



**Global Health
Academy**



GLOHRA



**UNIVERSITÄT
BIELEFELD**

School of Public Health

Catalogue of Competencies in Global Health Research at doctoral and postdoctoral level



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Abstract

Researchers in the field of global health make a critical contribution to our understanding of health and health-related issues and to strengthening our ability to act on them within a wider globalised context. These “global health researchers” are, however, a highly heterogeneous part of the global health workforce. They come from diverse disciplines and approaches across the natural and social sciences as well as humanities; work in a variety of institutional, sectoral and geographic contexts; and, taken together, their focus spans the full spectrum of health-related challenges. Greater clarity is needed about the kinds of competencies, i.e. knowledge, skills and attitudes, that are essential for global health researchers, and how these can be progressively and systematically developed as part of education, training and professional development.

This Catalogue of Competencies in Global Health Research at Doctoral and Postdoctoral Level presents seven competency domains and 19 competencies seen to be essential for researchers in the field of global health. It aims to reflect the disciplinary breadth of global health and describe three levels (Basic, Skilled, Advanced) of progressive competency development during the doctoral and postdoctoral research journey, and beyond. Based on a global literature review and expert consultations, the Catalogue of Competencies was developed for the Global Health Academy, an initiative of the German Alliance for Global Health Research (GLOHRA).

The catalogue was designed specifically for application in the German context but may be relevant, applied and adapted to different contexts (institutional, disciplinary, country or other) with the aim of systematically enhancing research competencies in the field of global health. The Catalogue of Competencies is published as a “living document” in the spirit of shared learning.

Background and project overview



Background

Global health was initially characterised by its interdisciplinary foundation and transnational outlook seeking to understand the reciprocal relationships between health and social, economic, political, cultural and supra-territorial factors.¹ In the understanding of the Consortium of Universities for Global Health (CUGH) taken up by the German Alliance for Global Health Research (GLOHRA), it also extends to the natural environment and transdisciplinarity, including beyond study and research to also encompass practice and explicitly clinical care.² Global health is connected to, but often considered distinct from, other relevant fields including public health and international health, and more recently one health and planetary health. While definitions are contested and evolving, the field of global health has flourished in recent decades, with more interest, initiatives, actors and resources flowing in. One important subgroup of the global health workforce are researchers who are active in research relevant for the field of global health. These 'global health researchers' make a critical contribution to our understanding of health and health-related issues and to strengthening our ability to act on them within the wider globalised context. They are, however, a highly heterogeneous group, coming from diverse disciplines and approaches across the natural and social sciences as well as humanities, working in a variety of institutional, sectoral and geographic contexts, and, taken together, their focus spans the full spectrum of health-related issues. This raises important questions in terms of what kinds of competencies, i.e. knowledge, skills and attitudes, are seen to be essential for researchers in the field of global health, and how these competencies can be progressively and systematically developed as part of their academic or professional education, training and development.

Aims and Purpose

The objective was to develop a catalogue of competencies in global health research at doctoral and postdoctoral level for the Global Health Academy, a GLOHRA initiative, which reflects the disciplinary breadth of global health as well as different levels of competencies. At the same time, the competency catalogue can inform other activities and efforts to systematically enhance research competencies in the field of global health. The catalogue was designed specifically for application in the German context and for use by GLOHRA and its members. It can be applied and adapted to different contexts (institutional, disciplinary or other) and may be relevant and adapted beyond this. Possible application areas include but are not limited to the development of curricular and programs, design of evaluation criteria, and as a dialogue tool and means of communication in interdisciplinary teams. The competency model may additionally support dialogue and foster common understanding across the diverse GLOHRA community and global health research landscape. Ultimately, it may point to ways to cultivate the further advancement of research, education and training initiatives, as well as financing for global health research and researchers in Germany and beyond.

Target audience

The primary target audience of this catalogue are people working in institutions that conduct research in the field of global health. They are either working with/for or are themselves researchers who study and work at doctoral and postdoctoral level. This includes curriculum developers, programme coordinators, teachers, trainers and supervisors, among others, as well as doctoral and postdoctoral researchers in the field of global health themselves. Researchers at early-, mid- and late career levels may find the catalogue useful in shaping their own research, management and supervision, programme and course teaching, and other activities relevant to global health research.

Methods

The development of the Catalogue of Competencies was informed by evidence, discourse and current good practice examples related to competencies in global health, doctoral research and especially global health research. Specifically, the catalogue was informed by (i) a systematic literature review of key competencies for global health research in Germany and internationally; (ii) a mapping of a selection of existing competency catalogues and models; (iii) a secondary analysis of outputs from a previous GLOHRA Global Health Academy project related to global health research education and training; and (iv) consultations with GLOHRA members engaged in the Steering Committee and Academic Advisory Board as well as with German and international experts (see [Acknowledgements](#)).

The competency catalogue is based on and adapted from the PhD Competence Model, designed by the Dutch University Medical Centers.³ The six core competency domains of this model were adapted or replaced based on the findings of this project. Furthermore, the catalogue draws in an intersecting way from the Dreyfus & Dreyfus model of skill development^{4,5} and Bloom's taxonomy of educational objectives and assessment⁶. More than 25 German and international global health researchers and experts participated in consultations between July and November 2024 to provide inputs on, evaluate and build consensus regarding the competency catalogue. More information on the methods can be found in [Annex 1: Methods](#).

