FGAI4H-Q-002

Douala, 06–09 December 2022

Source:	Chairman FG-AI4H	
Title:	Introduction to ITU/WHO Focus Group on AI for Health	
Purpose:	Information	
Contact:	Thomas Wiegand Chair, FG-AI4H Fraunhofer HHI Germany	E-mail: thomas.wiegand@hhi.fraunhofer.de

Abstract: This PPT contains an introduction to the ITU/WHO Focus Group on Artificial Intelligence for Health (FG-AI4H).

Introduction to the ITU/WHO Focus Group "Artificial Intelligence for Health"

FG-AI4H workshop and meeting „Q"
Douala, Cameroon 06–09 December 2022

Prof. Dr. Thomas Wiegand
Fraunhofer HHI & TU Berlin, Germany

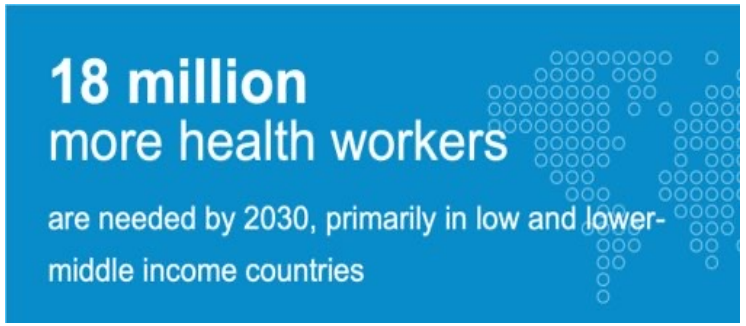
AI for Health
ITU-WHO Focus Group

World Health Organization

Funding support by:
fondation BOTNAR

Potential of artificial intelligence (AI) as digital health technology

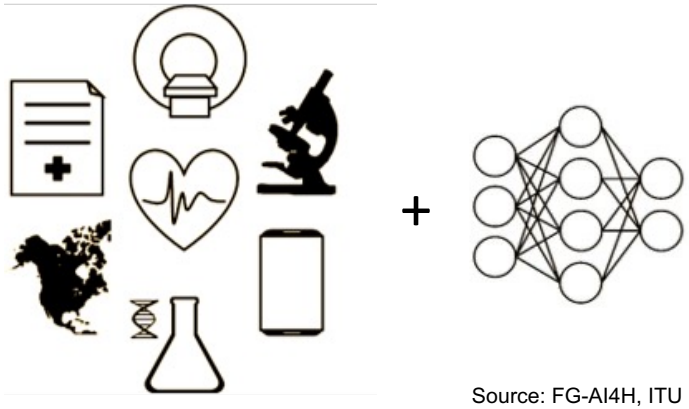
Source: PubMed



Source: WHO

- **AI** can have a substantial positive **impact** on global health
- **Benefits** through automation with AI
  Examples: automated microscopy or MRI analysis, clinical decision support
- **Shortage** of qualified healthcare **professionals** globally especially in LMICs – extension of scope of practice

Challenges of AI as digital health technology

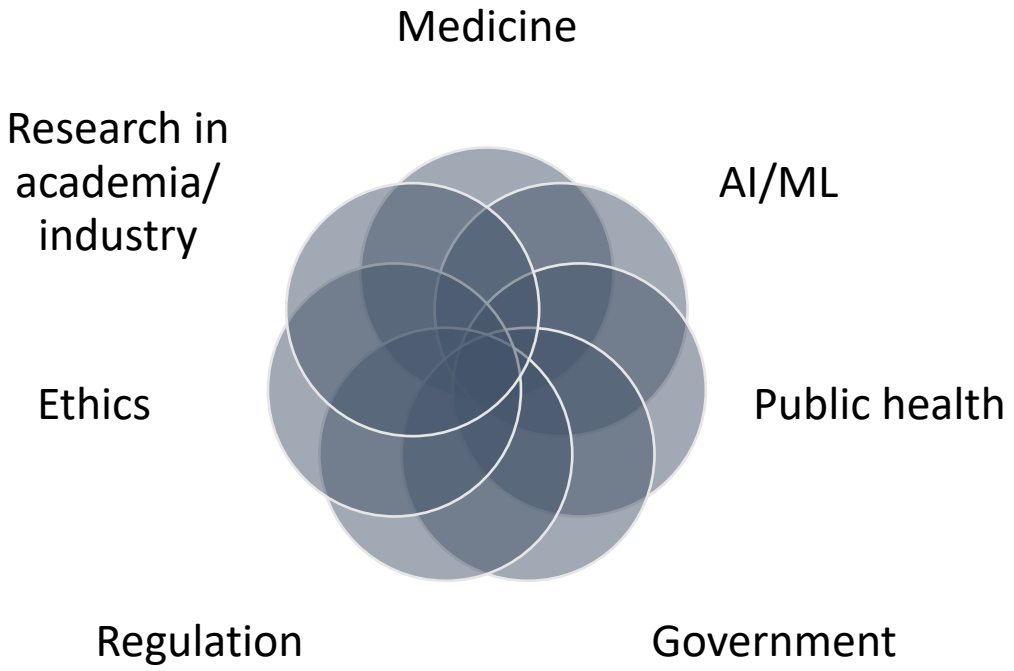


Source: FG-AI4H, ITU

Source: WHO

- **Quality assurance** of AI solutions through **assessment, ongoing evaluation & monitoring** required
- Progress is hampered by **lack of internationally accepted standards** to ensure **safe, effective, equitable application** of AI

Challenges of AI as digital health technology



Source: FG-AI4H

- Healthcare provision & regulation is a **multidisciplinary and complex** undertaking and requires **ongoing dialogue**

ITU/WHO Focus Group "AI for Health"

