|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ITU Logo | INTERNATIONAL TELECOMMUNICATION UNION  **TELECOMMUNICATION STANDARDIZATION SECTOR**  STUDY PERIOD 2017-2020 | | FG-AI4H-G-101-R01 | |
| **ITU-T Focus Group on AI for Health** | |
| **Original: English** | |
| **WG(s):** | | Plenary | New Delhi, 13-15 November 2019 | |
| **DOCUMENT** | | | | |
| **Source:** | | FG-AI4H | | |
| **Title:** | | Report of the 7th meeting (Meeting G) of the Focus Group on Artificial Intelligence for Health (New Delhi, 13-15 November 2019) | | |
| **Purpose:** | | Admin | | |
| **Contact:** | | Thomas Wiegand Fraunhofer HHI Germany | | Email: [thomas.wiegand@hhi.fraunhofer.de](mailto:thomas.wiegand@hhi.fraunhofer.de) |

|  |  |
| --- | --- |
| **Abstract:** | This document contains the report of the seventh meeting of the ITU-T Focus Group on Artificial Intelligence for Health (FG-AI4H), held in New Delhi, 13-15 November 2019. Revision 1 corrects affiliation mistakes by the secretariat. |

Executive summary

* Agreed to rename TG-Cogni (Neuro-cognitive diseases) as TG-Neuro "Neurological disorders". The neuro-cognitive diseases use case becomes a sub-topic group within TG-Neuro.
* Agreed to cover the AI based Parkinson's disease screening and management use case as a sub-topic group within the TG-Neuro (ex TG-Cogni). The sub-topic is led by Khondaker Abdullah Al Mamun ([mamun@cse.uiu.ac.bd](mailto:mamun@cse.uiu.ac.bd)), AIMS Lab, United International University, (Bangladesh).
* Agreed to create a new topic group on dental diagnostics and digital dentistry (TG-Dental), topic drivers are Falk Schwendicke ([falk.schwendicke@charite.de](mailto:falk.schwendicke@charite.de)) and Joachim Krois ([joachim.krois@charite.de](mailto:Joachim.krois@charite.de)), Charité Berlin (Germany).
* Agreed to create a new TG-FakeMed (AI-based detection of falsified medicine) with Francke Verzefé ([fverzefe@gmail.com](mailto:fverzefe@gmail.com)), TrueSpec-Africa (DRC), as topic driver.
* After discussions at the workshop, it was agreed to rename the TG-Growth (Child growth monitoring) as TG-MCH (Maternal and child health), with Raghu Dharmaraju ([rdharmaraju@gmail.com](mailto:rdharmaraju@gmail.com)), Wadhwani AI (India), as the TG Driver.
* Defined list of deliverables for the FG, as found in [FGAI4H-G-200-R02](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-200-R02.docx). The editors for the initial draft of those deliverables were identified and tasked with producing an abstract and initial table of contents by 2 December 2019.
* Agreed that two new working groups would be created as soon as practical, WG on Clinical Evaluation (WG-CE) and WG on Ethics (WG-Ethics). They will be listed on the main FG-AI4H webpage as "in preparation".
* Agreed to close the Working Group on Health requirements (WG-HR).
* Output documents:
* [FGAI4H-G-102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-102.docx): Updated call for proposals: use cases, benchmarking, and data

* [FGAI4H-G-107](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-107.docx" \t "_blank): Onboarding document for the FG-AI4H
* [FGAI4H-G-200-R02](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-200-R02.docx): List of planned FG-AI4H deliverables

The meeting had 211 participants over the various days and reviewed 41 documents (not counting attachments).

A list of the 19 decisions taken at the meeting is found in Annex E of the report.

**CONTENTS**

1 Opening 4

2 Approval of agenda 4

3 Documentation and allocation 4

4 IPR 4

5 Management updates 4

6 Approval of Meeting F outcomes and updates 4

7 Outcome of the workshop 5

8 Review of incoming liaison statements 5

9 FG-AI4H deliverables 5

10 Horizontal and strategic topics 8

11 Working Group updates 8

11.1 Data and AI solution assessment methods (WG-DAISAM) 8

11.2 Data and AI solution handling (WG-DASH) [Marc Lecoultre; Ferhat Kerif] 9

11.2.1 Progress report 9

11.2.2 Requirements for app for collective data acquisition and data annotation 9

11.3 Operations (WG-O) 10

11.4 Regulatory considerations on AI for health (WG-RC) 10

11.5 Health requirements (WG-HR) 10

11.6 Ethics 11

11.7 Clinical evaluation 12

12 Updates and new proposals for existing TGs 12

12.1 TG-Cardio (Cardiovascular risk prediction) 12

12.2 TG-Cogni (Neurocognitive diseases) 13

12.3 TG-Bacteria (Diagnoses of bacterial infection and anti-microbial resistance) 13

12.4 TG-Derma (Dermatology) 13

12.5 TG-DiagnosticCT (Volumetric chest computed tomography) 14

12.6 TG-Falls (Falls among the elderly) 14

12.7 TG-Histo (Histopathology) 14

12.8 TG-Ophthalmo (Ophthalmology) 14

12.9 TG-Outbreaks (AI for outbreak detection) 15

12.10 TG-Malaria (Malaria detection) 16

12.11 TG-Psy (Psychiatry) 16

12.12 TG-Radiotherapy (Radiotherapy) 16

12.13 TG-Snake (Snakebite and snake identification) 17

12.14 TG-Symptom (Symptom assessment) 17

12.15 TG-TB (Tuberculosis) 17

12.16 TG-Growth (Child growth monitoring) 17

13 Proposals for new topic areas 18

13.1 Dental diagnostics 18

13.2 AI-based detection of falsified medicine\* 18

13.3 Radiograph-agnostic framework and platform 19

13.4 Dengue surveillance 19

13.5 Universal health coverage 20

13.6 Parkinson's disease detection 20

14 Review / reconfirmation of previous output documents 20

15 Outcomes of this meeting 21

15.1 New / extended / completed WGs 21

15.2 New TGs 21

15.3 Output documents 21

16 Future work 21

16.1 Schedule of future FG meetings and workshops 21

16.2 Work plan and timeline 22

16.3 Interim activities (online) 22

17 Promotion and outreach 22

18 A.O.B. 22

19 Closing 22

Annex A Agenda 23

Annex B: Documentation 26

Annex C: List of participants 31

Annex D Summary of FG-AI4H resources 40

Annex E Summary of decisions 43

# Opening

The meeting was opened with various addresses from the host organization:

* Devendra Kumar Nim, Deputy Director General, NICF. Noted that AI for telehealth is a topic of interest for India and requested more participation from developing countries.
* Manish Sinha, Director General, NICF. Noted the significant growth of connectivity in India using wireless technology, which makes network operators interested on data and related applications, e.g. big data, AI, and data for health and education. Reliability, accountability, trust in AI remain important areas that need to be addressed.
* Thomas Wiegand, Chairman, FG. He thanked for having the FG in New Delhi. Happy to help cross-sector exchanges between the ICT and health sectors. AI in health has the potential to improve the lives of people but also doctors, nurses and other healthcare workers. Transferred to online cooperation mode from physical participation. Yesterday had many remote participants.
* P.K. Sinha, Chief Guest, Member Finance, Digital Communication Commission, India. He noted that the discussions here be useful to the whole of humanity
* Julia Mohapatra, Deputy Director General, NICF. Warm thanks the FG having agreed to come to NICF for this meeting. We are one family and would like to help the whole world. Should emphasize need for women’s health.

# Approval of agenda

The agenda in [G-001](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-001.docx) (Agenda) was approved and the initial timing in its Annex C was noted, with two revisions issued during the meeting. The final agenda is found in Annex [A](#AnnexA).

# Documentation and allocation

The list of documents and allocation (also in [G-001](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-001.docx)) was adopted. The final list of documents is found in Annex [B](#AnnexB).

# IPR

The text in [G-001](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-001.docx) Annex A was read and no declarations were made at the meeting. It was highlighted that the IPR question should be asked periodically under the various TG (e-)meetings, since many of participants in those may not be attending the FG-AI4H Plenary meetings.

1. TG Drivers are asked to read the IPR call as found in [G-001](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-001.docx) Annex A and collect any declarations of made in return to the IPR question in their meeting minutes.

# Management updates

No management updates done at this meeting, other than the ceasing roles in consequence of the closure of WG-HR (see §11.5).

# Approval of Meeting F outcomes and updates

The meeting report of the Zanzibar meeting in [F-101](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-101.docx) was approved without comments.

The following four documents were noted by the meeting:

Available at the Zanzibar meeting:

* [F-102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-F-102.docx): Updated Call for Proposals: Use Cases, Benchmarking and Data
* [F-106](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-F-106.docx): Guidelines on FG-AI4H online collaboration tools

Approved by remote consensus after the Zanzibar meeting:

* [F-103](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-F-103.docx): Updated FG-AI4H data acceptance and handling policy
* [F-105](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-F-105.docx): ToRs for the WG-Experts and call for experts

# Outcome of the workshop

The slide set in [G-002-R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-002-R01.pptx) with a summary of the Workshop on 12 Nov. was introduced by the FG-AI4H chairman. The document was noted. All presentations and the recording of the sessions are found at <https://itu.int/en/ITU-T/Workshops-and-Seminars/ai4h/201911/Pages/programme.aspx>.

The following follow-up actions were mentioned during the workshop:

* Need for creation of working groups on ethics and on clinical evaluation
* TB audio topic group?
* Child growth monitor topic group?
* Pregnant woman screening topic group?
* Collaboration methods with mobile platforms on data/AI topics
* Formats for data transmission for remote AI
* Requirements for an app for collective data annotation

NOTE – [G-002-R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-002-R01.pptx) includes the above list of follow up actions.

# Review of incoming liaison statements

No income LSs were received in time for review at the meeting. A late LS received will be reviewed at the next FG meeting.

# FG-AI4H deliverables

[G-031-R2](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-031-R02.docx) FG-AI4H deliverables [FG-AI4H chairman]

This draft was developed by the FG-AI4H management and proposes a list of deliverables of ITU/WHO Focus Group on Artificial Intelligence for Health (AI4H), define their broad goals, leadership, deadlines, target users, and lists existing materials that can be considered in their development.

The FG chairman introduced the document and the current list.

After discussion, it was agreed to proceed with the list in Table 1 below, and a list of initial draft editors was defined. These editors were assigned with a first task of producing an initial table of contents for each of the identified deliverables within two weeks of the end of the meeting.

In regards of deliverable 2, consultation with regulators should be undertaken to better understand their objectives / needs concerning a guidelines / considerations document. Provisionally, the title indicates two possible directions: *AI4H regulatory [best practices | considerations]*.

Concerning the development process of the various deliverables, it was clarified that the process of engagement would be that experts interested to contribute to the development of deliverables should express their interest directly the identified initial draft editors, copying the secretariat ([tsbfgai4h@itu.int](mailto:tsbfgai4h@itu.int)).

A revised version of the plan of deliverables will be produced as an output document, as follows:

* V1 issued immediately will contain just the table 1 below (without names and document numbers)
* V2 to be issued early December 2019 will contain all the elements currently in G-031-R2.

NOTE – These deliverable documents need a template document, with a pre-defined table of contents, to be prepared in time for the next FG meeting.