1 Bozorgmehr K: Rethinking the 'global' in global health: a dialectic approach. *Global Health* 2010, 6: 19. doi: 10.1186/1744-8603-6-19.

2 Koplan J P et al.: Towards a common definition of Global Health. *Lancet* 2009, 373: 1993–1995. doi: 10.1016/S0140-6736(09)60332-9.

3 Stouthard M & Cohen A: PhD Competence Model. *Intrinsic Activity*, 2016; 4 (Suppl. 1): A3.5. doi:10.25006/IA.4.S1-A3.5. Specifically, the current version from September 2017 was drawn upon, e.g. as used by the Graduate School of Life Sciences at Utrecht University (see details) and Amsterdam UMC (see details).

4 Calhoun JG, Rowney R, Eng E & Hoffman Y: Competency mapping and analysis for public health preparedness training initiatives. *Public Health Rep.* 2005, 120(Suppl 1): 91–9. doi: 10.1177/00333549051200S117.

5 Dreyfus SE & Dreyfus HL: *Five-Stage Model of the Mental Activities Involved in Directed Skill Acquisition*. Unpublished report, University of California, Berkeley 1980.

6 Bloom, BS, Engelhart, MD, Furst, EJ, Hill, WH & Krathwohl, DR: *Taxonomy of Educational Objectives. The Classification of Educational Goals. Handbook 1: Cognitive Domain*. New York: David McKay 1956.



The Catalogue of Competencies in Global Health Research at doctoral and postdoctoral level

Introduction

Overview

Competencies include aspects such as knowledge, skills and attitudes. Having competence means that a person can engage effectively in different situations and contexts. This catalogue of competencies for global health research, shown in Figure 1, includes seven competency domains with 19 competencies (**Domains 1-7**). It also reflects that these seven competencies are progressively developed in a deeply interlinked way with the prior and ongoing discipline(s)- specific formation (Domain 0). The progressive development of competencies is delineated in this catalogue into three levels, being Basic, Skilled and Advanced.



Figure 1

Capturing the journey of developing global health research competencies

Researchers have research competencies that are specific to the discipline(s) in which they have previously studied and they aim to further strengthen these competencies during their doctoral and postdoctoral research (**Domain 0**).

Intertwined with this prior and ongoing disciplinary formation, global health researchers also aim to foster their global perspective for research (**Domain 7**). Domain 7 represents the development of a broader mindset and a cross-cutting understanding of the global context needed to conduct global health research. Global health researchers develop these two foundational competency domains in a deeply interlinked way, and they are therefore represented as the inner and outer circles in the figure.

Between the two circles are six specific competency domains for global health research (Domains 1-6). The journey of building competencies and a career as a global health researcher requires researchers to progressively develop their knowledge, skills and attitudes related to global health research principles, concepts, methods and approaches (**Domain 1**). These competencies are developed through education, training and research experience from the doctoral level and into postdoctoral level, which interfaces with discipline-specific research skills and knowledge. Given the diversity of disciplinary backgrounds and global health research, this journey will play out differently for different researchers.

The competency **Domains 2 to 6** include essential competencies for all doctoral and postdoctoral researchers in any field, and are based on the PhD Competence Model designed by the Dutch University Medical Centers³. However, the precise nature, content and operational realities of these competencies must be specifically adapted for the field of global health research. Different levels of competence, from basic to advanced, for each domain and competency can and will be developed and achieved at different points during the journey from beginning doctoral research through to senior postdoctoral level. As above, this journey will look different depending on the disciplinary origin and anchor of the researcher and their specific research focus within the field of global health. Different competency domains and competencies may also be more or less relevant at different points in the doctoral and postdoctoral journey. For example, competency **Domain 2** on responsible conduct of science is different for the various types of research in the field of global health. It requires special competencies for researchers who conduct research directly with population groups (e.g. through qualitative interviews), especially people in situations of vulnerability or marginalisation, and quite different responsibilities for those doing research in a laboratory, a clinical setting, using computer modelling, or of a more theoretical nature. Ultimately, some researchers may become advanced in selected domains but stay at a basic level (i.e. minimum requirement) in others.

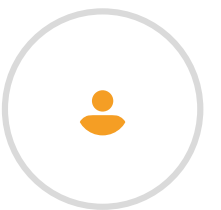
In the figure, **Domain 7** is the outer circle that can be seen to encompass, underpin or reflect all the other competencies needed to be a qualified and successful “global health researcher”. It represents the result of all the competencies coming together where the whole is more than the sum of its parts.