Source: ITU, WHO, UN

- The **aim** of FG-AI4H is to foster digital global health by:
  - documenting **best practices**,
  - establishing **standards**,
  - making **open-source software** available for the **independent assessment** of medical AI solutions
- In line with **WHO's Global Strategy on Digital Health** and United Nations' **Sustainable Development Goals**

About ITU/WHO Focus Group

- Members: Experts from around the globe
- Leadership:


Thomas Wiegand, FhG HHI & TU Berlin, Germany (chair)


Shan Xu, CAICT, China (vice-chair)


Stephen Ibaraki, ACM, Canada (vice-chair)


Naomi Lee, The Lancet, United Kingdom (vice-chair)


Sameer Pujari, WHO (vice-chair)


Manjula Singh, ICMR, India (vice-chair)


Ramesh Krishnamurthy, WHO (vice-chair)

Source: ITU

AI for Health
ITU-WHO Focus Group

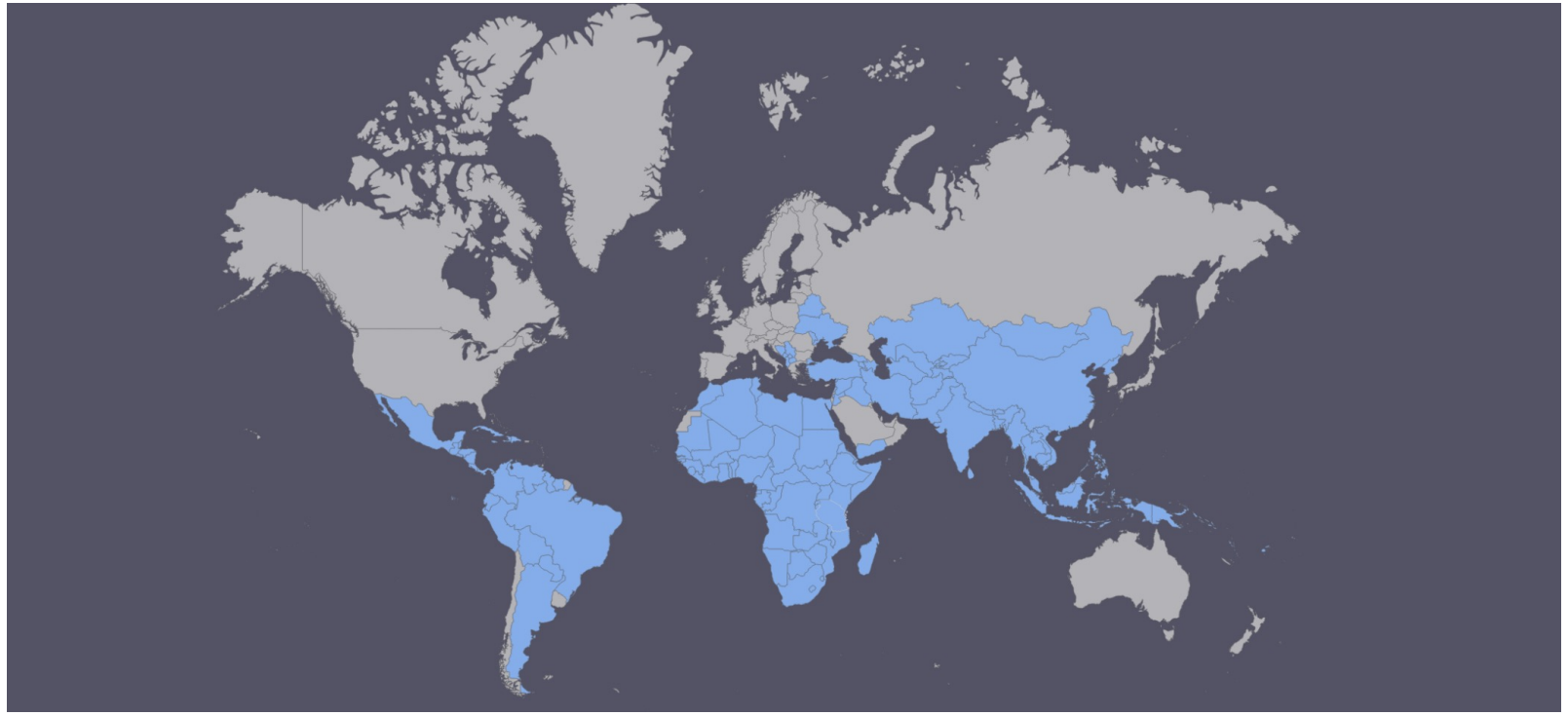
Starting a global dialogue on digital health & AI: FG-AI4H meetings & workshops

Source: ITU

5/2018 AI for Good Geneva
11/2018 Columbia University NYC
4/2019 World Expo Shanghai
9/2019 UCSAF Zanzibar
1/2020 PAHO/WHO Brasilia
5/2020 Online
1/2021 Online
9/2021 Online
05/2022 Berlin
12/2022 Douala

10/2018 WHO HQ Geneva
1/2019 EPFL Lausanne
5/2019 AI for Good Geneva
11/2019 ICMR & NICF New Delhi
~~3/2020 AI in Singapore~~
9/2020 Online
5/2021 Online
2/2022 Online
9/2022 Helsinki
03/2023 Harvard/MIT