1. The identified list of deliverables identified at this meeting will be issued as an output document of this meeting, [FGAI4H-G-200-R02](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-200-R02.docx).
2. The initial draft editors assigned to each of the deliverables are tasked to prepare a skeleton the latest by 2 December 2019 and provide to the secretariat for circulation.
3. Experts interested in contributing to a particular deliverable identified at this meeting are asked to contact the initial draft editor expressing their interest in joining (see Table 1 in FG-AI4H-G-101), copying the secretariat at [tsbfgai4h@itu.int](mailto:tsbfgai4h@itu.int).

Table 1 – Updated list of deliverables and initial editors

| No. | Deliverable | Initial draft editor | Reserved Number |
| --- | --- | --- | --- |
| 1 | AI4H ethics considerations | [Andreas Reis](mailto:reisa@who.int) (WHO),  [Julia Mohapatra](mailto:juliam24@gmail.com) (NICF, India) | [G-201](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-201.docx) |
| 2 | AI4H regulatory [best practices | considerations] | [Jackie Ma](mailto:jackie.ma@hhi.fraunhofer.de) (Franhofer HHI, Germany) | [G-202](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-202.docx) |
| 3 | AI4H requirements specification | [Pradeep Balachandran](mailto:pbn.tvm@gmail.com), [Tina Purnat](mailto:purnatt@who.int) (WHO) | [G-203](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-203.docx) |
| 4 | AI software life cycle specification | [Pat Baird](mailto:pat.baird@philips.com) (Philips, USA),  [Tina Purnat](mailto:purnatt@who.int) (WHO) | [G-204](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-204.docx) |
| 5 | Data specification | [Marc Lecoultre](mailto:ml@bigps.ch) (Business Investigation, Switzerland) | [G-205](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-205.docx) |
| 5.1 | Data requirements | [Gupta Saurabh](mailto:drsaurabhmd@gmail.com) (AIIMS, India),  [Manjula Singh](mailto:singhmanjula.hq@icmr.gov.in) (ICMR, India) | [G-205-A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-205-A01.docx) |
| 5.2 | Data acquisition | [Rajaraman (Giri) Subramanian](mailto:kinnal@hotmail.com) (Calligo Tech, India),  [Vishnu Ram](mailto:vishnu.n@ieee.org) (India) | [G-205-A02](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-205-A02.docx) |
| 5.3 | Data annotation specification | [Shan Xu](mailto:xushan@caict.ac.cn) (CAICT, China),  [Harpreet Singh](mailto:hsingh@bmi.icmr.org.in) (ICMR, India) | [G-205-A03](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-205-A03.docx) |
| 5.4 | Training and test data specification | [Luis Oala](mailto:luis.oala@hhi.fraunhofer.de) (Franhofer HHI, Germany),  [Pradeep Balachandran](mailto:abn.tvm@gmail.com) (India) | [G-205-A04](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-205-A04.docx) |
| 5.5 | Data handling | [Marc Lecoultre](mailto:ml@bigps.ch) (Business Investigation, Switzerland) | [G-205-A05](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-205-A05.docx) |
| 5.6 | Data sharing practices | [Ferath Kherif](mailto:Ferath.Kherif@chuv.ch) (CHUV, Switzerland),  [Banusri Velpandian](mailto:banusrir@gmail.com) (ICMR, India),  WHO Data Team | [G-205-A06](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-205-A06.docx) |
| 6 | AI training best practices specification | [Ma Su Su](mailto:susu@aisingapore.org) and [Stefan Winkler](mailto:stefan@aisingapore.org) (AI Singapore) | [G-206](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-206.docx) |
| 7 | AI4H evaluation specification | [Markus Wenzel](mailto:markus.wenzel@hhi.fraunhofer.de) (Fraunhofer HHI, Germany) | [G-207](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-207.docx) |
| 7.1 | AI4H evaluation process description | [Sheng Wu](mailto:wus@who.int) (WHO) | [G-207-A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-207-A01.docx) |
| 7.2 | AI technical test specification | [Auss Abbood](mailto:abbooda@rki.de) (Robert Koch Institute, Germany) | [G-207-A02](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-207-A02.docx) |
| 7.3 | AI technical test metric specification | [Luis Oala](mailto:luis.oala@hhi.fraunhofer.de) (Fraunhofer HHI, Germany) | [G-207-A03](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-207-A03.docx) |
| 7.4 | Clinical validation | [Naomi Lee](mailto:naomi.lee@lancet.com) (Lancet, UK),  [Manjula Singh](mailto:singhmanjula.hq@icmr.gov.in) (ICMR, India),  [Rupa Sarkar](mailto:rupa.sarkar@lancet.com) (Lancet, UK) | [G-207-A04](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-207-A04.docx) |
| 8 | AI4H scale-up and adoption | [Sameer Pujari](mailto:pujaris@who.int) (WHO) | [G-208](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-208.docx) |
| 9 | AI4H applications and platforms | [Manjeet Chalga](mailto:chalgams.hq@icmr.gov.in) (ICMR, India),  [Aveek De](mailto:aveek@cms-india.org) (CMS, India) | [G-209](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-209.docx) |
| 9.1 | Mobile applications | [Khondaker Mamun](mailto:mamun@cse.uiu.ac.bd) (UIU, Bangladesh),  [Manjeet Chalga](mailto:chalgams.hq@icmr.gov.in) (ICMR, India) | [G-209-A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-209-A01.docx) |
| 9.2 | Cloud-based AI applications | [Khondaker Mamun](mailto:mamun@cse.uiu.ac.bd) (UIU, Bangladesh) | [G-209-A02](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-209-A02.docx) |
| 10 | AI4H use cases: Topic description docs. | [Eva Weicken](mailto:eva.weicken@hhi.fraunhofer.de) (Fraunhofer HHI, Germany) | [G-210](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-210.docx) |
| 10.1 | Cardiovascular disease risk prediction (TG-Cardio) | [Benjamin Muthambi](mailto:brm5@caa.columbia.edu) (Watif Health, South Africa) |  |
| 10.2 | Dermatology (TG-Derma) | [Maria Vasconcelos](mailto:maria.vasconcelos@fraunhofer.pt) (Fraunhofer Portugal) |  |
| 10.3 | Diagnosis of bacterial infection and anti-microbial resistance (TG-Bacteria) | [Nada Malou](mailto:nada.malou@paris.msf.org) (MSF, France) |  |
| 10.4 | Falls among the elderly (TG-Falls) | [Inês Sousa](mailto:ines.sousa@fraunhofer.pt) (Fraunhofer Portugal) |  |
| 10.5 | Histopathology (TG-Histo) | [Frederick Klauschen](mailto:frederick.klauschen@charite.de) (Charité Berlin, Germany) |  |
| 10.6 | Malaria detection (TG-Malaria) | [Rose Nakasi](mailto:g.nakasi.rose@gmail.com) (Makerere University, Uganda) |  |
| 10.7 | Maternal and child health (TG-MCH) | [Raghu Dharmaraju](mailto:rdharmaraju@gmail.com) (Wadhwani AI, India), [Hafsa Mwita](mailto:hafsa.m.mwita@gmail.com) (University of Zanzibar, Tanzania) | [G-043](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-043.docx) |
| 10.8 | Neurological disorders (TG-Neuro) | [Marc Lecoultre](mailto:ml@bigps.ch) (Business Investigation, Switzerland) |  |
| 10.9 | Ophthalmology (TG-Ophthalmo) | [Arun Shroff](mailto:arunshroff@gmail.com) (MedIndia) |  |
| 10.10 | Outbreak detection (TG-Outbreaks) | [Stéphane Ghozzi](mailto:ghozzis@rki.de) (Robert Koch Institute, Germany) |  |
| 10.11 | Psychiatry (TG-Psy) | [Nicolas Langer](mailto:n.langer@psychologie.uzh.ch) (ETH Zurich, Switzerland) |  |
| 10.12 | Radiotherapy (TG-Radiotherapy) | [Joe Wu](mailto:joe.wu@biomind.ai) (Biomind, China) |  |
| 10.13 | Snakebite and snake identification  (TG-Snake) | [Rafael Ruiz de Castaneda](mailto:Rafael.RuizDeCastaneda@unige.ch) (UniGE, Switzerland) |  |
| 10.14 | Symptom assessment (TG-Symptom) | [Henry Hoffmann](mailto:henry.hoffmann@ada.com) (Ada Health, Germany) |  |
| 10.15 | Tuberculosis (TG-TB) | [Manjula Singh](mailto:singhmanjula.hq@icmr.gov.in) (ICMR, India) |  |
| 10.16 | Volumetric chest CT (TG-DiagnosticCT) | [Kuan Chen](mailto:ckuan@infervision.com) (Infervision, China) |  |
| 10.17 | Dental diagnostics and digital dentistry (TG-Dental) | [Falk Schwendicke](mailto:falk.schwendicke@charite.de) and [Joachim Krois](mailto:Joachim.krois@charite.de) (Charité Berlin, Germany) | [G-042](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-042.docx) |
| 10.18 | Falsified Medicine (TG-FakeMed) | [Frank Verzefé](mailto:fverzefe@gmail.com) (TrueSpec-Africa, DRC) |  |

# Horizontal and strategic topics

[G-029](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-029.docx): Convergence of AI with blockchain technology in healthcare domain [MoC, India]

**Summary:** This contribution proposes to explore the usage of Block chain and its associated technologies such as distributed ledger technology (DLT), smart contracts, etc in the AI applications for Health to enable the Trust, Transparency, Accountability & Security aspects. Hence, it is proposed that this Focus group may undertake a study and release a report on the convergence of AI with Blockchain technology in Healthcare sector, as a deliverable.

The document was presented by [Sathish Kumar](mailto:mc.sathish@gov.in) (Ministry of Communications, India)

The meeting thanked the contribution and agree that blockchain has a large potential for application in health applications, however a "killer case" application is not yet clear. Annotation can be a sample case of interest, to avoid data tampering of training data.

Technology that can be applied in some cases, and that can be explored. Proposal was to explore the use of blockchain for health. WG-DASH to develop of a collection of best practices. Sathish Kumar ([mc.sathish@gov.in](mailto:mc.sathish@gov.in), Ministry of Communications, India) and Badar Awlad Thani ([bader.awladthani@moh.gov.om](mailto:Bader.awladthani@moh.gov.om), Oman) agreed to join the work in WG-DASH to drive developing this topic.

1. Agreed to collect use cases on the use of blockchain on AI for health applications and systems within WG-DASH. Sathish Kumar ([mc.sathish@gov.in](mailto:mc.sathish@gov.in), Ministry of Communications, India) and Badar Awlad Thani ([bader.awladthani@moh.gov.om](mailto:Bader.awladthani@moh.gov.om), Oman) agreed to drive developing this document.

# Working Group updates

## Data and AI solution assessment methods (WG-DAISAM)

The group is chaired by Pat Baird (Philips, USA), assisted by vice-chair [Luis Oala](mailto:luis.oala@hhi.fraunhofer.de) (Fraunhofer HHI, Germany). The progress report of WG-DAISAM and the following two documents were presented by its vice-chair, Luis Oala (Fraunhofer HHI, Germany).

