INTERNATIONAL TELECOMMUNICATION UNION

TELECOMMUNICATION STANDARDIZATION SECTOR

STUDY PERIOD 2022-2024

FGAI4H-P-015-A02

ITU-T Focus Group on AI for Health

Original: English

WG(s):	Plen	Helsinki, 20-22 September 2022

DOCUMENT

Source:	TG-MCH Topic Driver	
Title:	Att.2 – CfTGP (TG-MCH) [same as Meeting H]	
Purpose:	Engagement	
Contact:	Raghu Dharmaraju, Hafsa Mwita Wadhwani AI, India; Zanzibar University, Tanzania	Email: rdharmaraju@gmail.com, hafsa.m.mwita@gmail.com

Abstract:	Calling on members of the medical and artificial intelligence communities with a vested interest in "Maternal & Child Health". Become engaged in the group dedicated to establishing a standardized benchmarking platform for "AI for Maternal & Child Health" within the International Telecommunication Union (ITU)/World Health Organization (WHO) Focus Group on "Artificial Intelligence for Health" (FG- AI4H).
	This version of the CfTGP is the same as seen in Meeting H (FGAI4H-H-015-A02), reproduced for easier reference as a Meeting N document.

ITU/WHO Focus Group on artificial intelligence for health (FG-AI4H)

Call for Topic Group Participation: AI for Maternal & Child Health

The International Telecommunication Union (ITU)/World Health Organization (WHO) Focus Group on "Artificial Intelligence for Health" (FG-AI4H; https://itu.int/go/fgai4h) seeks engagement from members of the medical and artificial intelligence (AI) communities (including clinicians, technologists, entrepreneurs, potential benchmarking data providers, machine learning experts, software developers, researchers, regulators, policy-makers, companies/institutions, and field experts) with a vested interest in shaping the benchmarking process of AI for Maternal & Child Health.

1   About FG-AI4H

Over the past decade, considerable resources have been allocated to exploring the use of AI for health, which has revealed an immense potential. Yet, due to the complexity of AI models, it is difficult to understand their strengths, weaknesses, and limitations. If the technology is poorly designed or the underlying training data are biased or incomplete, errors or problematic results can occur. AI technology can only be used with complete confidence if it has been quality controlled through a rigorous evaluation in a standardized way. Towards developing this standard assessment framework of AI for health, the ITU has established FG-AI4H in partnership with the WHO.

Thus far, FG-AI4H has established 18 topic groups. The topic groups are: AI and cardiovascular disease risk prediction, dermatology, falls among the elderly, histopathology, neuro-cognitive disorders, outbreak detection, ophthalmology (retinal imaging diagnostics), psychiatry, snakebite and snake identification, symptom assessment, tuberculosis, volumetric chest computed

tomography, diagnoses of bacterial infection and anti-microbial resistance, dental diagnostics and digital dentistry, AI-based detection of of falsified medicine, malaria detection, maternal and child health and radiotherapy.

Each topic group agrees upon representative benchmarking tasks in a pragmatic, best-practice approach, which can later be scaled and expanded to similar tasks. Every benchmarking task should address a health problem of relevance (e.g. impacting a large and diverse part of the global population or challenging to treat) and for which AI technology would provide a tangible improvement relative to the current practice (e.g. better care, results, and/or cost/time effectiveness).

For a rigorous and sound evaluation, undisclosed test data sets must be available (or have to be collected) for each task. All data must be of high quality and compliant with ethical and legal standards. In addition, the data must originate from a variety of sources so that it can be determined whether an AI algorithm can generalize across different conditions, locations, or settings (e.g. across different people, hospitals, and/or measurement devices). The format/properties of the data serving as input to the AI and of the output expected from the AI, as well as the benchmarking metrics are agreed upon and specified by the topic group.

Finally, the AI-to-be-evaluated will be benchmarked with the undisclosed test data on FG-AI4H computing infrastructure. Here, the AI will process single samples of the undisclosed test data set and predict output variables, which will be compared with the "ground truth." The results of the benchmarking will be provided to the AI developers and will appear on a (potentially anonymized) leaderboard.

2   Topic group: AI for Maternal & Child Health

A topic group is a community of stakeholders from the medical and AI communities with a shared interest in a topic. The objectives of the topic groups are manifold:

1.   to provide a forum for open communication among various stakeholders,

2.   to agree upon the benchmarking tasks of this topic and scoring metrics,

3.   to facilitate the collection of high-quality labelled test data from different sources,

4.   to clarify the input and output format of the test data,

5.   to define and set-up the technical benchmarking infrastructure, and

6.   to coordinate the benchmarking process in collaboration with the Focus Group management and working groups.