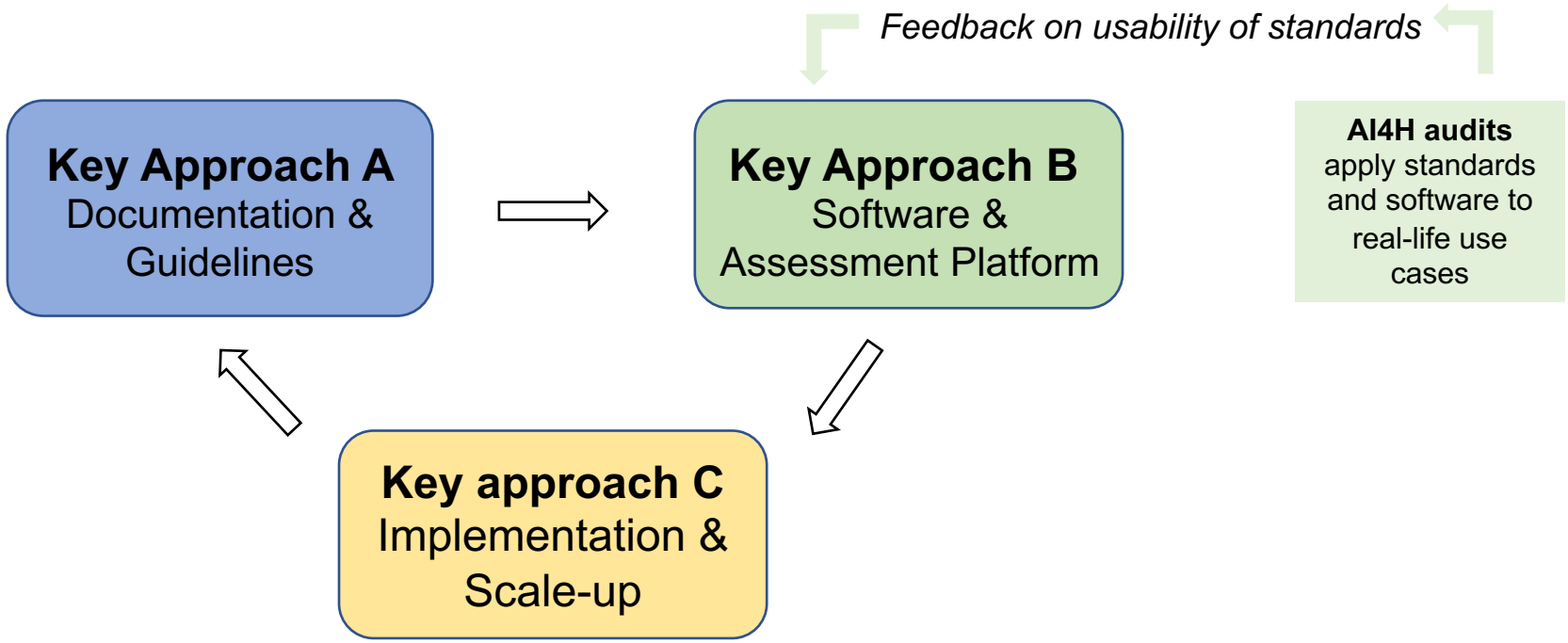
Include the global north and south



fondation BOTNAR

- Travel funds to workshops & meetings for experts from LMICs

ITU/WHO Focus Group Ecosystem



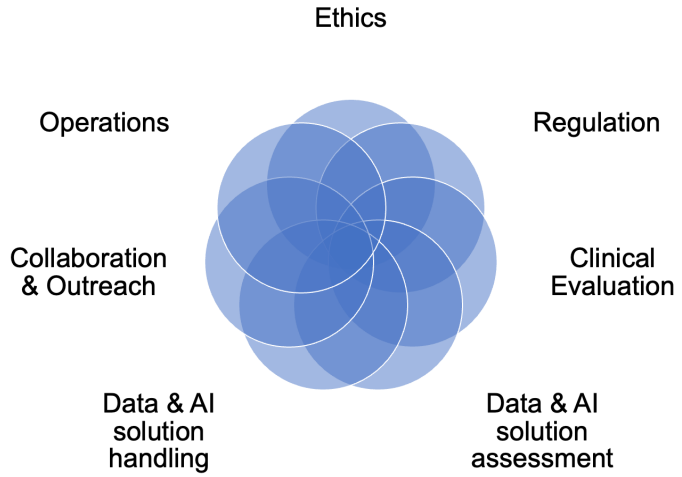
A) Creation of guidance documents & standards for AI4 health

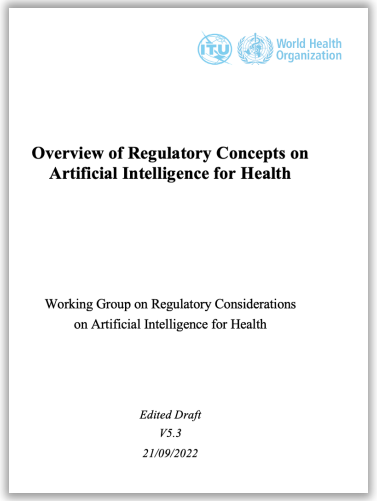
B) Open-source software for AI auditing, benchmarking, data annotation, sourcing

C) Global applicability and implementation of these standards (by FG-AI4H's WG-CO)