[G-037](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-037.docx) Regulatory review: six quality criteria for data and AI solution assessment [WG DAISAM chairs]

**Summary:** In this document we outline the preliminary results in the working package "Regulatory Review" of WG-DAISAM. This includes a tentative list of six quality criteria for data and AI solution assessment: (1) description, (2) risk, (3) security/privacy, (4) interfaces/dependencies, (5) verification/validation/testing, and (6) change management. These quality criteria were sourced from a selection a of regulatory and guidance documents. Each quality criterion is accompanied by a selection of questions that were collected from the regulatory and guidance documents as well.

[G-038](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-038.pptx) + [A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-038-A01.xlsx) Mapping of IMDRF essential principles to AI for health software [WG-DAISAM, FG-AI4H Chair]

**Summary:** This document contains a mapping of the IMDRF Essential Principles to related aspects of AI for health software.

The documents were presented, no comments.

Vishnu Ram mentioned that there is a framework for data handling and processing developed by the FG-ML5G that can be adapted and volunteered to help.

## Data and AI solution handling (WG-DASH) [Marc Lecoultre; Ferhat Kerif]

### Progress report

WG-DASH chair, [Marc Lecoultre](mailto:ml@bigps.ch) (Business Investigation, CH), presented an overview of activities of WG-DASH. Vice-chair [Ferath Kherif](mailto:Ferath.kherif@chuv.ch) (CHUV, CH) joined remotely.

Should expand the scope of the DASH scope to understand federation of data sources.

Data collection track is unclear moving forward, WHO considers it possible, more challenging on the distribution side. WHO estimates that a treaty would be required, but it would require some time to be put into place. It is not only health data – e.g. weather data, or data from other sources – that could be used for input for modelling some specific health problems.

Various participants (Oman, Singapore, India, Sri Lanka) informed the meeting on experience in their countries for sharing data sharing.

Data format should be recognized in regulations to enable sharing.

Have a group to document incentive system and inclusion. The FG chairman suggested that Ferath Kherif coordinate the collection of current data sharing practices, aiming to be used as background information. It would be desirable that the WHO data team be involved.

There are data structures developed by the ITU FG on ML5G, should investigate whether those could be used / adapted for the FG-AI4H.

1. It was agreed to create an FG deliverable containing practices of health data sharing within countries under the WG DASH. Ferhat Kherif (CHUV, CH) was asked to coordinate this effort.

### Requirements for app for collective data acquisition and data annotation

After discussions on data acquisition exercise in the TG Falls presentation, it was agreed that the FG-AI4H should work on requirements for app for collective data acquisition and data annotation. User registration mechanism and user data mechanism aspects should be addressed. The app should reflect these specs, e.g. include data statistics tools/reports, etc. This activity will be driven by Manjeet Chalga (ICMR, India) and Pierpaolo Palumbo (University of Bologna, Italy).

Experts willing to contribute should contact them directly, CC to the secretariat ([tsbfgai4h@itu.int](mailto:tsbfgai4h@itu.int)).

The delivery date for this requirements document is 6 January 2020.

1. Agreed to create an editing group to derive a requirements document for app for collective data acquisition and data annotation led by Manjeet Chalga ([manjeetchalga@gmail.com](mailto:manjeetchalga@gmail.com), ICMR, India) and Pierpaolo Palumbo ([pierpaolo.palumbo@unibo.it](mailto:pierpaolo.palumbo@unibo.it), University of Bologna, Italy). Delivery deadline: 6 January 2020. Experts interested in joining the activity should contact them directly, with the secretariat in CC ([tsbfgai4h@itu.int](mailto:tsbfgai4h@itu.int))

## Operations (WG-O)

The chair of the WG-O, Markus Wenzel (Fraunhofer HHI, Germany), introduced [G-036](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-036.pptx) with a status update of operations activities of the FG, most notably the development of an onboarding document in [G-035](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-035.docx). This document explains how to get involved in the ITU/WHO focus group on "AI for Health" and serves as an onboarding guide for new interested parties and individuals.

The first version of the onboarding document was approved, some postproduction will be needed for easier consumption. FG participants are encouraged to use it to brief newcomers on how to join the activities of the FG-AI4H.

1. The revised version of the onboarding document in G-035 is agreed as output document; see [G-107](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-107.docx). Some postproduction editing will be applied to the document prior to posting on the website.

## Regulatory considerations on AI for health (WG-RC)

The chair of the WG-RC, Naomi Lee (Lancet, UK), presented a status update. Representatives, looking for more regulators globally. First physical meeting expected now in Singapore in March 2020 (postponed from earlier foreseen dates), collocated with the FG-AI4H group. ICMR will suggest members for the WG. It will be very important to have the WG-RC provide their inputs / oversight into the work of the TGs.

The following two contributions were dealt under WG-RC discussions.

[G-027](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-027.docx): Regulatory and ethical consideration for AI in health [MoC, India]

**Summary:** This document describes some of the major challenges facing healthcare in India, the accompanying ethical concerns, and potential solutions.

The document was noted as the author was not present.

[G-033](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-033.docx): Evolving ethical and regulatory framework for AI4H [MoC, India]

**Summary:** This contribution contains the draft text for the technical study for Evolving Ethical and Regulatory Framework for AI4H.

Introduced by Mandeep Singh. Trust in AI for health is a big issue. The meeting thanked the author and noted the document.

## Health requirements (WG-HR)

At the meeting in Zanzibar, consideration was given to closing this working group, since no activities have been held recently.

The meeting agreed to close this working group, with thanks to the efforts of co-chairs Laragh Gollogly (WHO) and Ramesh Krishnamurthy (WHO).

1. The Health requirements (WG-HR) is formally closed.

## Ethics

**Draft ToR**: [G-034](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-034.docx) [Inspired Ideas, Tanzania; University of Oslo,Norway]

**Summary:** At the FG-AI4H meeting in Zanzibar, the idea to create a working group on ethics was introduced. This document contains the proposed Terms of Reference for the FG-AI4H Working Group on Ethics (WG-Ethics). This document is provided for discussion, refinement, and approval by the FG-AI4H meeting in New Delhi.

Suggested new deliverable for WG-Ethics

* List currently known problems / problem areas

Plan is to share the ToR with the WHO WG for their consideration, after some careful revision is made.

Discussions:

[G-026](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-026.docx) Ethical issues in AI for Health [MoC, India]

**Summary:** Artificial Intelligence (AI) has revealed an enormous potential in the field of Health. But for all of AI’s potential in healthcare, it is an awesome responsibility to manage machines that can learn and make decisions without human direction. While Standardization Development Organizations like ITU, ISO/IEC, and IEEE SA have begun work on certain AI related areas however, it is imperative to lay down ethical foundation for using AI technology safely / effectively, creating open process for codifying rights / regulations around issues such as privacy, security, trustworthiness, robustness, transparency and above all, ethics. The rise of AI carries moral, legal and security questions. Development of a thoughtfully designed, high-quality and clinically validated AI technology for medical system is essential. Ultimately there will always be a human element in the practice of medicine. AI technology will most likely be a complementary tool and not a replacement for a physician. The essence should lie in becoming not overpowered but empowered by the technology.

Presented by Deepa Tyagi (DoT, India). This is a high-level contribution highlighting some of the important aspects. It is important to consider the technical issues in addition to medical-centric point of view. E.g. not all machines/systems are able to read DICOM images, as the internal format can be different. Interoperability of data is needed, need to avoid silos of technology and of data. Backward compatibility with old equipment. Vishnu Ram noted that not all systems need standards, but data interoperability is needed; open data is a good approach.

Agreed we should create a group on ethics, aligned / mirroring a WG in WHO on the topic. The FG should identify a method to make such a joint cooperation effective, also keeping in mind the FG lifetime. The ToR and leadership of the WG-Ethics will be defined after this harmonization with the WHO group, and in the meantime the WG-Ethics will be listed in the webpage as "in preparation".

After discussions, it was felt useful to collect all ethics related document to share with the WHO WG on ethics, which was agreed.

1. Agreed to create a WG on Ethics, with ToR and leadership to be defined after harmonization with the WHO group on Ethics. It will be listed on the main FG-AI4H webpage as "in preparation".
2. Agreed to collect all ethics related documents submitted to FG-AI4H to share with the WHO WG on ethics.

## Clinical evaluation

While a ToR still needs to be developed, it is agreed that this is an import area to be addressed by the FG. It is expected that the outcomes of this group would not be an-depth set of (operational) recommendations, but rather a collection of general guidelines. The WG will be listed in the webpage as "in preparation", while its ToR and leadership are pending.

1. Agreed to list the new WG on Clinical Evaluation as "in preparation" in the FG-AI4H website, until its ToR and leadership are defined.

# Updates and new proposals for existing TGs

The following TGs received no updates at this meeting:

* TG-Bacteria (Diagnoses of bacterial infection and anti-microbial resistance)  
  Last updates: No initial documentation. Proposed at meeting F.
* TG-DiagnosticCT (Volumetric chest computed tomography)   
  Last updates: Meeting F. Proposed at meeting D.
* TG-Growth (Child growth monitoring)   
  Last updates: No initial documentation. Proposed at meeting D and re-started at meeting F.
* TG-Histo (Histopathology)   
  Last updates: Meeting E. Proposed at meeting B.
* TG-Radiotherapy (Radiotherapy)   
  Last updates: No initial documentation. Proposed at meeting D.

1. It was agreed to remind TG Drivers that an update of their activities is expected at each FG meeting.

Drivers for the new topic groups are requested to submit at the next meeting a topic description document and call for topic group participation using the current templates:

* [C-105](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-105.docx) (TDD)
* [F-004](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-F-004.docx) (CfTGP)

## TG-Cardio (Cardiovascular risk prediction)

CfTGP: [G-005-A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A01.docx)

TDD Update: [G-006](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-006.docx) + [A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-006-A01.pdf)

The chair of the TG-Cardio, [Benjamin Muthambi](mailto:brm5@caa.columbia.edu), provided an update to the TG work ([G-006-A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-006-A01.pdf)). A list of tentative milestones was provided (last slide). An updated TDD was provided in DOC, but the TG driver noted that combination of both sub-topics into a single TDD will take significant effort, as the topics are very different. The CfTGP was last updated at meeting E and is reproduced for this meeting as [G-005-A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-F-005-A01.docx) for easier reference.

Contributions:

[G-021](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-021.docx) TG-Cardio: Input for sub-topic - General framework of development and evaluation of artificial intelligence in coronary computed tomography angiography [Sub-topic Coronary CT, ShinKun Technology, MIIT (China)]

**Summary:** This document contains elements to be incorporated in the TDD document for the TG-Cardio activity, relevant to the sub-topic on artificial intelligence in coronary computed tomography angiography.

The author of G-021 (Nathan Guo, ShinKun Technology, China) was not present, and he is asked to coordinate with the TG-Cardio driver on how to draft an integrated version of the TDD as last found in G-006.

## TG-Cogni (Neurocognitive diseases)

CfTGP: [G-005-A02](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A02.docx)

TDD Update: [G-007](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-007.docx)

Contributions: N/A

The TG Driver, [Marc Lecoultre](mailto:ml@bigps.ch) (Business Investigation, CH), presented its progress report. Data is currently available from about 6000 patients. Need to build the data repository and aggregate the date. It would need to harmonize the data and integrate into a common dataset, to make it usable.

There were advocacy activities towards the European Commission on data availability matters.

Various requests to join the group, in particular Ontario (presented at meeting F), Georgia, data sources in Africa (about 70 volunteers). Need to effectively onboard them. Fraunhofer HHI (Eva Weicken) also expressed interest in joining the TG.