Levels of competency

The catalogue proposes three levels of competency acquisition: **Basic**, **Skilled**, and **Advanced**. The **Basic** level is understood to require limited experience, a basic understanding of concepts and practices and the ability to increasingly follow these. At this level, improvements are made under close supervision. The **Skilled** level requires an understanding of the situation and context, which is based on experience and a corresponding adaptable response to this in accordance with the rules and good practices in the field, while receiving guidance and support or supervision. At **Advanced** level, actions and decisions are executed independently and intuitively and, as more expertise is consolidated, researchers are able to evaluate and further advance or develop new approaches in the field. In this way, advancement of competencies to or at Advanced level may continue beyond the postdoctoral period and in fact be part of the life-long learning of a researcher.

There is considerable diversity in the field of global health research, in terms of the study and career programmes and pathways as well as the nature of the research. As such, the catalogue does not propose that a specific competency level corresponds to or should have been achieved by the end of the doctoral or postdoctoral period. Broadly speaking, however, the doctoral period should include a focus on developing competencies from the Basic to Skilled levels (building on what was learned in Bachelor and Master degrees), and the postdoctoral period is more likely to denote a focus on further strengthening competencies from the Skilled to the Advanced level.

The individual user (e.g. institutions) are at liberty and responsible for determining which level is completed at what stage in, for example, a doctoral program, and what level must be acquired as a requirement to complete a programme. In adapting the catalogue to a doctoral programme, for example, the following questions may be helpful: (i) Who is responsible for ensuring that doctoral candidates develop these competencies? and (ii) How and when should the competencies be evaluated during the PhD process?



Basic



Skilled



Advanced



0 Discipline-specific research knowledge, skills and attitudes (disciplinary foundation)

Competency 0.1

Demonstrate knowledge of and ability to apply, adapt and advance core discipline-specific principles, concepts, theories, and frameworks.

Basic

Know about and comprehend core discipline-specific principles, concepts, theories, and frameworks.

Skilled

Appropriately apply core discipline-specific principles, concepts, theories, and frameworks under supervision.

Advanced

Independently apply and adapt core discipline-specific principles, concepts, theories, and frameworks and evaluate and further advance them.

Explanatory note

As discussed in the introduction section, researchers have a background in one or more disciplines, based on their previous studies, and the vast majority will be anchored to one or several main disciplines during their doctoral and postdoctoral studies. The advancement of their disciplinary-specific competencies can be achieved in parallel with, in an intersecting way with, or part of a cross-/inter/trans-disciplinary approach to the development of competencies related to global health research.

Competency Domain 0

is included to serve as a prompt for different research areas and disciplines within global health research to consider specifically how core-discipline competencies and global health research competencies will be relevant and intersect over the doctoral and postdoctoral journey. This should inform consideration of how this catalogue of competencies might need to be adapted to reflect these important contextual and operational factors. See additional guidance in [Note 1](#) in Annex 2.

Competency 0.2

Demonstrate knowledge of and ability to apply and adapt core discipline-specific research methods and approaches.

Basic

Know about and comprehend core discipline-specific research methods and approaches.

Skilled

Appropriately apply core discipline-specific research methods and approaches under supervision.

Advanced

Independently apply and adapt core discipline-specific research methods and approaches and evaluate and further advance them.

7 Global perspectives for research (mindset and context)

Competency 7.1

Demonstrate knowledge and comprehension of and respect for diverse perspectives and conditions as well as evidence on global issues related to health and the ability to sensitively reflect and manage values (e.g. equity), complexity, sustainability and a systems perspective in global health research. This entails striking a balance between particularity and universality in experience, norms and models.

Basic

Know about, comprehend and respect diverse perspectives and evidence on global issues related to health and principles, values and approaches to reflect and manage equity, complexity, sustainability and a systems perspective in global health research.

Skilled

Demonstrate commitment to and appropriately use and apply under supervision the principles, values and approaches to analyse, synthesise and evaluate diverse perspectives on global issues related to health and to reflect equity, complexity, sustainability and a systems perspective in global health research.

Advanced

Independently demonstrate commitment to and apply, adapt, evaluate and further advance the principles and approaches to analyse, synthesise and evaluate diverse perspectives on global issues related to health and to reflect equity, complexity, sustainability and a systems perspective in global health research, while critically examining one's own positionality and relate to others with respect and openness.

Explanatory note

As outlined in the Introduction, Competency Domain 7 reflects the overarching global perspective, which can be seen to encompass, underpin or reflect all the other competencies needed to be a qualified and successful "global health researcher". It is the outer circle in the figure, against which all the other competencies (including their cognitive and affective elements) are embedded. Such a competency is often emphasised in global health research and literature related to education and training of global health researchers, but often only described in general terms. This global perspective will look different for different researchers in the global health field (depending on discipline, research area and focus, etc.).

Users of this Catalogue of Competencies are encouraged to consider how to elaborate and operationalise Competency Domain 7 in a way that is relevant for their disciplinary, institutional and research context.





1 Global health research principles, concepts, methods and approaches

Competency 1.1

Demonstrate knowledge of and ability to apply and adapt the core theoretical and conceptual principles and frameworks for global health research.

Basic

Know about and comprehend the core theoretical and conceptual principles and frameworks for global health research.

Skilled

Appropriately apply under supervision the core theoretical and conceptual principles and frameworks for global health in the planning, design, conduct, evaluation and reporting of research (including responding and adapted to the needs of particular communities or contexts).