A – Documentation & Guidelines

WGs create guidance documents for AI-for-health




World Health Organization

Overview of Regulatory Concepts on Artificial Intelligence for Health

Working Group on Regulatory Considerations on Artificial Intelligence for Health

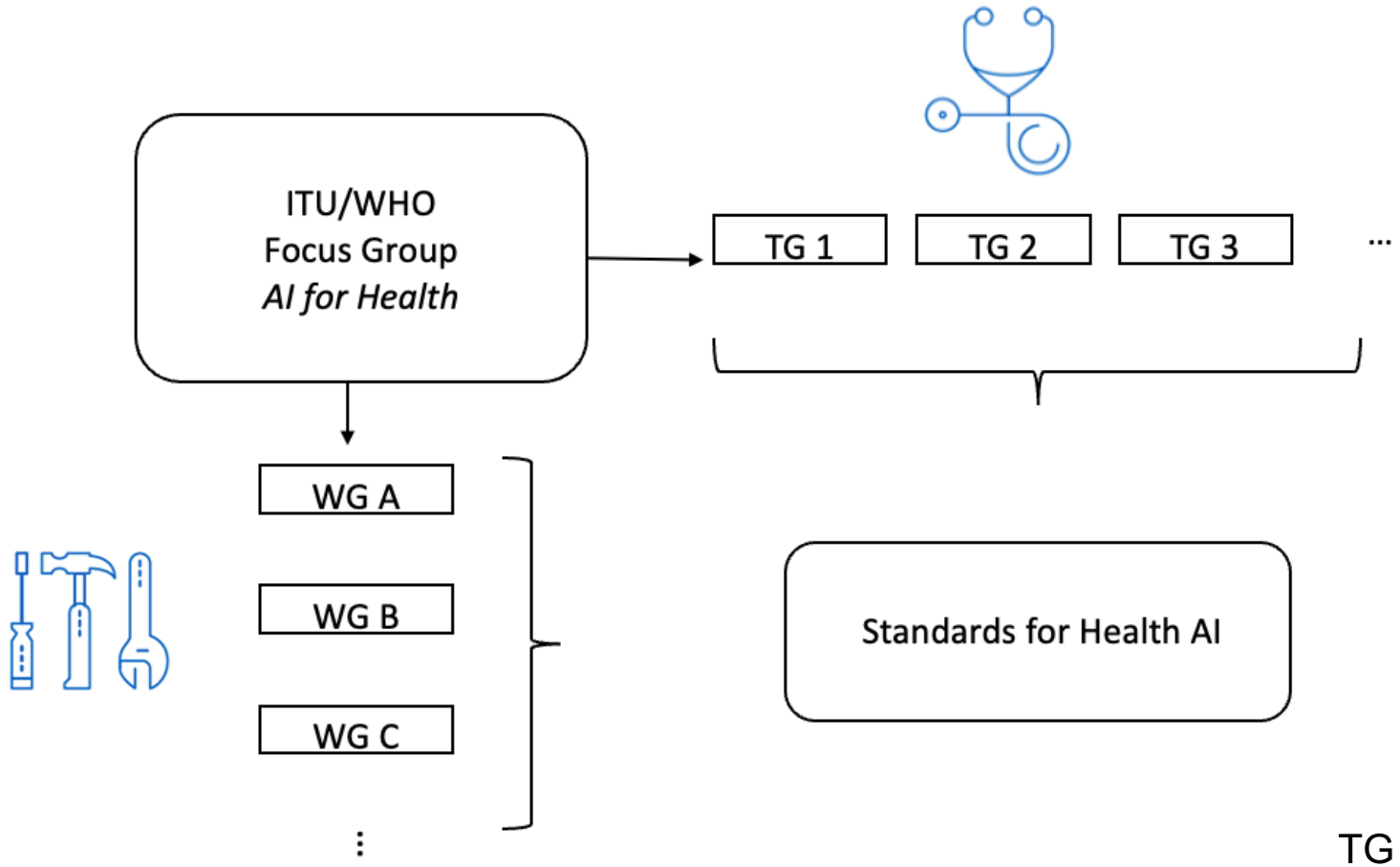
Edited Draft
V5.3
21/09/2022

Source: ITU

- **Working Groups (WGs)** are dedicated to **horizontal,** overarching matters
- Create **best practices & reference documents**
- Establish **processes** and related policies

A – Documentation & Guidelines

Matrix structure: working x topic groups



TG = topic group
WG = working group

A – Documentation & Guidelines

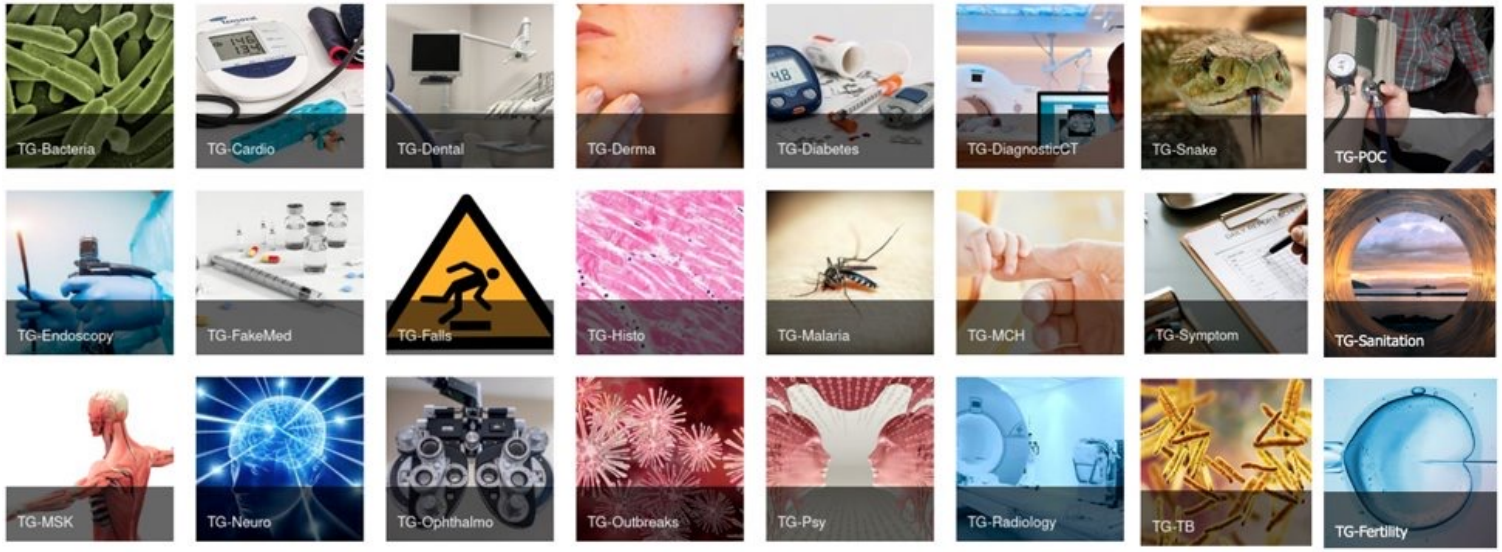
WGs create guidance documents for AI-for-health