As a result of the discussions on [G-040](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-040.docx) on the use of AI for detection Parkinson's disease (see §13.6), TG-Cogni (Neuro-cognitive diseases) is renamed as TG-Neuro "Neurological diseases" and it will have two sub-topics, the current one on neuro-cognitive diseases and another on AI based Parkinson's disease screening and management. Marc Lecoultre remains the TG Driver and will work electronically with the new sub-topic driver, [Khondaker Mamun](mailto:mamun@cse.uiu.ac.bd) (AIMS Lab, United International University, Bangladesh), for developing the necessary CfTGP and TDD texts.

## TG-Bacteria (Diagnoses of bacterial infection and anti-microbial resistance)

CfTGP: G-005-A09 (reserved but not provided)

TDD Update: G-015 (Reserved but not provided)

Contributions: N/A

The TG Driver, [Nada Malou](mailto:nada.malou@paris.msf.org) (MSF, France), did not join this meeting and initial CfTGP and TDD documents were provided.

## TG-Derma (Dermatology)

CfTGP: [G-005-A03](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A03.docx)

TDD Update: [G-008](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-008.docx)

Contributions: N/A

The TG-Derma Driver, [Maria Vasconcelos](mailto:maria.vasconcelos@fraunhofer.pt) (Fraunhofer Portugal), presented its progress report. No written updates provided. Still working for increasing the network of experts. Lesion assessment in images by one clinician taking the samples plus three dermatologists (after the fact, without contact with the patient). Also making control between the 1 versus 3 clinicians. Screening, difficult to have a different classification, as they differ by jurisdiction.

The CfTGP and TDD were last updated at meeting E and are reproduced for this meeting as [G-005-A03](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-F-005-A03.docx) and [G-008](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-008.docx), respectively, for easier reference.

## TG-DiagnosticCT (Volumetric chest computed tomography)

CfTGP: [G-005-A04](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A04.docx)

TDD Update: [G-009](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-009.docx)

Contributions: N/A

The TG Driver, [Kuan Chen](mailto:ckuan@infervision.com) (Infervision, China), did not join the meeting and no updates provided.

The CfTGP and TDD were last updated at meeting F and are reproduced for this meeting as [G-005-A04](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A04.docx) and [G-009](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-009.docx), respectively, for easier reference.

## TG-Falls (Falls among the elderly)

CfTGP: [G-005-A05](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A05.docx)

TDD Update: [G-010](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-010.docx)

Contributions: N/A

The TG-Driver, [Inês Sousa](mailto:ines.sousa@fraunhofer.pt) (Fraunhofer Portugal) provided an update of the activities in the TG-Falls. Follow patients for one year to develop ground truth. Extending the network of collaborators, various groups developing questionnaires and data collection related to the risk of falls.

The CfTGP and TDD were last updated at meeting E and are reproduced for this meeting as [G-005-A03](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-F-005-A03.docx) and [G-008](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-008.docx), respectively, for easier reference.

## TG-Histo (Histopathology)

CfTGP: [G-005-A06](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A06.docx)

TDD Update: [G-011](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-011.docx)

Contributions: N/A

The TG Driver, [Frederick Klauschen](mailto:frederick.klauschen@charite.de) (Charité Berlin, Germany), did not join the meeting and no updates provided.

The CfTGP and TDD were last updated at meeting E and are reproduced for this meeting as [G-005-A03](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-F-005-A03.docx) and [G-008](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-008.docx), respectively, for easier reference.

## TG-Ophthalmo (Ophthalmology)

CfTGP: [G-005-A07](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A07.docx)

TDD Update: [G-012](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-012.docx)

Contributions: [G-030-R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-030-R01.docx), [G-028](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-028.docx)

The TG-Ophthalmo Driver, [Arun Shroff](mailto:arunshroff@gmail.com) (MedIndia), updated the meeting on the activities of the TG-Ophthalmo.

Two associated documents were presented remotely, as follows.

[G-030-R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-030-R01.docx) TG-Ophthalmo: Proposal for sub-topic - AI based aetiological classification of red eye [St. John's Medical College (India)],

**Summary:** Eye problems are the reason for 2-3% visits to primary health centres and emergency facilities, the majority of which are cases of red eye. Recognising the need for emergent referrals to an ophthalmologist for some causes is the key in the primary care management of red eye. We propose to assess the use of smartphone images for the differential diagnosis of red eye and creation of gold standard annotations for use in an artificial intelligence algorithm. We would like to include this proposal as a sub-topic under TG-Ophthalmology.

[G-028](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-028.docx) TG-Ophthalmo: Input for sub-topic - Leveraging Edge analytics and Artificial Intelligence for the rapid assessment of avoidable blindness [Calligo Tech (India)]

**Summary:** This document contains elements to be incorporated in the TDD document for the TG-Ophthalmo activity, relevant to the sub-topic on AI in diabetic retinopathy (DR).

The topics addressed in both contributions were considered highly relevant and match the purpose of the TG-Ophthalmo. Both contributors agreed to join the work of TG-Ophthalmo.

Other interested parties are invited to join the discussions at the newly created mailing list for the TG-Ophthalmo ([fgai4htgophthalmo@lists.itu.int](mailto:fgai4htgophthalmo@lists.itu.int)).

## TG-Outbreaks (AI for outbreak detection)

CfTGP: [G-005-A13](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A12.docx)

TDD Update: [G-013](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-013.docx) + [A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-013-A01.pptx); F-013-A01 [A02](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-013-A02.pptx)

Contributions: [G-032](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-032.docx)

The meeting thanked former co-drivers Martina Fischer and Janina Esins (Robert Koch Institute) were thanked for their efforts to start TG-Outbreaks and welcomed the two new co-drivers, [Stephane Ghozzi](mailto:GhozziS@rki.de) and [Auss Abbood](mailto:AbboodA@rki.de) (Robert Koch Institute).

TG co-driver Auss Abbood reported the progress on the TG-Outbreaks in G-013-A01. He also presented for information of the meeting the scope of the TG, available from the meeting F in Zanzibar as F-013-A01 (reissued as [A02](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-013-A02.pptx)). The CfTGP was last updated at meeting F, reissued as [G-005-A13](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A12.docx) for easier reference at this meeting.

He highlighted the importance of federating / integrating different data sources to enable effective outbreak detection. That may include data collected from other activities, e.g. Dengue and influenza outbreaks.

As recorded in §13.4, the contributors of the Dengue detection proposal in Singapore (G-024) will join the TG-Outbreaks to progress their proposed benchmarks.

Need to get test data, especially from a larger number of countries (in particular outside Europe). Need to be representative of a large number of countries and regions. Interested parties can contact the topic drivers to discuss how to best engage with the group’s work.

Outbreaks need to be kept specific, as this is a broad area, e.g. focusing on pathogens (Saurabh Johri, [saurabh.johri@babylonhealth.com](mailto:saurabh.johri@babylonhealth.com)). Tools need to be robust and categorizing types of outbreaks may help (Julia Mohapatra, [juliam24@gmail.com](mailto:juliam24@gmail.com)).

[G-032](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-032.docx) TG-Outbreaks: Infectious disease outbreak predicting using deep learning [Azadur Rahman Sarker]

**Summary:** Infectious disease trends are variable and means prediction is not easy. This article predicts infectious diseases outbreak by optimizing the parameters of deep learning algorithms, considering big data including social media data. The performance of the deep neural network (DNN) and long-short term memory (LSTM) learning models were compared with the autoregressive integrated moving average (ARIMA) when predicting three infectious diseases one week into the future. The results show that the DNN and LSTM models perform better than ARIMA. When predicting chickenpox, the top-10 DNN and LSTM models improved average performance by 24% and 19%, respectively. The DNN model performed stably and the LSTM model was more accurate when infectious disease was spreading.  
We believe that these findings can help eliminate reporting delays in existing surveillance systems and minimize costs to society.

Azadur Rahman Sarker presented the document remotely. Facebook is very popular in Bangladesh, so it may be suitable to be used as an open data source; this needs to carefully investigated. One concern is that data source cannot be verified (data verification).

## TG-Malaria (Malaria detection)

CfTGP: [G-005-A14](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A14.docxhttps:/extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A12.docx)

TDD Update: [G-019](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-019.docx)

Contributions: N/A

The initial TDD and CfTGP were presented remotely by the TG Driver, [Rose Nakasi](mailto:g.nakasirose@gmail.com) (Makerere University, Uganda). Data policies (how to share data) is an issue across borders.

Mohd Zakariah (Malaysia) suggested that his dataset on Dengue outbreak (see §13.4) could be used to improve the Malaria detection models being developed.

## TG-Psy (Psychiatry)

CfTGP: [G-005-A08](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A08.docx)

TDD Update: [G-014](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-014.docx) + [A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-014-A01.pdf)

Contributions: N/A

The TG-Psy topic driver, [Nicholas Langer](mailto:n.langer@psychologie.uzh.ch) (ETH Zurich, Switzerland), provided remotely an update of the progress of the group.

The CfTGP was last updated at meeting E, reissued as [G-005-A08](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A08.docx) for easier reference at this meeting.

## TG-Radiotherapy (Radiotherapy)

CfTGP: N/A

TDD Update: N/A

Contributions: N/A

The TG Driver, [Zhenzhou (Joe) Wu](mailto:joe.wu@biomind.ai) (Biomind, China), did not join the meeting. No TDD or CfTGP documentation is yet available for this TG.

## TG-Snake (Snakebite and snake identification)

CfTGP: [G-005-A10](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A10.docx)

TDD Update: [G-016](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-016.docx) + [A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-016-A01.pptx)

Contributions: N/A

An update was provided remotely by the TG Driver, [Rafael Ruiz](mailto:rafael.ruizdecastaneda@unige.ch) (University of Geneva) using [G‑016‑A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-016-A01.pptx), assisted by Andrew Durso and Isabelle Bolon.

In close collaboration with *AIcrowd* platform, a benchmarking process of the best crowdsourced snake identification AI algorithm was performed. The AI solution was proposed by an Indian computer scientist using training data made available via *AIcrowd* (F1=0.861, Log Loss=0.532) and then tested internally by *AIcrowd* with representative secret data (F1=0.826, Log Loss=0.657). The TG Driver is writing a manuscript detailing this whole process for presentation at the next meeting. Meanwhile, a new challenge was launched on *AIcrowd* integrating geo-information on the snake images, that we expect will help further improve the current solution. Various use cases of snakebite recognition were presented.

## TG-Symptom (Symptom assessment)

CfTGP: [G-005-A11](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A11.docx)

TDD Update: [G-017](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-017.docx)

Contributions: N/A

The progress report for TG-Symptoms was presented by its Driver, [Henry Hoffmann](mailto:henry.hoffmann@ada.com) (ADA Health, Germany), assisted by Yura Perov (Babylon Health). Good progress achieved and engagement of various news partners. Several e-meetings. Have an online platform applying a set of questions (synthetic), which are handled remotely (via an API) at back end servers of various private (not shared) models for handling the questions.

## TG-TB (Tuberculosis)

CfTGP: [G-005-A12](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A12.docx)

TDD Update: [G-018](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-018.docx)

Contributions: N/A

The TG TB driver, [Manjula Singh](mailto:drmanjulasb@gmail.com) (ICMR, India), presented an update to the TG work. A large set of DICOM images have been acquired, of which a small set has been provided to application developers for an exploration on their performance.