Advanced

Independently apply and adapt the core global health theoretical and conceptual principles and frameworks for global health in the planning, design, conduct, evaluation and reporting of research (including responding and adapted to the needs of particular communities or contexts), and evaluate and further advance them.

Non-exhaustive examples include:

health as a human right, health equity and social justice; evidence-informed decision-making and action; sustainability; determinants of health; global health agendas, including specifically the Sustainable Development Goals (SDGs); the foundations of primary health care and resilient and responsive health systems; One Health; Planetary Health.

Competency 1.2

Demonstrate knowledge of and ability to take account of the way that social systems, institutions or actors and socio-political contexts interact with global health research.

Basic

Know about and comprehend the way that social systems, structures and socio-political context interact with global health research, including the key actors, architecture and governance of health systems and global health.

Skilled

Appropriately apply and respond under supervision to an understanding of the way that social systems, structures and socio-political context interact with global health research, including in the planning, design, conduct, evaluation and reporting of research.

Advanced

Independently apply and respond to an understanding of the way that social systems, structures and socio-political context interact with global health research, including in the planning, design, conduct, evaluation and reporting of research, and how transformative research can contribute to solving society problems.

Explanatory note:

For an explanation of social systems and structures, see [Note 2](#) in Annex 2.

Competency 1.3

Demonstrate knowledge of and comprehension of determinants of health, their interrelations at local, national and global levels and the implications of these for global health research.

Basic

Know about, comprehend and identify the determinants of health and the implications of their interrelations and “globality” (from local to the global level, as relevant) for scientific activities in the field of global health research.

Skilled

Appropriately apply and respond under supervision to understand the impact of global health determinants on public health, health systems and health care, including in the planning, design, conduct, evaluation and reporting of research.

Advanced

Independently apply and respond in the planning, design, conduct, evaluation and reporting of research to understand the impact of global health determinants on public health, health systems and health care.

Non-exhaustive examples of determinants of health include: societal, economic, political, commercial, ecological or biological such as genetic and physical environmental.

Competency 1.4

Demonstrate knowledge of, the ability to navigate and literacy for published knowledge in the field of global health, to comprehend and evaluate scientific information and scientific evidence, and to make use of these insights for interventions in global health.

Basic

Know about where to search for and how to identify, comprehend, synthesise and evaluate credible evidence and scientific information generated using common methods and approaches in the field of global health research (i.e. demonstrate global health research literacy).

Skilled

Appropriately apply under supervision the principles and approaches to plan (including formulating specific research questions), design, conduct and report a review of global health evidence, including to identify, analyse and critically evaluate literature and scientific information that uses methods and approaches common in the field of global health research. Furthermore, be able to analyse implications and gaps for global health research and make use of these insights to inform the planning, implementation and evaluation of interventions.

Advanced

Independently apply, adapt, evaluate and further advance the principles and approaches for reviewing and reporting global health evidence, including to identify, analyse and critically evaluate literature and scientific information that uses different types of methods and approaches common in global health research. Furthermore, be able to analyse implications and gaps for global health research and make use of these insights to inform the planning, implementation and evaluation of interventions.

Non-exhaustive examples include: identifying scientific information (e.g. single studies) and scientific evidence (e.g. systematic reviews) from literature and evidence synthesis platforms, using relevant sources in discipline-specific and cross-disciplinary databases or repositories, etc. This also increasingly includes the ability to use and assess the quality of work produced using Artificial Intelligence (AI), machine-learning and linkages to data science.

Explanatory note: “Making use of insights” includes using scientific information and evidence to inform the design, implementation and evaluation of effective, efficient, acceptable and feasible interventions in or relevant to global health. E.g. the researcher might be directly involved in interventions, or provide guidance or inputs to those directly involved (e.g. via consultations or as members of expert or advisory boards).



1 Global health research principles, concepts, methods and approaches

Competency 1.5

Demonstrate knowledge of and the ability to apply, adapt and integrate methods and approaches from different disciplines in the field of global health research.

Basic

Know about and comprehend how methods and approaches from different disciplines are applied and adapted in the field of global health research, and the interrelations between different levels of global health research from microbiological to global level.

Skilled

Appropriately apply under supervision methods and approaches from different disciplines in the planning, design, conduct, evaluation and reporting of global health research, including recognising interrelations of this research with other levels of global health research.

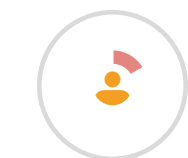
Advanced

Independently apply, adapt, evaluate and further advance methods and approaches from different disciplines in the planning, design, conduct, evaluation and reporting of global health research, including analysing interrelations of this research with other levels of global health research.

Non-exhaustive examples include:

laboratory-based basic and applied research; clinical studies; epidemiology, statistics, modelling and other quantitative methods; interviews, group discussions and other qualitative methods; review methods; and implementation and operational research, among others.

This also includes the use of AI, machine-learning and linkages to data science, both form a methodological and ethical perspective.



2 Responsible conduct of science in the field of global health

Competency 2.1

Demonstrate knowledge of, sensitivity to and the ability to apply, respond to and adapt the foundational principles, conventions and regulations of good scientific practice and research ethics in global health.