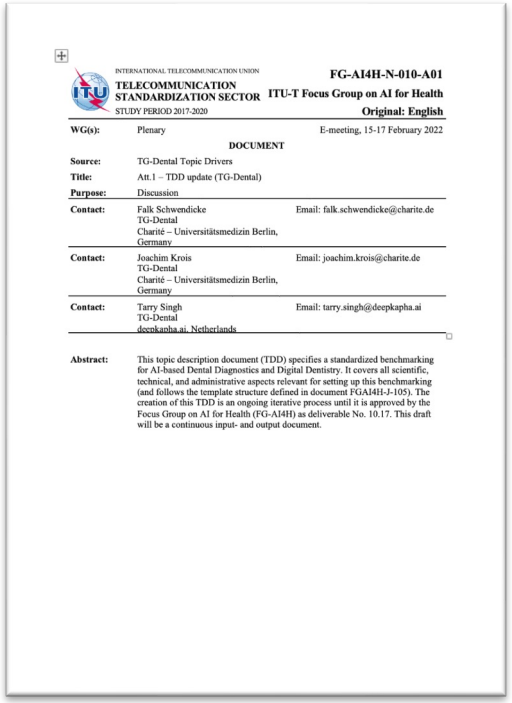
Source: WHO, https://www.who.int/publications/i/item/9789240029200

- **1000+ pages of standardization/guidance** documentation have been produced **by FG-AI4H**
- ***WHO ethics experts* published** 'Ethics and Governance of AI for health' in July '21
- **In the pipeline:**
  - *WG-Regulation*: Outline **key regulatory considerations**
  - *WG-Clinical Evaluation*: Developed a **framework** for **clinical evaluation for AI systems in health**

A – Documentation & Guidelines

TGs create benchmarking standards for AI-for-health





INTERNATIONAL TELECOMMUNICATION UNION
TELECOMMUNICATION STANDARDIZATION SECTOR
STUDY PERIOD 2017-2020

FG-AI4H-N-010-A01
ITU-T Focus Group on AI for Health
Original: English

WG(s):	Plenary	E-meeting, 15-17 February 2022

DOCUMENT

Source:	TG-Dental Topic Drivers	
Title:	Att.1 – TDD update (TG-Dental)	
Purpose:	Discussion	
Contact:	Falk Schwendicke TG-Dental Charité – Universitätsmedizin Berlin, Germany	Email: falk.schwendicke@charite.de
Contact:	Joachim Krois TG-Dental Charité – Universitätsmedizin Berlin, Germany	Email: joachim.krois@charite.de
Contact:	Tarry Singh TG-Dental deepkapha.ai, Netherlands	Email: tarry.singh@deepkapha.ai

Abstract: This topic description document (TDD) specifies a standardized benchmarking for AI-based Dental Diagnostics and Digital Dentistry. It covers all scientific, technical, and administrative aspects relevant for setting up this benchmarking (and follows the template structure defined in document FGAI4H-J-105). The creation of this TDD is an ongoing iterative process until it is approved by the Focus Group on AI for Health (FG-AI4H) as deliverable No. 10.17. This draft will be a continuous input- and output document.

Source: ITU

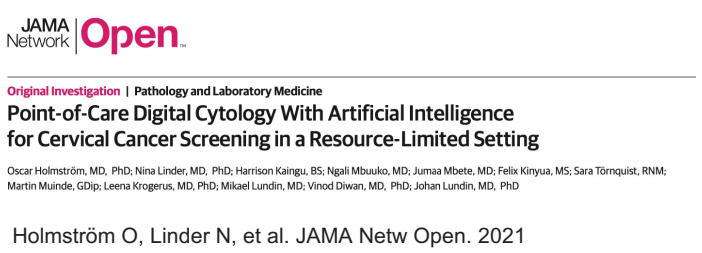
Topic groups (TGs) are dedicated to

- specific health use cases (24 by Dec '22)
- bringing together domain **experts** & **data**
- propose **procedures to benchmark** AI models for a given task within a health topic

A – Documentation & Guidelines
Topic Group Example: Point-of-Care

Slide processing, including staining bench and hood

Slide digitization equipment, including (1) laptop computer with access to the slide- management platform, (2) slide scanner, (3) mobile-network router, and (4) Papanicolaou test microscopy slide



JAMA Network Open

Original Investigation | Pathology and Laboratory Medicine

Point-of-Care Digital Cytology With Artificial Intelligence for Cervical Cancer Screening in a Resource-Limited Setting