The CfTGP was last updated at meeting E, reissued as [G-005-A12](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A12.docx) for easier reference at this meeting.

## TG-Growth (Child growth monitoring)

CfTGP: N/A

TDD Update: N/A

Contributions:

The TG-Growth Driver, [Hafsa M. Mitwa](mailto:hafsa.m.mwita@gmail.com) (Zanzibar University, Tanzania), did not join the meeting and no initial documentation was provided.

During the workshop, however, a project led by Raghu Dharmaraju (Wadhwani AI, India; see presentation at <https://www.itu.int/en/ITU-T/Workshops-and-Seminars/ai4h/201911/Documents/‌S5_Raghu_Dharmaraju_Presentation.pdf>) showed a promising application on using 3D imaging to estimate child weight and size, which could be used to jump-start this important TG.

At the FG meeting, the issue was re-examined and it was agreed to rename the TG-Growth (Child growth monitoring) as TG-MCH (Maternal and child health), with [Raghu Dharmaraju](https://ituint-my.sharepoint.com/personal/ayda_dabiri_itu_int/Documents/FG-AI4H%20G%20New%20Delhi/+91%2097405%2094411) ([rdharmaraju@gmail.com](mailto:rdharmaraju@gmail.com), Wadhwani AI) as the new TG Driver. Ms [Hafsa M. Mitwa](mailto:hafsa.m.mwita@gmail.com) (Zanzibar University, Tanzania) is invited to contribute to the activity, as appropriate.

NOTE – [FGAI4H-G-043](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-043.docx) with an initial TDD for the new TG was uploaded to the server after the meeting in response to Decision Dec-G-2 (§9).

1. TG-Growth (Child growth monitoring) is renamed TG-MCH (Maternal and child health), with Raghu Dharmaraju ([rdharmaraju@gmail.com](mailto:rdharmaraju@gmail.com), Wadhwani AI) as the TG Driver.

# Proposals for new topic areas

## Dental diagnostics

[G-020](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-020.docx) New Topic Group: Dental Diagnostics [Charité Berlin]

**Summary:** As response to the "Call for Proposals: Use Cases, Benchmarking, and Data (F-102)", we propose a topic group (TG) that focusses on diagnostics in dentistry, dental and oral medicine, and associated disciplines. AI will help to improve diagnostic accuracy and pave the way to a more personalized, precise, preventive and participatory dentistry for more people worldwide. It has the potential to aid in overcoming current ineffective, expensive care models. Benchmarking is expected to yield more robust models and algorithms and to allow transparent comparisons of different models and algorithms.

Emerging new trend. What is the motivation, since the X-rays is taken at dentist's offices? From X-rays taken in central locations, can assist dentists in early detection of dental issues. Datasets are available, generated inhouse. Data is available for research purposes across the globe.

NOTE – [FGAI4H-G-042](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-042.docx) with an initial TDD for the new TG was uploaded to the server after the meeting in response to Decision Dec-G-2 (§9).

1. Agreed to create a new topic group on dental diagnostics and digital dentistry (TG-Dental), topic drivers are Falk Schwendicke ([falk.schwendicke@charite.de](mailto:falk.schwendicke@charite.de)) and Joachim Krois ([Joachim.krois@charite.de](mailto:Joachim.krois@charite.de)), Charité Berlin (Germany).

## AI-based detection of falsified medicine\*

[G-022](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-022.docx) New Topic Group: AI-based detection of falsified medicine [TrueSpec-Africa]

**Summary:** The presence of substandard and falsified medical products in countries and their use by patients threatens to undermine progress towards meeting the Sustainable Development Goals. Such products may be of poor quality, unsafe or ineffective, threatening the health of those that take them. The problem of substandard and falsified medical products continues to increase, as globalized manufacturing and distribution systems grow ever more complex. That complexity heightens the risk that production errors will occur, or that medicines will degrade between factory and consumer. Increasing demand for medicines, vaccines and other medical products in almost every country, in addition to poor supply-chain management and the growth of e-commerce also creates opportunities for falsified medicines to be introduced into the supply chain.  
Unfortunately, reliable information on the true public health and socioeconomic impacts of substandard and falsified medical products is sparse. A stronger evidence base is needed to help prevent, detect and respond to substandard and falsified medical products, and the public health threat they represent. The falsified and sub-standard drugs today cause, according to the University of Edinburgh (childhood pneumonia model) the death of 250,000 children a year. Technological innovation, more precisely AI technology is one of the most effective means of dealing with increasingly creative counterfeiters. This topic group on AI-based detection of falsified medicine aims to develop artificial intelligence algorithms and to collect data available on falsified drugs.

Franck Verzefé presented remotely the proposal in G-022.

It was noted that this tool would also be relevant in the context of fighting antimicrobial resistance (AMR).

The meeting considered this to be a relevant and important topic to be pursued under the FG. It was agreed to create this new topic group with Francke Verzefé as topic driver.

1. Agreed to create a new TG-FakeMed (AI-based detection of falsified medicine) with Francke Verzefé ([fverzefe@gmail.com](mailto:fverzefe@gmail.com)), TrueSpec-Africa (DRC), as topic driver.

## Radiograph-agnostic framework and platform

[G-023](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-023.docx) New Topic Group: A Standardized radiograph-agnostic framework and platform for evaluating AI radiological systems [minoHealth AI Labs (Ghana)]

**Summary:** Radiology has been essential to accurately diagnosing diseases and assessing responses to treatment. The challenge however lies in the shortage of radiologists globally. As a response to this, a number of Artificial Intelligence solutions are being developed. The challenge Artificial Intelligence radiological solutions however face is the lack of a benchmarking and evaluation standard, and the difficulties of collecting diverse data to truly assess the ability of such systems to generalise and properly handle edge cases. A radiograph-agnostic platform and framework are proposed, which would allow any artificial intelligence radiological solution to be assessed on its ability to generalise across diverse geographical location, gender and age groups.

As the author was not available to present the document, discussion was postponed to a future opportunity.

## Dengue surveillance

[G-024](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-024.docx) New Topic Group: Utilizing AI as a Dengue dynamic surveillance and forecasting tool [AIME (Malaysia)]

**Summary:** A major challenge in outbreak surveillance is that an outbreak has often occurred before it is recognized. AIME take up this challenge by utilizing AI and ML to create a dynamic surveillance and forecasting system with capabilities to geo-locate and determine future arboviral disease outbreaks. We utilize Bayesian Network to report and forecast future dengue outbreaks in real-time. Both mathematical validation and field validation pointed out to accuracy rate > 80% across settings within 400m radius from epicentre – a commonly used designation in Vector Control operation. Training dataset consisted of 2 broad categories: Health data (obtained from National Health Authority) and non-health data which AIME subscribed from multiple public / paywall-enabled database. The system emphasized epidemiological scientific method, data integration, user-friendliness, and the use of – often ignored - environmental and socioeconomic parameters to enrich its predictive algorithm. Deployment of AIME system is anticipated to improve current dengue surveillance and vector control activities on the ground. We propose to examine the feasibility of our method and REDINT AI engine to expand the forecasting of other disease outbreak.

The suggestion that this use case be pursued within the TG-Outbreaks was accepted.

Data sharing for active participants within a topic group.

1. Agreed that the proponent of FGAI4H-G-024 would join the TG-Outbreaks contributing to the use case of outbreak detection for Dengue dynamic surveillance and forecasting.

## Universal health coverage

[G-039](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-039.docx) New TG on Universal Health Coverage [Common Health (Malaysia)]

**Summary:** This Document discusses the potential creation of a Topic Group on "AI for Universal Health Coverage."

There is agreement that this is an important area, however the proposal is unclear how this area would relate to specific AI deliverables, author was asked to provide more information.

Alternatively, the author was invited to contribute to the ITU-UNESCO Broadband Commission Working Group on AI for health that is preparing a report on how AI can improve health delivery.

## Parkinson's disease detection

[G-040](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-040.docx) – Proposal for new topic group: AI based Parkinson's disease (PD) screening and management

**Summary:** In most developing countries, where most of the basic health issues are not attended, it is obvious that Parkinson's disease (PD) is not recognized and addressed properly. But the number of PD patients is increasing rapidly and the cost regarding their treatment is affecting the gross national income of a country. We are proposing an AI based mobile application which can help the patients with PD in developing countries where healthcare professionals and service are very limited or not available to support patients with PD. Any person having a smart phone with an internet connection can use AI based screening tools and check if he/she has PD or not and get basic information about PD management as well as guidance to connect with resources which includes detail information on various services on PD and PD specialists.

Physiological data (tremor and speech) are indicators that can be used for detecting early onset of Parkinson’s disease (screening), as well as for monitoring the progress for people that has been diagnosed. Available public dataset, but there is no combined data, other solutions did not combine both signals. Should avoid oversimplification of complex. This is a neurological disorder.

Agreed as a sub-group within TG-Cogni, but renamed the TG-Cogni to TG-Neuro: Neurological disorders.

1. Agreed to rename TG-Cogni (Neuro-cognitive diseases) as TG-Neuro "Neurological diseases". Neuro-cognitive diseases use case becomes a sub-topic group within TG-Neuro. Marc Lecoultre (Business Investigation, CH) remains as the TG driver.
2. Agreed to cover the AI based Parkinson's disease screening and management use case as a sub-topic group within the TG-Neuro (ex TG-Cogni). The sub-topic is led by Khondaker Abdullah Al Mamun (AIMS Lab, United International University, Bangladesh), [mamun@cse.uiu.ac.bd](mailto:mamun@cse.uiu.ac.bd)

# Review / reconfirmation of previous output documents

Consideration should be given to update the [FG-AI4H Whitepaper](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Documents/FG-AI4H_Whitepaper.pdf), since it is about 1 year old and the FG work has evolved. Information about the FG-AI4H deliverables could be added to the document.

The following document should be updated (editorially) after this meeting:

* [F-102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-F-102.docx): Updated call for proposals: use cases, benchmarking, and data

The following documents are reconfirmed without any updates:

* [F-103](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-F-103.docx): Updated FG-AI4H data acceptance and handling policy
* [C-104](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-104.docx): Thematic classification scheme
* Templates: TDD ([C-105](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-105.docx)), CfTGP ([F-004](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-F-004.docx))

Note was made that some guidance is needed in the TDD template on when a TDD with sub-topics should be split into separate documents.

# Outcomes of this meeting

## New / extended / completed WGs

* Agreed to close the Working Group on Health requirements (WG-HR).
* Agreed that two new working groups would be created as soon as practical, WG on Clinical Evaluation (WG-CE) and WG on Ethics (WG-Ethics). They will be listed on the main FG-AI4H webpage as "in preparation".

## New TGs

* Topic group on dental diagnostics and digital dentistry (TG-Dental), topic drivers are Falk Schwendicke ([falk.schwendicke@charite.de](mailto:falk.schwendicke@charite.de)) and Joachim Krois ([joachim.krois@charite.de](mailto:Joachim.krois@charite.de)), Charité Berlin (Germany).
* TG-FakeMed (AI-based detection of falsified medicine) with Francke Verzefé ([fverzefe@gmail.com](mailto:fverzefe@gmail.com)), TrueSpec-Africa (DRC), as topic driver.