Basic

Know about, comprehend and demonstrate sensitivity to the above-mentioned foundational principles and requirements of good scientific practice and research ethics in global health.

Skilled

Demonstrate sensitivity to and appropriately apply under supervision the above-mentioned foundational principles and requirements of good scientific practice and research ethics in global health.

Advanced

Demonstrate sensitivity to and independently apply, adapt, evaluate and further advance the above-mentioned foundational principles and requirements of good scientific practice and research ethics in global health.

Non-exhaustive examples include:

acting with respect and integrity; responsible use of data and data protection; considering aspects of equity, and sustainability as well as environmental factors (e.g. own carbon emissions) and impacts of research; and considering the legal provisions and respective context. It also includes reflection on power and one's own positionality (see Note 3 in Annex 2). These aspects are particularly important when working with communities in situations of vulnerability and marginalisation and with international collaborators and in international contexts. E.g., in international partnerships, researchers from low- and middle-income countries are often included in the middle of the authorship list, rather than the prominent first or last author positions.

Competency 2.2

Demonstrate knowledge of and the ability to apply the fundamental norms and values of global health, namely health equity, human rights, and considerations for environmental and ecological sustainability, as principles and approaches in global health research. The human rights and equity perspective in particular requires attention to gender equality, intersectionality as well as the awareness of obstacles that hinder their progressive achievement.

Basic

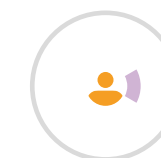
Know about, comprehend and demonstrate sensitivity to the above-mentioned principles and approaches, and the role of inequity, gender inequality, intersectionality, and environmental factors and the obstacles to meet human rights as fundamental drivers of global health issues.

Skilled

Demonstrate sensitivity to and appropriately apply under supervision the abovementioned principles and approaches in the planning, design, conduct, evaluation and reporting of global health research and practice as a researcher in this field, including to understand obstacles to their implementation.

Advanced

Demonstrate sensitivity to and independently apply, adapt, evaluate and further advance the above-mentioned principles and approaches in the planning, design, conduct, evaluation and reporting of global health research and practice as a researcher in this field, including to understand obstacles to their implementation.





2 Responsible conduct of science in the field of global health

Competency 2.3

Demonstrate knowledge of, sensitivity to and ability to apply and adapt structural competencies, i.e. linking health issues to upstream social factors, and competencies related to cultural diversity in global health research.

Basic

Know about, comprehend and demonstrate sensitivity to the principles and competencies related to cultural diversity and structural competency.

Skilled

Demonstrate sensitivity to and appropriately apply under supervision the principles and competencies related to cultural diversity and structural competency.

Advanced

Demonstrate sensitivity to and independently apply, adapt, evaluate and further advance the principles and competencies related to cultural diversity and structural competency, in the planning, design, conduct, evaluation and reporting of global health research.

Competency 2.4

Demonstrate knowledge and comprehension of the historical and political context of global health and of science, and their ongoing influence on global health research, including political ideologies, colonial continuities, political conflict legacies and globalisation.

Basic

Know about and comprehend the historical and political context of global health research and the above-mentioned ongoing impact and power dynamics (including historical continuities) that shape global health as well as scientific and research structures, systems, practices and partnerships.

Skilled

Demonstrate comprehension of and address (rather than reinforce) under supervision the historical and political context including the above-mentioned ideological continuities and ongoing power dynamics of global health research in the planning, design, conduct, evaluation and reporting of research.

Advanced

Independently demonstrate comprehension of, evaluate and address (rather than reinforce) the historical and political context, including the above-mentioned ideological continuities and ongoing power dynamics of global health research in the planning, design, conduct, evaluation and reporting of research.

Non-exhaustive examples of political ideologies include: racism; slavery; colonialism and (neo)imperialism; Cold War/East-West conflict legacies; fundamentalism and ideological totalitarianism; authoritarianism and nationalism; global capitalism, neoliberalism and free market ideologies, among others.

3 Collaboration in global health research across disciplines, professions and sectors

Competency 3.1

Demonstrate knowledge of, value for and the ability to apply and adapt the values, principles and approaches of inter- and trans-disciplinary, as well as inter- and transprofessional collaboration in global health research (including in the GLOHRA research areas of Biomedicine; Public Health; Social Sciences and Humanities; and Engineering and Other Sciences).

Basic

Know about and comprehend the values, principles and approaches of collaboration across and beyond disciplines and professions in global health research.

Skilled

Demonstrate commitment to and appropriately use and apply under supervision the values, principles and approaches of collaboration across and beyond disciplines and professions in global health research, including participating in and supporting effective and respectful collaborations with researchers and stakeholders across different qualifications and backgrounds and appreciating the value of diverse perspectives and approaches.

Advanced

Independently demonstrate commitment to and apply, adapt, evaluate and further advance the values, principles and approaches of collaboration across and beyond disciplines and professions in global health research, including designing, fostering and participating in effective and respectful collaborations with researchers and stakeholders across different qualifications and backgrounds and integrating and leveraging the value of diverse perspectives and approaches.