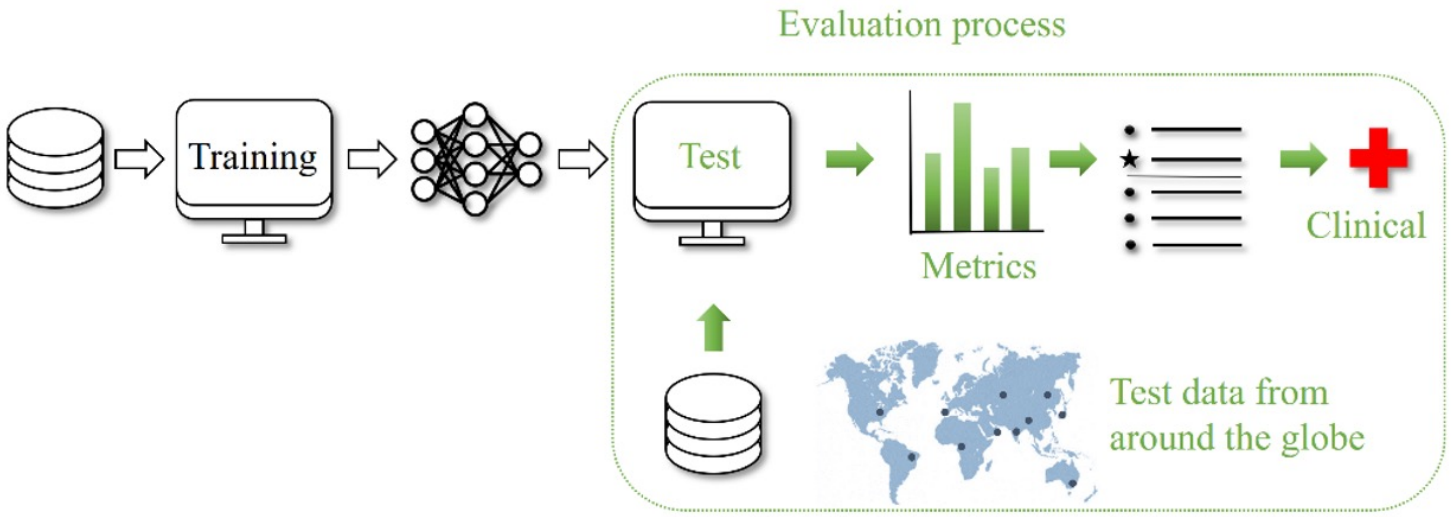
Oscar Holmström, MD, PhD; Nina Linder, MD, PhD; Harrison Kaingu, BS; Ngali Mbuuko, MD; Jumaa Mbete, MD; Felix Kinyua, MS; Sara Törnquist, RNM; Martin Muinde, GDip; Leena Krogerus, MD, PhD; Mikael Lundin, MD; Vinod Diwan, MD, PhD; Johan Lundin, MD, PhD

Holmström O, Linder N, et al. JAMA Netw Open. 2021

- **Mobile digital microscopy** in **resource-limited settings** for cervical cancer screening

Source: TG-POC, Nina Linder (Helsinki & Uppsala), Holmström O, Linder N, Kaingu H, et al. Point-of-Care Digital Cytology With Artificial Intelligence for Cervical Cancer Screening in a Resource-Limited Setting. JAMA Netw Open. 2021;4(3):e211740. doi:10.1001/jamanetworkopen.2021.1740

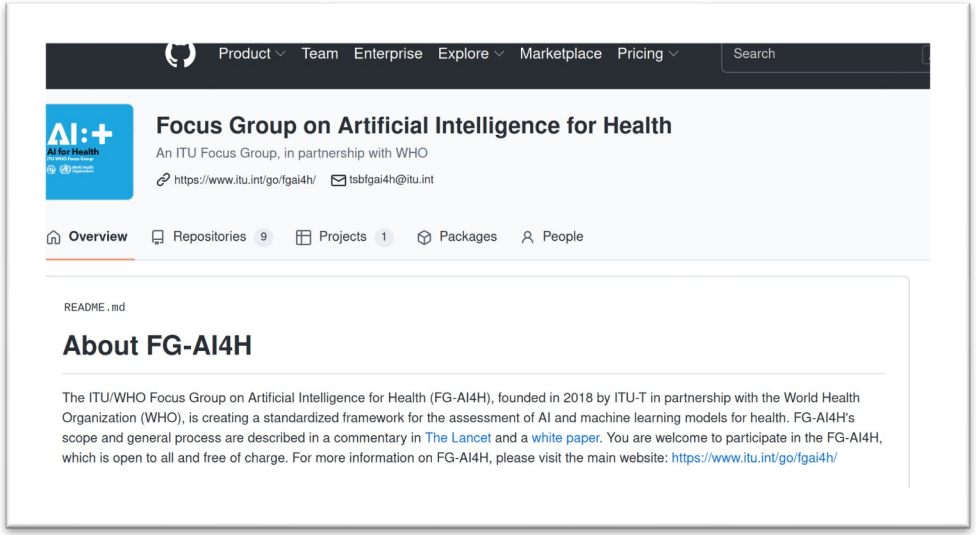
B – Software and assessment platform



Source: ITU Del. 7.0

- **Open code initiative** by FGAI4H's WG-DASH/WG-DAISAM: https://github.com/fg-ai4h
- Develop end-to-end **assessment/benchmarking platform** with **standardized test procedures** and **metrics** on high-quality, representative, undisclosed test data