## Output documents

* [FGAI4H-G-102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-102.docx): Updated call for proposals: use cases, benchmarking, and data
* [FGAI4H-G-107](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-107.docx): Onboarding document
* [FGAI4H-G-200-R01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-200-R01.docx): List of planned FG-AI4H deliverables

# Future work

## Schedule of future FG meetings and workshops

The schedule of meetings in [G-003](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-003.docx) was reviewed and updated as found in its [Rev.1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-003-R01.docx). It is reproduced here in Table 2 for easier reference.

**Table 2– Schedule of future FG meetings (as of 2019-11-15)**

| Meeting | Date | Venue | Notes |
| --- | --- | --- | --- |
| H | 21-24 January 2020 | Brasilia, Brazil | TBC, Hosted by PAHO/WHO |
| I | Week of 16-20 March 2020 | Singapore | TBC |
| J | Week of 4-8 May 2020 | Geneva | Co-located with AI for Good |

[G-025](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-025.docx) contains an invitation and programme for the Workshop organized by WG-DASH and WG-DAISAM on AI4H standardized assessment framework & handling and assessment methods that will take place in Berlin, Germany, 8-9 January 2020.

## Work plan and timeline

Initial drafts of the deliverables identified at this FG meeting are expected to be available by 2 December 2019.

The FG management expects the lifetime of the FG to me extended by SG16 at its meeting in June-July 2020, based on feedback received at the SG16 meeting in October 2019. Deliverables completed at that date will be submitted to SG16.

## Interim activities (online)

TGs and WGs will continue their activities between this and the next FG meeting. Communications on planned e-meetings will be announced in the TG-specific and/or general mailing lists (see Annex [D](#AnnexD)) with at least one-week notice.

# Promotion and outreach

Once the FG deliverables list is more concrete, the information should be shared widely with the respective communities. Foreseen channels include talks at events, publications in academic and commercial media, social media, etc.

The FG-AI4H information will be reflected in the WHO website.

Policy is needed on how the FG logo can be used. This needs to be clarified with ITU. Be Healthy, Be Mobile has a picture that is used as its branding.

# A.O.B.

A delegate noted the issue of ITU mailing list messages being classified as spam and being blocked for several users. ITU is aware of the problem and is looking into addressing the problem.

# Closing

Closing remarks were given my Manjula Singh, Devendra Nim, Julia Mohapatra, and Thomas Wiegand. The participants expressed their appreciation to the hosts' hospitality and for their efforts in organizing an excellent symposium and meeting. The chairman thanked the participants for their engagement and enthusiasm during the meeting, the various chairs, vice-chairs and topic drivers for their continued commitment and support, as well as the secretariat.

The meeting was closed on Thursday 14 November around 1900 hours IST.

Annex A  
Agenda

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | **Related Documents** |
| 1 | Opening | | |  |
| 2 | Approval of agenda | | | [G-001](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-001.docx) (Agenda); Initial timing: Annex [C](#AnnexC) |
| 3 | Documentation and allocation | | | [G-001](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-001.docx) (Agenda; Chair);  Annex [B](#AnnexB) (Documentation) |
| 4 | IPR | | | Annex [A](#AnnexA) |
| 5 | Management updates | | |  |
| 6 | Approval of Meeting E outcomes and updates | | | [F-101](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-101.docx): Meeting report  *At meeting:*   * [F-102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-F-102.docx): Updated Call for Proposals: Use Cases, Benchmarking and Data * [F-106](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-F-106.docx): Guidelines on FG-AI4H online collaboration tools   *Remote consensus:*   * [F-103](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-F-103.docx): Updated FG-AI4H data acceptance and handling policy * [F-105](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-F-105.docx): ToRs for the WG-Experts and call for experts |
| 7 | Outcome of the workshop | | | [G-002](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-002.pptx) (Workshop Summary; Chair) |
| 8 | Review of incoming LSs | | | None |
| 9 | FG-AI4H deliverables | | | [G-031-R2](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-031-R02.docx) |
| 10 | Horizontal and strategic topics | | | [G-029](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-029.docx): Convergence of AI with blockchain technology in healthcare domain [MoC, India] |
| 11 | Working Group updates | | |  |
| a | | | Data and AI solution assessment methods (WG-DAISAM) [Pat Baird; Luis Oala] | [G-041](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-041.pptx) (Update)  [G-037](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-037.docx) (Qual. Criteria)  [G-038](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-038.pptx) + [A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-038-A01.xlsx) (Map IMDRF) |
| b | | | Data and AI solution handling (WG-DASH) [Marc Lecoultre; Ferhat Kerif] |  |
| c | | | Operations (WG-O) [Markus Wenzel] | [G-036](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-036.pptx): WG-O update  [G-035](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-035.docx): Onboarding document |
| d | | | Regulatory considerations on AI for health (WG-RC) [Naomi Lee] | [G-027](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-027.docx): Regulatory and ethical consideration for AI in health [MoC, India]  [G-033](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-033.docx): Evolving ethical and regulatory framework for AI4H [MoC, India] |
| e | | | *Health requirements (WG-HR) [Laragh Gollogly (WHO); Ramesh Krishnamurthy (WHO)]* |  |
| f | | | Ethics | **Draft ToR**: [G-034](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-034.docx) [Inspired Ideas, Tanzania; University of Oslo,Norway]  **Discussions**: [G-026](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-026.docx) Ethical issues in AI for Health [MoC, India] |
| 12 | Updates and new proposals for existing TGs | | |  |
| a | | TDD, CfTGP templates – updates needed? | | [C-105](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-105.docx) (TDD)  [F-004](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-F-004.docx) (CfTGP) |
| b | | TG-Cardio (Cardiovascular risk prediction)  [[Benjamin Muthambi](mailto:brm5@caa.columbia.edu)] | | CfTGP: [G-005-A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A01.docx)  TDD Update: [G-006](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-006.docx)  Contributions: [G-021](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-021.docx) [*Sub-topic Coronary CT*, ShinKun Technology, MIIT (China)] |
| c | | TG-Cogni (Neurocognitive diseases)  [[Marc Lecoultre](mailto:ml@bigps.ch)] | | CfTGP: [G-005-A02](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A02.docx)  TDD Update: [G-007](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-007.docx)  Contributions: |
| d | | TG-Bacteria (Diagnoses of bacterial infection and anti-microbial resistance) [[Nada Malou](mailto:nada.malou@paris.msf.org)] | | CfTGP: [G-005-A09](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A09.docx)  TDD Update: [[G-0](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-007.docx)15](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-007.docx)  Contributions: |
| e | | TG-Derma (Dermatology)  [[Maria Vasconcelos](mailto:maria.vasconcelos@fraunhofer.pt)] | | CfTGP: [G-005-A03](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A03.docx)  TDD Update: [G-008](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-008.docx)  Contributions: |
| f | | TG-DiagnosticCT (Volumetric chest computed tomography)  [[Kuan Chen](mailto:ckuan@infervision.com)] | | CfTGP: [G-005-A04](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A04.docx)  TDD Update: [G-009](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-009.docx)  Contributions: |
| g | | TG-Falls (Falls among the elderly)  [[Inês Sousa](mailto:ines.sousa@fraunhofer.pt)] | | CfTGP: [G-005-A05](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A05.docx)  TDD Update: [G-010](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-010.docx)  Contributions: |
| h | | TG-Histo (Histopathology)  [[Frederick Klauschen](mailto:frederick.klauschen@charite.de)] | | CfTGP: [G-005-A06](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A06.docx)  TDD Update: [G-011](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-011.docx)  Contributions: |
| i | | TG-Ophthalmo (Ophthalmology)  [[Arun Shroff](mailto:arunshroff@gmail.com)] | | CfTGP: [G-005-A07](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A07.docx)  TDD Update: [G-012](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-012.docx)  Contributions: [G-030-R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-030-R01.docx) [St. John's Medical College (India)], [G-028](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-028.docx) [Calligo Tech (India)] |
| j | | TG-Outbreaks (AI for outbreak detection) [[Stephane Ghozzi](mailto:GhozziS@rki.de), [Auss Abbood](mailto:AbboodA@rki.de)] | | CfTGP: [G-005-A13](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A12.docx)  TDD Update: [G-013](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-013.docx) + [A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-013-A01.pptx)  Contributions: [G-032](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-032.docx)\* [Azadur Rahman Sarker] |
| k | | TG-Malaria (Malaria detection)  [[Rose Nakasi](mailto:g.nakasirose@gmail.com)] | | CfTGP: [G-005-A14](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A14.docxhttps:/extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A12.docx)  TDD Update: [G-019](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-019.docx)  Contributions: |
| l | | TG-Psy (Psychiatry)  [[Nicholas Langer](mailto:n.langer@psychologie.uzh.ch)] | | CfTGP: [G-005-A08](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A08.docx)  TDD Update: [G-014](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-014.docx)  Contributions: |
| m | | TG-Radiotherapy (Radiotherapy)  [[Zhenzhou (Joe) WU](mailto:joe.wu@biomind.ai)] | | CfTGP: [G-005-A15](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A15.docx)  TDD Update: N/A  Contributions: |
| n | | TG-Snake (Snakebite and snake identification)  [[Rafael Ruiz](mailto:rafael.ruizdecastaneda@unige.ch)] | | CfTGP: [G-005-A10](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A10.docx)  TDD Update: [G-016](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-016.docx)  Contributions: |
| o | | TG-Symptom (Symptom assessment)  [[Henry Hoffmann](mailto:henry.hoffmann@ada.com)] | | CfTGP: [G-005-A11](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A11.docx)  TDD Update: [G-017](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-017.docx)  Contributions: |
| p | | TG-TB (Tuberculosis)  [[Manjula Singh](mailto:drmanjulasb@gmail.com)] | | CfTGP: [G-005-A12](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A12.docx)  TDD Update: [G-018](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-018.docx)  Contributions: |
| q | | TG-Growth (Child growth monitoring) [[Hafsa M. Mitwa](mailto:hafsa.m.mwita@gmail.com)] | | CfTGP: [G-005-A16](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A16.docx)  TDD Update: N/A  Contributions: |
| 13 | Proposals for new topic areas | | |  |
| a | | Dental diagnostics | | [G-020](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-020.docx) [Charité Berlin] |
| b | | AI-based detection of falsified medicine\* | | [G-022](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-022.docx) [TrueSpec-Africa] |
| c | | Radiograph-agnostic framework and platform | | [G-023](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-023.docx) [minoHealth AI Labs] |
| d | | Dengue surveillance | | [G-024](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-024.docx) [AIME (Malaysia)] |
| e | | Universal health coverage | | [G-039](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-039.docx) [Common Health (Malaysia)] |
| f | | Parkinson's disease | | [G-040](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-040.docx) [United International University (Bangladesh)] |
| g | | Others? | |  |
| 14 | Review / reconfirmation of previous output documents | | | * [FG-AI4H Whitepaper](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Documents/FG-AI4H_Whitepaper.pdf) * [F-102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-F-102.docx): Updated call for proposals: use cases, benchmarking, and data * [F-103](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-F-103.docx): Updated FG-AI4H data acceptance and handling policy * [C-104](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-104.docx): Thematic classification scheme * Templates? TDD ([C-105](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-C-105.docx)), CfTGP ([F-004](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-F-004.docx)) * Others? |
| 15 | Outcomes of this meeting | | | * New / extended / completed WGs * Output documents |
| 16 | Future work | | |  |
| a | | Schedule of future FG meetings and workshops | | Meeting schedule: [G-003-R1](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-003-R01.docx)  Workshop: [G-025](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-025.docx), Workshop on AI4H standardized assessment framework & handling and assessment methods Berlin, 8-9 Jan 2020 [WG-DASH; WG-DAISAM] |
| b | | Work plan and timeline | |  |
| c | | Interim activities (online) | |  |
| 17 | Promotion and outreach | | |  |
| a | | Promotional activities | |  |
| b | | Press communication | |  |
| c | | Funding and partnerships | |  |
| 18 | A.O.B. | | |  |
| 19 | Closing | | |  |