The primary output of a topic group is one document that describes all aspects of how to perform the benchmarking for this topic. (The document will be developed in a cooperative way by suggesting changes as input documents for the next FG-AI4H meeting that will then be discussed and integrated into an official output document of this meeting. The process will continue over several meetings until the topic description document is ready for performing the first benchmarking.)

This topic group is dedicated to AI for Maternal & Child Health.

Improving the health and well-being of mothers, infants, and children is one of the most important public health goals worldwide. Every day, an estimated number of 810 women die from causes related to pregnancy or childbirth and over 15,000 children die from preventable diseases. Malnourished children, particularly those with severe acute malnutrition, have a higher risk of death from common childhood illness such as diarrhoea, pneumonia, and malaria. Nutrition-related factors contribute to about 45% of deaths in children under-5 years of age. Current trends predict that 52 million children under 5 will die between 2019 and 2030. Almost half of these under-five deaths will be newborns whose deaths could be prevented by providing high quality antenatal care,

skilled care at birth, postnatal care for mothers and their babies, and care of small and sick newborns. 94% of maternal deaths and over 80% of under-5 deaths occur in low and lower middle-income countries.

AI as a tool in maternal and child health care will benefit individuals and communities across the world, especially in low-resource settings. Some examples of potential AI-based applications in this area include:

i. Pregnancy risk estimation and stratification: Algorithms that predict a pregnant woman's risk of developing complications or having adverse pregnancy outcomes in order to identify high-risk pregnancies

ii. Early warning systems for labour rooms and neonatal intensive care units

iii. Health screening tools: Smartphone-based tools to screen for common diseases such as pneumonia, jaundice, anaemia, etc

iv. Growth monitoring: Smartphone-based tools to screen newborns, infants and children for low birth weight, inadequate growth and development, and malnutrition

In developing countries, the burden of service delivery of health services pertaining to maternal and child health falls on frontline health workers, who have limited skills and training and are often overworked and underpaid. In this scenario, AI can help close the expertise gap and lead to better monitoring and accountability by enabling easy, accurate and tamper-proof screening.

While there are several research and commercial groups working on AI applications in this area, the lack of consistent standardization makes it difficult for organisations like the WHO, governments, and other key players to adopt symptom assessment systems as part of their solutions to address global health challenges. The implementation of a standardised benchmarking for these classes of applications as part of the WHO/ITU's AI for Health Focus Group will therefore be an important step towards addressing this issue.

The initial focus of this topic group will be growth monitoring (from birth to early adolescence), followed by other classes of algorithms, such as those for pregnancy risk stratification. To create a standardized benchmarking, the topic group will consider all relevant aspects. In addition to the aforementioned general objectives, this will include more topic specific questions like:

- What are the right datasets to be created to benchmark growth monitoring tools?
- What are the variations and diversities (of subjects and settings) that these datasets must capture?
- How might these datasets be created? Are there existing datasets that meet these needs?
- How to set up benchmarking in a way that protects the intellectual property of the AI contributors, the rights of the data providers, and is still transparent?
- What should the first minimal viable benchmarking look like and how can this be refined over time to eventually cover all relevant aspects?

All aspects will be discussed during regular focus group meetings and incorporated in the corresponding topic description document for this topic group.

More details about the activities of the topic group can be found in the forthcoming topic description document, which can be accessed with a free ITU account (cf. "Get involved").

Current members of the topic group include Raghu Dharmaraju, Vice-President of Products & Programs, Wadhwani Institute for Artificial Intelligence (Wadhwani AI) and Hafsa Mwita from University of Zanzibar. Wadhwani AI is an independent, non-profit applied research institute and innovation hub working on developing AI solutions for social good.

The topic group would benefit from further expertise of the medical and AI communities and from additional data. In particular we want to invite groups that are working with child growth monitoring data (such as labelled images or longitudinal datasets, etc)

3   Get involved

To join this topic group, please send an e-mail to the focus group secretariat (tsbfgai4h@itu.int) and the topic driver (raghu@wadhwaniai.org). Please use a descriptive e-mail subject (e.g. "Participation topic group AI for AI for Maternal & Child Health"), briefly introduce yourself and your organization, concisely describe your relevant experience and expertise, and explain your interest in the topic group.

Participation in FG-AI4H is free of charge and open to all. To attend the workshops and meetings, please visit the Focus Group website (https://itu.int/go/fgai4h), where you can also find the whitepaper, get access to the documentation, and sign up to the mailing list.

_____