Competency 3.2

Demonstrate knowledge of and ability to apply and adapt the different values, principles and approaches of collaboration across multiple sectors, community engagement and participatory approaches in global health research (including collaboration between actors in e.g. academic, governmental, non-governmental, multilateral sectors, communities and private-for-profit sectors and taking account of vested and commercial interests).

Basic

Know about and comprehend the values, principles and approaches of collaboration across sectors, and community agency, engagement and participation in global health research.

Skilled

Appropriately use and apply under supervision the values, principles and approaches of collaboration across sectors in global health research, including participating in and supporting effective and respectful collaborations with researchers and stakeholders from different sectors and communities and appreciating the value of diverse perspectives and approaches.

Advanced

Independently apply, adapt, evaluate and further advance the values, principles and approaches of collaboration across sectors in global health research, including designing, fostering and participating in effective and respectful collaborations with researchers and stakeholders from different sectors and communities and integrating and leveraging the value of diverse perspectives and approaches.

Non-exhaustive examples of political ideologies include: long-term planning and patience given these processes are often more time intense; learning the “language” and vocabulary of other disciplines, stakeholders, and sectors; building trust; diplomacy and negotiation skills; and networking management skills.





4 Communication in global health research and knowledge translation of science and evidence

Competency 4.1

Demonstrate knowledge of, value for and the ability to adapt and perform effective, inclusive and appropriate scientific and non-scientific communication targeted towards and responding to diverse audiences in and relevant to global health research.

Basic

Know about and comprehend the values, principles and approaches for effective, inclusive and appropriate communication targeted towards and responding to diverse audiences in and relevant to global health research.

Skilled

Appropriately use and apply under supervision the values, principles and approaches for effective, inclusive and appropriate communication targeted towards and responding to diverse audiences in and relevant to global health research.

Advanced

Independently apply, adapt, evaluate and further advance the values, principles and approaches for effective, inclusive and appropriate communication targeted towards and responding to diverse audiences in and relevant to global health research, and foster these practices in others at individual and collective level.

Explanatory note: Communication includes verbal, listening, written and non-verbal formats. Audiences in and relevant to global health research including politicians, government staff, civil society organisations, non-governmental organisations, patients, specific concerned communities and the general public.

Competency 4.2

Demonstrate knowledge of and the ability to perform effective, inclusive and appropriate scientific communication, knowledge translation and support for the provision of scientific advice and uptake of evidence and adequate knowledge in processes of decision-making in global health, including engaging with people outside the scientific community.

Basic

Know about and comprehend the above-mentioned values, principles and approaches for scientific communication, knowledge translation and the uptake of evidence and adequate knowledge in decision-making in global health.

Skilled

Appropriately use and apply under supervision the above-mentioned values, principles and approaches for scientific communication, knowledge translation and the uptake of evidence and adequate knowledge decision-making in global health.

Advanced

Independently apply, adapt, evaluate and further advance the above-mentioned values, principles and approaches for scientific communication, knowledge translation and the uptake of evidence and adequate knowledge in decision-making in global health, and foster these practices in others at the individual and collective level.

5 Management and leadership in global health research

Competency 5.1

Demonstrate knowledge of, value for and the ability to apply and adapt the values, principles and approaches of goal-oriented and good teamwork and management in global health research, including relationship building, problem solving and lateral thinking to value and bring together different perspectives and creatively manage disagreement.

Basic

Know about and comprehend the above-mentioned values, principles and approaches in the planning, design, conduct, evaluation and reporting of global health research, including management of projects, people (e.g. promoting their health), materials and finances.

Skilled

Demonstrate commitment to and appropriately use and apply under supervision the above-mentioned values, principles and approaches, including management of projects, people (e.g. promoting their health), materials and finances (namely at project level).

Advanced

Independently demonstrate commitment to and apply, adapt, evaluate and further advance the above-mentioned values, principles and approaches, including management of projects, people (e.g. promoting their health), materials and finances at individual, project, team and institutional level.

Competency 5.2

Demonstrate knowledge of, value for and the ability to apply and adapt the values, principles and approaches of good support, mentorship and leadership in global health research, including active listening, empathy and self-reflection.

Basic

Know about and comprehend the above-mentioned values, principles and approaches in the planning, design, conduct, evaluation and reporting of global health research.

Skilled

Demonstrate commitment to and appropriately use and apply under supervision the above-mentioned values, principles and approaches, including at individual and collective level.

Advanced

Independently demonstrate commitment to and apply, adapt, evaluate and further advance the above-mentioned values, principles and approaches, including for individual academic or professional development and to foster positive and enabling work environments and dynamics with staff, colleagues, partners and other stakeholders.





5 Management and leadership in global health research

Competency 5.3

Demonstrate knowledge of and ability to identify, apply for and secure funding for global health research which adheres to a responsible and sustainable use of resources (material and financial).

Basic

Know about and comprehend the above-mentioned practices and processes related to global health research funding.

Skilled

Identify, apply for and secure funding for global health research in accordance with responsible and sustainable resource use under supervision and as part of a research team.