Annex B:  
Documentation

| Name[https://extranet.itu.int/_layouts/15/images/blank.gif?rev=40](javascript:) | Title[https://extranet.itu.int/_layouts/15/images/blank.gif?rev=40](javascript:)https://extranet.itu.int/_layouts/15/images/blank.gif?rev=40https://extranet.itu.int/_layouts/15/images/blank.gif?rev=40 | | Source[https://extranet.itu.int/_layouts/15/images/blank.gif?rev=40](javascript:)https://extranet.itu.int/_layouts/15/images/blank.gif?rev=40https://extranet.itu.int/_layouts/15/images/blank.gif?rev=40 | Note |
| --- | --- | --- | --- | --- |
| [FGAI4H-G-001-R02](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-001-R02.docx) | Agenda and documentation of the FG-AI4H meeting (New Delhi, 13-15 November 2019) | | FG-AI4H Chairman |  |
| [FGAI4H-G-002-R01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-002-R01.pptx) | Summary of the 7th Workshop of the Focus Gro Artificial Intelligence for Health | | TSB |  |
| [FGAI4H-G-003-R01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-003-R01.docx) | Schedule of future FG meetings (as of 2019-11-13) | | Chairman FG-AI4H |  |
| [FGAI4H-G-004](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-004.docx) | FG-AI4H Travel Grant Criteria | | FG-AI4H Secretariat |  |
| [FGAI4H-G-005](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005.docx) | Updated calls for participation issued by the various TGs | | TSB |  |
| [FGAI4H-G-005-A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A01.docx) | | Call for AI for Health Topic Group Participation: AI for Health Topic Group: Cardiovascular Disease (CVD) Risk Prediction [Same as Meeting E] | TG-Cardio topic driver |  |
| [FGAI4H-G-005-A02](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A02.docx) | | Call for Topic Group Participation: Standardized benchmarking of AI against neuro-cognitive diseases [Same as Meeting E] | TG-Cogni Driver |  |
| [FGAI4H-G-005-A03](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A03.docx) | | Call for Topic Group Participation: AI for Dermatology [Meeting E] | TG-Derma Topic Driver |  |
| [FGAI4H-G-005-A04](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A04.docx) | | Updated Call for Topic Group Participation: AI for Volumetric Chest Computed Tomography [Meeting F] | TG-DiagnosticCT Topic Driver |  |
| [FGAI4H-G-005-A05](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A05.docx) | | Call for Topic Group Participation: Standardized benchmarking of AI to prevent falls among the elderly [Same as Meeting E] | TG-Falls Driver |  |
| [FGAI4H-G-005-A06](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A06.docx) | | Call for Topic Group Participation: AI for Histopathology [Same as Meeting E] | TG-Histo topic driver |  |
| [FGAI4H-G-005-A07](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A07.docx) | | Updated Call for Topic Group Participation: Standardized benchmarking of AI for Ophthalmology (Retinal Imaging Diagnostics) | TG-Ophthalmo Driver |  |
| [FGAI4H-G-005-A08](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A08.docx) | | Call for Topic Group Participation: Standardized benchmarking of AI in Psychiatry [Same as Meeting E] | TG-Psy Driver |  |
| [FGAI4H-G-005-A09](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A09.txt) | | Withdrawn - CfTGP for TG-Bacteria | N/A | Withdrawn |
| [FGAI4H-G-005-A10](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A10.docx) | | Call for Topic Group Participation: Standardized benchmarking of "AI for Snakebite and Snake Identification" | TG-Snake Driver |  |
| [FGAI4H-G-005-A11](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A11.docx) | | Updated call for topic group participation: Standardized benchmarking of "AI-based symptom assessment" | TG-Symptom Driver |  |
| [FGAI4H-G-005-A12](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A12.docx) | | Call for Topic Group Participation: Standardized benchmarking of AI against Tuberculosis [Same as Meeting E] | TG-TB topic driver | Updated |
| [FGAI4H-G-005-A13](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A13.docx) | | Draft for a Call for Topic Group Participation: Standardized benchmarking of "AI for Outbreak Detection" [Same as Meeting F] | TG-Outbreaks topic driver |  |
| [FGAI4H-G-005-A14](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A14.docx) | | Call for Topic Group Participation: Standardized benchmarking of "AI for Malaria Detection" | TG-Malaria Topic Driver |  |
| [FGAI4H-G-005-A15](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A15.txt) | | Withdrawn - CfTGP for TG-Radiotherapy | N/A | Withdrawn |
| [FGAI4H-G-005-A16](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-005-A16.txt) | | Withdrawn - CfTGP for TG-Growth | N/A | Withdrawn |
| [FGAI4H-G-006](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-006.docx) + [A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-006-A01.pdf) | TDD update: TG-Cardio (Cardiovascular disease risk prediction) | | TG-Cardio topic driver |  |
| [FGAI4H-G-007](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-007.docx) + [A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-007-A01.pptx) | TDD Update: TG-Cogni (Neuro-cognitive diseases) [Same as Meeting F] | | TG-Cogni topic driver |  |
| [FGAI4H-G-008](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-008.docx) | TDD update: TG-Cogni (Neuro-cognitive diseases) - Att.1: Presentation [Same as Meeting F] | | TG-Derma topic driver | Reuploaded |
| [FGAI4H-G-009](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-009.docx) | TDD update: TG-DiagnosticsCT (Volumetric chest computed tomography) [Meeting F] | | TG-DiagnosticCT Topic Driver |  |
| [FGAI4H-G-010](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-010.docx) | TTD Update: TG-Falls (Falls among the elderly) | | TG-Falls topic driver |  |
| [FGAI4H-G-011](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-011.docx) | TDD Update: TG-Histo (Histopathology) [Same as Meeting E] | | TG-Histo topic driver |  |
| [FGAI4H-G-012](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-012.docx) + [A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-012-A01.pptx) | TDD update: TG-Ophthalmo (Ophthalmology) | | TG-Ophthalmo topic driver |  |
| [FGAI4H-G-013](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-013.docx) + [A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-013-A01.pptx), [A02](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-013-A02.pptx) | TDD (new): TG-Outbreaks (Outbreak detection) | | TG-Outbreaks topic driver |  |
| [FGAI4H-G-014](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-014.docx) + [A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-014-A01.pdf) | TDD update: TG-Psy (Psychiatry) | | TG-Psy topic driver |  |
| [FGAI4H-G-015](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-015.txt) | Withdrawn - TDD for TG-Bacteria | | N/A | Withdrawn |
| [FGAI4H-G-016](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-016.docx) + [A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-016-A01.pptx) | TDD update: TG-Snake (Snakebite and snake identification) | | TG-Snake topic driver |  |
| [FGAI4H-G-017](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-017.docx) + [A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-017-A01.pptx) | TDD update: TG-Symptom (Standardized Benchmarking for AI-based symptom assessment) | | TG-Symptom Topic Driver |  |
| [FGAI4H-G-018](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-018.docx) | TDD update: TG-TB (Tuberculosis) | | TG-TB topic driver |  |
| [FGAI4H-G-019](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-019.docx) | Initial TDD: TG-Malaria (Malaria detection) | | TG-Malaria topic driver |  |
| [FGAI4H-G-020](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-020.docx) + [A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-020-A01.pptx) | New Topic Group: Dental Diagnostics | | Charité – Universitätsmedizin Berlin Germany |  |
| [FGAI4H-G-021](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-021.docx) | TG-Cardio: Input for sub-topic - General framework of development and evaluation of artificial intelligence in coronary computed tomography angiography | | ShinKun Technology, MIIT (China) |  |
| [FGAI4H-G-022](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-022.docx) | New Topic Group: AI-based detection of falsified medicine | | TrueSpec-Africa |  |
| [FGAI4H-G-023](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-023.docx) | New Topic Group: A Standardized radiograph-agnostic framework and platform for evaluating AI radiological systems | | minoHealth AI Labs |  |
| [FGAI4H-G-024](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-024.docx) + [A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-024-A01.pptx) | New Topic Group: Utilizing AI as a Dengue dynamic surveillance and forecasting tool | | AIME (Malaysia) |  |
| [FGAI4H-G-025](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-025.docx) | Invitation to Workshop on AI4H standardized assessment framework & handling and assessment methods from 8 to 9 Jan 2020 in Berlin, Germany | | WG-DASH Chair; WG-DAISAM Vice Chair |  |
| [FGAI4H-G-026](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-026.docx) | Ethical issues in AI for Health | | Ministry of Communications (India) |  |
| [FGAI4H-G-027](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-027.docx) | Regulatory and ethical consideration for AI in health | | Ministry of Communications (India) |  |
| [FGAI4H-G-028](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-028.docx) | TG-Ophthalmo: Input for sub-topic - Leveraging Edge analytics and Artificial Intelligence for the rapid assessment of avoidable blindness | | Calligo Technologies (India) |  |
| [FGAI4H-G-029](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-029.docx) | Convergence of AI with blockchain technology in healthcare domain | | Ministry of Communications (India) |  |
| [FGAI4H-G-030-R01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-030-R01.docx) | TG-Ophthalmo: Proposal for sub-topic - AI based Aetiological Classification of Red Eye | | St. John’s Medical College (India) |  |
| [FGAI4H-G-031-R02](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-031-R02.docx) | FG-AI4H deliverables | | FG-AI4H Chairman |  |
| [FGAI4H-G-032](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-032.docx) | TG-Outbreaks: Infectious disease outbreak predicting using deep learning | | Azadur Rahman Sarker |  |
| [FGAI4H-G-033](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-033.docx) | WG-RC: Evolving ethical and regulatory framework for AI4H | | Ministry of Communications (India) |  |
| [FGAI4H-G-034](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-034.docx) | Draft ToR for a FG-AI4H Working Group on Ethics (WG-Ethics) | | Inspired Ideas (Tanzania), University of Oslo (Norway) |  |
| [FGAI4H-G-035-R01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-035-R01.docx) | Draft: Onboarding document-ITU/WHO Focus Group on "AI for Health" | | WG-Operations Chair |  |
| [FGAI4H-G-036](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-036.pptx) | WG-O updates (onboarding document and online collaboration tools) | | Chair WG Operations |  |
| [FGAI4H-G-037](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-037.docx) | Regulatory review: six quality criteria for data and AI solution assessment | | WG DAISAM chairs |  |
| [FGAI4H-G-038](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-038.docx) + [A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-038-A01.xlsx) | Mapping of IMDRF essential principles to AI for health software (A01: Spreadsheets for cluster creation) | | WG-DAISAM, FG-AI4H Chair |  |
| [FGAI4H-G-039](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-039.docx) | New TG on Universal Health Coverage | | Common Health (Malaysia) |  |
| [FGAI4H-G-040](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-040.docx) + [A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-040-A01.pptx) | Proposal for new topic group: AI based Parkinson's disease (PD) screening and management | | United International University (Bangladesh) |  |
| [FGAI4H-G-041](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-041.pptx) | WG-DAISAM update | | WG-DAISAM Chair |  |
| [FGAI4H-G-042](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-042.docx) | Initial TDD: Dental diagnostics and digital dentistry | | TG-Dental topic driver |  |
| [FGAI4H-G-043](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-043.docx) | Initial TDD: TG-MCH (Maternal and child health) | | TG-MCH topic driver |  |
| [FGAI4H-G-101](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-102.docx) | Report of the 7th meeting (Meeting G) of the Focus Group on Artificial Intelligence for Health (New Delhi, 13-15 November 2019) | | FG-AI4H |  |
| [FGAI4H-G-102](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-102.docx) | Updated call for proposals: Use cases, benchmarking, and data | | FG-AI4H |  |
| [FGAI4H-G-107](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-107.docx) | Onboarding document for the ITU/WHO Focus Group on AI for Health | | FG-AI4H |  |
| [FGAI4H-G-200-R01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-200-R01.docx) | List of planned FG-AI4H deliverables | | FG-AI4H |  |

