and the only way to provide them is through research, information, education and unity.