B – Software and assessment platform

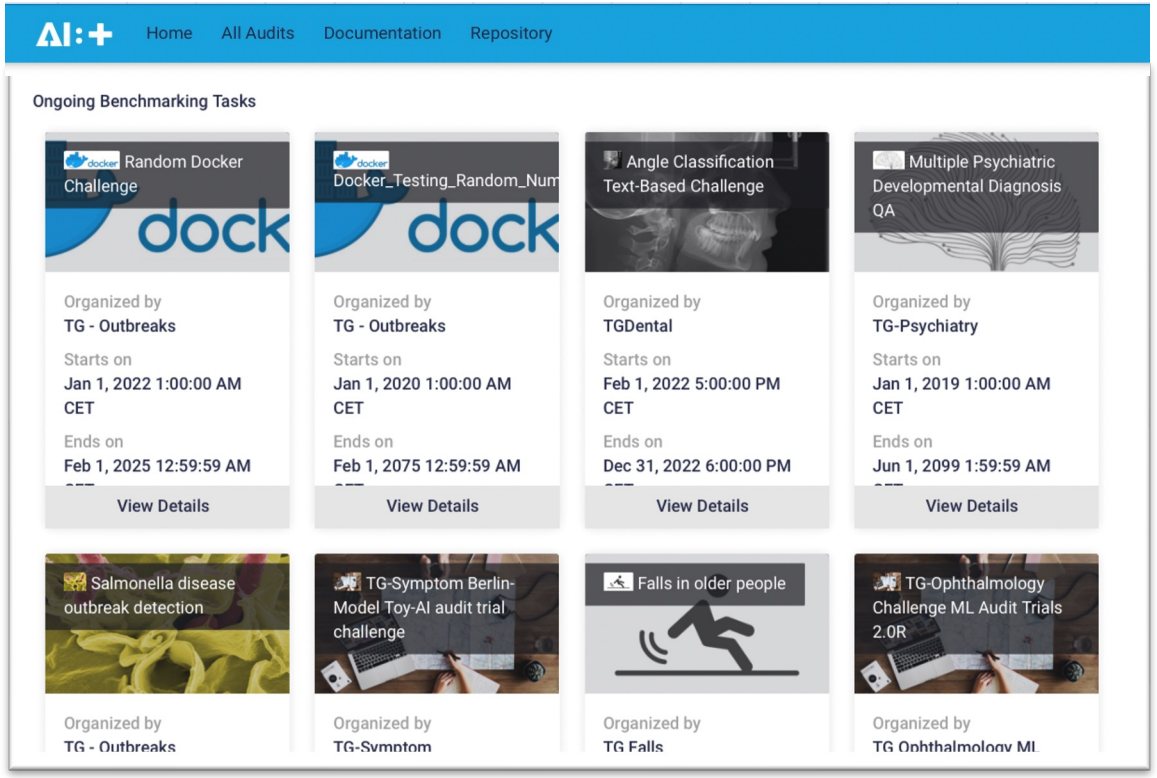


- Involve **developers**, **regulators**, **medical professionals** & develop **software tools** for:

Test data acquisition | **Test data storage** | **Test data annotation** | **AI predict-ion** | **Assessment of AI prediction** | **Report of results**

Source: https://github.com/fg-ai4h, FG-AI4H OCI

B – Software and assessment platform



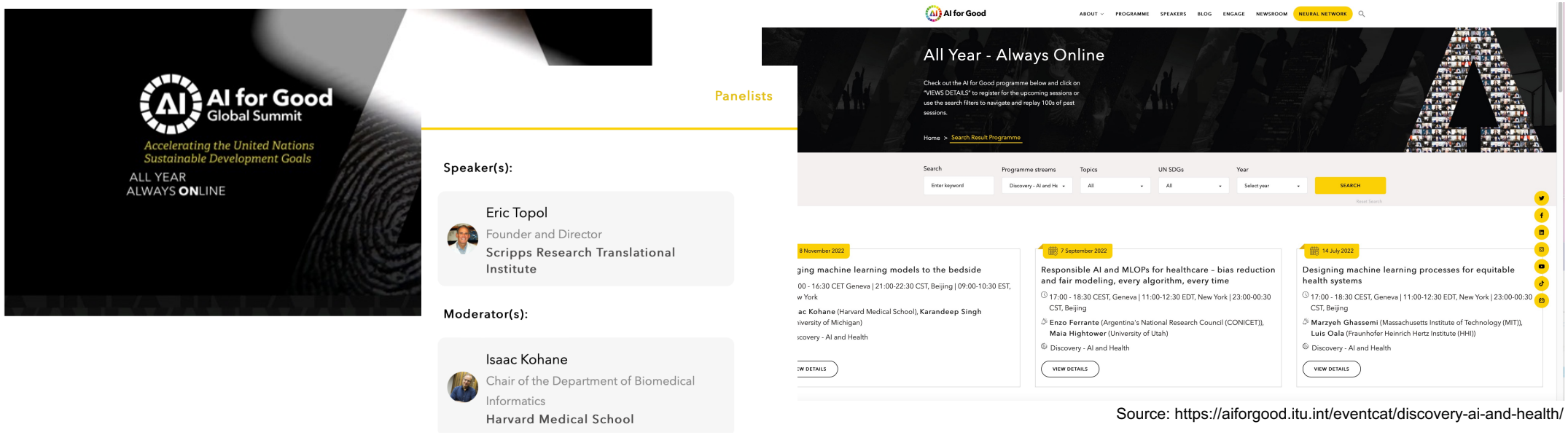
https://health.aiaudit.org/

AI auditing by FG-AI4H:

- Identify & define methods for **data & AI assessment**
- **Best practices** for AI auditing & quality control along entire AI life cycle
- **Verification & validation** of technical/clinical/regulatory/ethical requirements for AI following a structured audit process
- **Publications:**
  - ***ML4H auditing: From paper to practice***. *PMLR, 2020*. In Machine Learning for Health [Link]
  - ***ML for health: algorithm auditing & quality control***. Journal of medical systems, 2021 [Link]

Source: https://health.aiaudit.org/

C – Implementation and Scale-up
Outreach & collaboration on global health



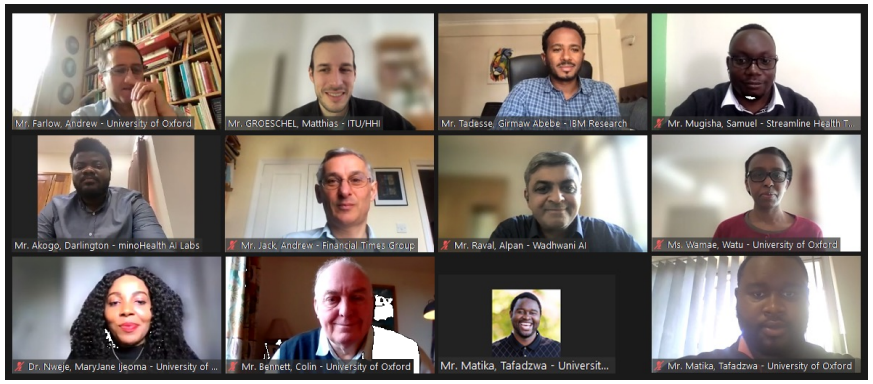
Source: https://aiforgood.itu.int/eventcat/discovery-ai-and-health/