Advanced

Identify, apply for and secure funding for global health research in accordance with responsible and sustainable resource use with increasing independence and supporting the strategic conceptualisation and management of these process in coordination with supervisors, colleagues and other stakeholders.



6 Personal effectiveness and professional development as a researcher in the field of global health

Competency 6.1

Demonstrate knowledge of, value for and the ability to apply and adapt the values, principles and approaches of building and sustaining connections, networks and collaboration in global health research.

Basic

Know about and comprehend the above-mentioned values, principles and approaches of networking and collaboration in global health research.

Skilled

Demonstrate commitment to and appropriately use and apply under supervision the above-mentioned values, principles and approaches of networking and collaboration at national and international level, including to recognise and strategically share, disseminate and build on individual and team research goals and outcomes.

Advanced

Independently demonstrate commitment to and apply, adapt, evaluate and further advance the above-mentioned values, principles and approaches of networking and collaboration at national and international level, including to recognise and strategically identify, share, disseminate and build on individual, team, institutional and collaborative partnership research goals and outcomes.

Competency 6.2

Demonstrate critical self-reflection (reflexivity), continuous learning and flexibility in a changing environment (e.g. changing research circumstances due to natural disasters or political dynamics) in global health research. This includes values and norms (normativity), concepts and approaches as well as the skills (adaptability and creativity) to foster critical selfreflection about one's own perspectives, beliefs and biases as well as for continuous learning to consider alternative viewpoints and paradigms in global health research.

Basic

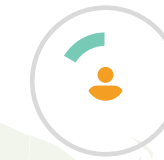
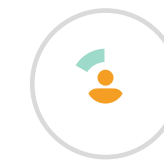
Know about and comprehend the above-mentioned values, norms, concepts, approaches and skills in global health research.

Skilled

Demonstrate commitment to and appropriately use and apply under supervision the above-mentioned values, norms, concepts, approaches and skills in the planning, design, conduct, evaluation and reporting of global health research.

Advanced

Independently demonstrate commitment to and apply, adapt, evaluate and further advance the above-mentioned values, norms, concepts, approaches and skills in the planning, design, conduct, evaluation and reporting of global health research, and foster these practices in others at individual and collective level.



Annex 1: Additional Methods

This project builds on interlinked work packages to underpin and inform the development of the competency catalogue for global health research at postgraduate level.

Work Package 1: Mapping of global health competencies in literature

A systematic mapping of key competencies for global health research described in the literature was conducted. The database search and text screening resulted in 84 articles being included. Data extraction was conducted in a two-stage process. During the **first extraction stage**, key information related to competencies were extracted from each article and the article was rated for relevance (High, Medium, Low) by two reviewers. Discrepancies were resolved by a third reviewer, resulting in 40 articles deemed high relevance. The second extraction stage involved obtaining in-depth information from these 40 high-relevance articles supported by AI-powered features of the Microsoft Edge browser. As a first step, the AI-tool was prompted to extract data on competencies or skills related to global health research and the educational strategies used to teach these competencies. The review team developed prompting questions informed by the conceptual frameworks underpinning the work, and the questions and process for AI-based extraction were piloted and adjusted. The same questions and extraction process were then run for each of the 40 articles on two different laptops at separate times, and the two sets of extracted data were then merged.

The result was a detailed description of extracted data on competencies and educational strategies for each of the 40 high-relevance articles.

This data was then uploaded, coded and analysed using Atlas.ai. Two reviewers conducted a first round of data analysis with interim coding of 20 articles each using a preliminary coding framework. Nine categories with various subdomains were identified, being seven competency domains, one category describing didactic and pedagogical approaches, and a miscellaneous category with details relevant for specific disciplinary fields of global health (research). Informed by this, the review team refined the coding framework and applied it in a second round of analysis to code the 40 files (with the two reviewers swapping and recoding the other's 20 files). A descriptive summary of the results of the analysis for each code and subcode was written including references to the 40 articles. In the final step, the accuracy of these AI-supported results was evaluated in detail by a separate researcher. The findings and each citation were cross-checked with the manually extracted data (first extraction stage) and, where necessary the original article, making corrections or adjustments (e.g. to address loss of conceptual specificity) in discussion with the core review team. These codes and themes provided valuable orientation, structure and content that was fed into the draft catalogue of competencies in Work Package 2, but were not necessarily directly established as competency domains and subdomains.

Work Package 2: Development of preliminary proposal for the competency catalogue

The second work package consisted of several activities to inform the development of a preliminary proposal for the competency catalogue. These activities are summarised briefly here, with more information available via request (interim reporting to GLOHRA). Firstly, the data and outputs from the GLOHRA Academy project to develop a repository of training offers (see details) were re-analysed to identify findings relevant to global health research competencies and the competency catalogue. Relevant information from the interim and final reports from the repository project were synthesised and, with participant consent, the data from the seven semi-structured key informant interviews with global health researchers were reanalysed.

Secondly, the project team conducted a mapping of other competency catalogues and models. A priority set of ten catalogues and other conceptual modules related to competencies for global health and global health research were selected and analysed, to identify for each model the: specific focus; structure and content (levels, domains, types and titles of competencies and sub-competencies); intended stage/level of skill; and relevant theories and methods drawn upon and used, among other information.

Informed by the above, the project team conceptualised the first draft of the Catalogue of Competencies for global health research. Based on the recommendation from the GLOHRA Academy, the structure of the Catalogue of Competencies is based on and adapted from the **PhD Competence Model**. This model was collectively designed by the Dutch University Medical Centers in 2016³ and with current version from September 2017 used, for example, by the Graduate School of Life Sciences at Utrecht University (see details) and Amsterdam UMC (see details).

This PhD Competence Model contains a set of six core competencies every PhD candidate should have, emphasising academic research and teaching skills, personal development and career orientation. For the purposes of the Catalogue of Competencies for global health research, the six core competency domains were adapted or replaced based on the findings from the activities outlined above. Relevant sub-competencies and terminology were considered for the draft competency catalogue.

Furthermore, the catalogue draws in an intersecting way from two other key competency frameworks. Firstly, the three levels of competency acquisition (Awareness; Proficiency; and Mastery) were drawn from Calhoun et al (2005) in their "Competency Mapping and Analysis for Public Health Preparedness Training Initiatives", which was used by the CDC and is widely cited.⁴ This was adapted from the **Dreyfus & Dreyfus Five-Stage Model of Skill Acquisition** (Novice, Advanced Beginner, Competency, Proficiency and Expertise).⁵ For this catalogue and following the consultation, it was decided to have three levels (Basic, Skilled and Advanced), as this terminology is already in use as part of other initiatives by the GLOHRA Global Health Academy (e.g. [GLOHRA Training Certificate](#) and [Innovative Training Offers](#)).

Secondly, Bloom's taxonomy of educational objectives and assessment⁶ was drawn from to inform the selection language used to reflect these levels of progressive competency development, as indicated by action verbs – i.e. actionable and ideally measurable statements for each competency domain and competency. For example, Bloom's taxonomy includes six categories in the cognitive domain (Knowledge; Comprehension; Application; Analysis; Synthesis; and Evaluation) and five categories in the affective domain (Receiving/attending; Responding; Valuing; Organisation; Characterisation by value or value complex). These categories and the corresponding terminology were considered in drafting the competencies.

Annex 2: Additional guidance

Note 1

Additional guidance related to Competency Domain 0. Readers are encouraged to consider how competencies related to a researcher’s main disciplinary background and anchor (Competency Domain 0) and competencies related to global health research (Competency Domains 1-7) will be relevant to and intersect with each other over the doctoral and postdoctoral journey. Based on this, readers should consider how the use of this Catalogue of Competencies might need to be adapted to reflect these important contextual and operational factors. Specifically, the relevance of, and process to progressively develop, specific global health research competencies will be strongly influenced by the disciplinary background, anchor(s) and context up to and during doctoral and postdoctoral level. As a simplified example, researchers from disciplines centred on mathematical and statistical competencies might find it easier to develop global health research competencies related to epidemiology compared to researchers from disciplines centred on words and constructivist knowledge. On the other hand, researchers from social and political science backgrounds will be able to build on existing competencies to understand and analyse societal relations, structures and power dynamics in relation to global health research, whereas researchers from the natural sciences are likely to have had less or little exposure to such theoretical and methodological approaches. Specific competency domains and competencies might also be more critical for researchers in some areas compared to others, or at different stages of their academic career or professional development. For example, the relevancy and application of competencies related to the responsible conduct of science in the field of global health will be very different for researchers working directly with communities in the field compared to researchers in a laboratory.

Note 2

Additional guidance related to Competency 1.2. **Social systems** in this catalogue refers to socio-technical or complex adaptive systems, comprising the large and growing number of actors, institutions, organisations, norms, and processes in the field of global health who are interconnected and interact in dynamic and complex ways.⁷ **Structures** are part of systems and include the organising features that bind actors and influence their interactions, which can be material or normative (e.g. rules, principles, norms) and which are closely related to the distribution of power and the creation of positions and hierarchies within the social system^{8,2} (e.g. the global health architecture^{9,10}).

Note 3

Additional guidance related to Competency 2.1. **Power** is understood as the ability to influence the thinking and/or actions of others (e.g. individuals, groups and organisations) as well as events, resources or outcomes.^{11,12} Power can take different forms (e.g. physical, economic, structural, institutional, moral, expertise, discursive, and network).¹¹ It can also derive from multiple sources (e.g. technical expertise, political power, bureaucratic power, financial power, networks and access, personal attributes), and can be visible/explicit as well as invisible/implicit.¹³ Positionality refers to a person’s social, cultural and political position in relation to others. Reflexivity is the process of critically reflecting on one’s own position, perspectives, practices, motives and biases within the research or social context and fosters/promotes researchers to acknowledge their positionality. This emphasis the relevance of power dynamics in affecting decision-making, knowledge production and relationships.¹⁴ There is increasing recognition of the need to build capacity to analyse and take action on issues of power and positionality, as part of efforts to address colonial legacies and epistemic injustice in the field of global health research.¹⁵

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