- **Webinars**: > 20 webinars with >7000 views and renowned speakers e.g., **Isaac Kohane** (Harvard Medical School), **Regina Barzilay** (Massachusetts Institute of Technology, MIT), **Uri Shalit** (Technion - Israel Institute of Technology, Faculty of Industrial Engineering and Management), **Eric Topol** (Scripps Research Translational Institute), …

- **Workshops**: > 5 international workshops organized in collaboration with U of Oxford

all webinars: https://aiforgood.itu.int/eventcat/discovery-ai-and-health/

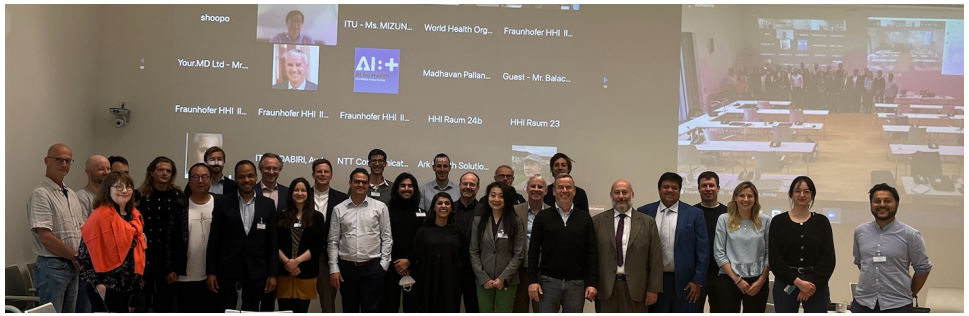
C – Implementation and Scale-up
Research on global health



Source: https://www.itu.int/en/ITU-T/focusgroups/ai4h/Documents/Digital%20Health%20and%20AI%20Report_19_March_2022.pdf; ITU

- Reports on (1) State of Digital Tools in Africa, (2) Catalyzing Innovation in **Global Health,** (3) **Equitable Data Sharing** (more info: link)
- Conceptualize and rethink how Hackathons in Global Health are conducted

FG-AI4H facilitates Digital Global Health



Source: ITU

- FG-AI4H identifies, promotes, co-develops, and **independently assesses** AI innovations in close collaboration with partners around the globe
- Ensures that AI solutions are conceived with a focus **on implementation** to create a **sustainable** impact & benefit
- Guidelines, standards and the open-source assessment platform by FG-AI4H can be **promising facilitators** of **Digital Global Health** innovation

Future Global Initiative on AI for Health

Output documents ready by March 2023

- Ethics and Governance of AI for Health
- Common unified terms
- Regulatory considerations
- Good practices for health applications of ML: Considerations for manufacturers and regulators
- Data annotation
- Clinical evaluation
- ...

2023: Transition to ITU/WHO Global Initiative on AI for Health

Enable

- Norms, guidance, standards
- Governance (regulation, ethics)
- Surveillance, research and evidence
- Data sharing

Facilitate

- Knowledge sharing between countries
- Cooperation between all stakeholders
- Pool funding

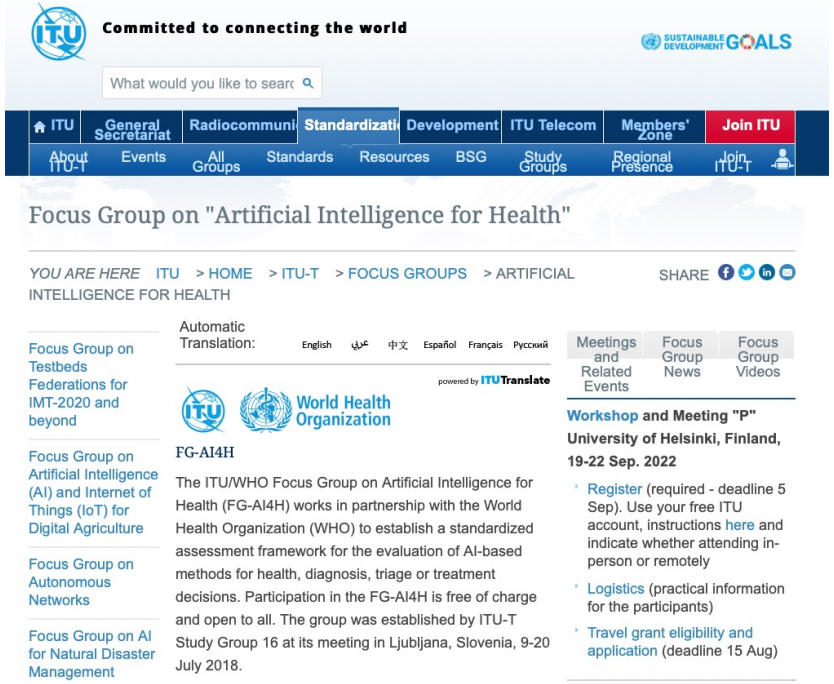
Implement

- Scale program in countries
- Capacity building for AI for health programs
- Build sustainability models

Publications

- **WHO and ITU establish benchmarking process for AI in health**. *The Lancet*, 2019. https://doi.org/10.1016/S0140-6736(19)30762-7
- **Whitepaper for the ITU/WHO Focus Group on AI for Health**, *FG-AI4H*, 2020. https://itu.int/go/fgai4h/whitepaper
- **Toward global validation standards for health AI**. *IEEE CSM*, 2020. https://doi.org/10.1109/MCOMSTD.001.2000006
- **ML4H auditing: From paper to practice**. *PMLR*, 2020. In Machine Learning for Health [Link]
- **ML for health: algorithm auditing & quality control**. Journal of medical systems, 2021, https://doi.org/10.1007/s10916-021-01783-y
- **Full documentation** on http://itu.int/go/fgai4h/collab

Get involved!



- Visit https://www.itu.int/go/fgai4h/
- Join FG-AI4H activities
- Contact: tsbfgai4h@itu.int

Join next FG-AI4H meeting
Harvard/MIT & online, March ‘23