Reserved numbers for deliverable documents (see §9):

| Name | Title | | Source | Note |
| --- | --- | --- | --- | --- |
| [FGAI4H-G-201](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-201.docx) | DEL01: AI4H ethics considerations | | [Andreas Reis](mailto:reisa@who.int) (WHO),  [Julia Mohapatra](mailto:juliam24@gmail.com) (NICF, India) |  |
| [FGAI4H-G-202](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-202.docx) | DEL02: AI4H regulatory best practices | | [Jackie Ma](mailto:jackie.ma@hhi.fraunhofer.de) (Franhofer HHI, Germany) | Uploaded |
| [FGAI4H-G-203](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-203.docx) | DEL03: AI4H requirements specification | | [Pradeep Balachandran](mailto:abn.tvm@gmail.com), [Tina Purnat](mailto:purnatt@who.int) (WHO) |  |
| [FGAI4H-G-204](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-204.docx) | DEL04: AI software life cycle specification | | [Pat Baird](mailto:pat.baird@philips.com) (Philips, USA),  [Tina Purnat](mailto:purnatt@who.int) (WHO) |  |
| [FGAI4H-G-205](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-205.docx) | DEL05: Data specification | | [Marc Lecoultre](mailto:ml@bigps.ch) (Business Investigation, Switzerland) |  |
| [FGAI4H-G-205-A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-205-A01.docx) | | DEL05.a: Data requirements | [Gupta Saurabh](mailto:drsaurabhmd@gmail.com) (AIIMS, India),  [Manjula Singh](mailto:singhmanjula.hq@icmr.gov.in) (ICMR, India) |  |
| [FGAI4H-G-205-A02](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-205-A02.docx) | | DEL05.b: Data acquisition | [Rajaraman (Giri) Subramanian](mailto:kinnal@hotmail.com) (Calligo Tech, India),  [Vishnu Ram](mailto:vishnu.n@ieee.org) (India) |  |
| [FGAI4H-G-205-A03](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-205-A03.docx) | | DEL05.c: Data annotation specification | [Shan Xu](mailto:xushan@caict.ac.cn) (CAICT, China),  [Harpreet Singh](mailto:hsingh@bmi.icmr.org.in) (ICMR, India) |  |
| [FGAI4H-G-205-A04](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-205-A04.docx) | | DEL05.d: Training and test data specification | [Luis Oala](mailto:luis.oala@hhi.fraunhofer.de) (Franhofer HHI, Germany),  [Pradeep Balachandran](mailto:abn.tvm@gmail.com) (India) |  |
| [FGAI4H-G-205-A05](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-205-A05.docx) | | DEL05.e: Data handling | [Marc Lecoultre](mailto:ml@bigps.ch) (Business Investigation, Switzerland) |  |
| [FGAI4H-G-205-A06](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-205-A06.docx) | | DEL05.f: Data sharing practices | [Ferath Kherif](mailto:Ferath.Kherif@chuv.ch) (CHUV, Switzerland),  [Banusri Velpandian](mailto:banushrir@gmail.com) (ICMR, India),  WHO Data Team |  |
| [FGAI4H-G-206](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-206.docx) | DEL06: AI training best practices specification | | [Ma Su Su](mailto:susu@aisingapore.org) and [Stefan Winkler](mailto:stefan@aisingapore.org) (AI Singapore) |  |
| [FGAI4H-G-207](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-207.docx) | DEL07: AI4H evaluation specification | | [Markus Wenzel](mailto:markus.wenzel@hhi.fraunhofer.de) (Fraunhofer HHI, Germany) |  |
| [FGAI4H-G-207-A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-207-A01.docx) | | DEL07.a: AI4H evaluation process description | [Sheng Wu](mailto:wus@who.int) (WHO) |  |
| [FGAI4H-G-207-A02](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-207-A02.docx) | | DEL07.b: AI technical test specification | [Auss Abbood](mailto:abbooda@rki.de) (Robert Koch Institute, Germany) |  |
| [FGAI4H-G-207-A03](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-207-A03.docx) | | DEL07.c: AI technical test metric specification | [Luis Oala](mailto:luis.oala@hhi.fraunhofer.de) (Fraunhofer HHI, Germany) |  |
| [FGAI4H-G-207-A04](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-207-A04.docx) | | DEL07.d: Clinical validation | [Naomi Lee](mailto:naomi.lee@lancet.com) (Lancet, UK),  [Manjula Singh](mailto:singhmanjula.hq@icmr.gov.in) (ICMR, India),  [Rupa Sarkar](mailto:rupa.sarkar@lancet.com) (Lancet, UK) |  |
| [FGAI4H-G-208](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-208.docx) | DEL08: AI4H post-market surveillance/adaptation specification | | [Sameer Pujari](mailto:pujaris@who.int) (WHO) |  |
| [FGAI4H-G-209](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-209.docx) | DEL09: AI4H applications and platforms | | [Manjeet Chalga](mailto:chalgams.hq@icmr.gov.in) (ICMR, India),  [Aveek De](mailto:aveek@cms-india.org) (CMS, India) |  |
| [FGAI4H-G-209-A01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-209-A01.docx) | | DEL09.a: Mobile applications | [Khondaker Mamun](mailto:mamun@cse.uiu.ac.bd) (UIU, Bangladesh),  [Manjeet Chalga](mailto:chalgams.hq@icmr.gov.in) (ICMR, India) |  |
| [FGAI4H-G-209-A02](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-209-A02.docx) | | DEL09.b: Cloud-based AI applications | [Khondaker Mamun](mailto:mamun@cse.uiu.ac.bd) (UIU, Bangladesh) |  |
| [FGAI4H-G-210](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-210.docx) | DEL10: AI4H use cases: Topic description documents | | [Eva Weicken](mailto:eva.weicken@hhi.fraunhofer.de) (Fraunhofer HHI, Germany) |  |

Annex C:  
List of participants

| Last Name | First Name | Entity | Country | 12-Nov | 13-Nov | 14-Nov |
| --- | --- | --- | --- | --- | --- | --- |
| AB | Divya | Director, DoT | India | Present | – | – |
| Abbood | Auss | Robert Koch Institute | Germany | Remote | Remote | Remote |
| AC | Chetan | – | India | Remote | – | – |
| Adel | Aminullah | Afghanistan Telecom Regulatory Authority (ATRA) | Afghanistan | Present | Present | Present |
| Agarwal | Shashank | NICF | India | Present | – | – |
| Aggarwal | Anjali | Senior Consultant Radiologist, Teleradiology Solutions | India | Present | – | – |
| Agrawal | Anurag | IGIB | India | Present | – | – |
| Ahmad | Faisal | Tech Corp International Strategist (TCIS) | India | Present | Present | – |
| Ahmadzai | Sher Khan | Afghanistan Telecom Regulatory Authority (ATRA) | Afghanistan | – | Present | Present |
| Akhtar | Furqan | Probationer, IPTAPS | India | Present | – | – |
| Alen Vikas | A. | ADET ITS | India | Present | – | – |
| Allen | Megan | Inspired Ideas | Tanzania | Present | Present | Present |
| Ana Soloman | Irin | ICMR | India | Present | – | – |
| Anupriya | S. | Technology Strategist, Start Up India | India | Present | – | – |
| Apte | Neeraj | Avegen India Pvt Ltd | India | Present | – | – |
| Arora | Manish | – | – | Remote | – | – |
| Awladthani | Badar | System Applications | India | Present | – | – |
| Awladthani | Pradeep | MoH&W | India | – | Present | Present |
| Bakshi | Ajay | BuddhiMed Technologies | India | Present | – | – |
| Balachandran | Pradeep | Guest | Switzerland | Present | Present | Present |
| Banzal | Preeti | Ministry of Communications | India | Present | Present | Present |
| Barandas | Marilia | Start-up/individual | – | – | – | Remote |
| Berger | Rainer | AI Singapore | Singapore | Present | Present | Present |
| Bhardwaj | Shshank | Probationer, IPTAPS | India | Present | – | – |
| Brahmachari | Sk | Former DG (CSIR) and Secretary GOI | India | Present | – | – |
| Chronaki | Catherine | HL7 Foundation | Belgium | Remote | – | – |
| Cuenat | Alexandre | Wellcome Trust | United Kingdom | Remote | Remote | Remote |
| Dabiri | Ayda | ITU | Switzerland | Remote | – | – |
| Dagur | Brahamanad | Programmer | India | Present | – | – |
| De | Aveek | Catalyst Foundation | India | Present | Present | – |
| De Campos Neto | Simão Ferraz | ITU | Switzerland | Present | Present | Present |
| Dharmaraju | Raghu | Wadhwani AI | India | Present | – | – |
| Dhingra Khurana | Sonal | ICMR | India | Present | – | – |
| Diwakar | Ashutosh | ADET | India | Present | – | – |
| Durani | Sandeep | Senior Manager, HPE | India | Present | – | – |
| Durso | Andrew | Université de Genève | Switzerland | – | – | Remote |
| Ferrante Di Ruffano | Lavinia | Start-up/individual | – | Remote | – | – |
| Gautam | Piyush | ICMR | India | Present | – | – |
| Guilford | Matthew | Common Health | Malaysia | Present | – | – |
| Gunda | Srinivas | M - Fine | India | Present | – | – |
| Gupta | Manish Kumar | Ministry of Communications | India | Present | – | – |
| Gupta | Saurabh Kumar | Ministry of Communications | India | Present | Present | Present |
| Hoffmann | Henry | Ada Health GmbH | Germany | Present | Present | Present |
| Iqbal | Zafar | Probationer, IPTAPS NICF | India | Present | – | – |
| Jadeja | Dushyantsinh | Google | India | Present | Present | Present |
| Jain | Neeraj | PATH | India | Present | – | – |
| Jayakody | Harsha | MyDoctor | Sri Lanka | Present | Present | Present |
| John | Oommen | The George Institute for Global Health | India | Present | – | – |
| John | Sheila | Sankara Nethralaya | India | Remote | Remote | Remote |
| Johri | Saurabh | Start-up/individual | United Kingdom | – | Present | Present |
| Jr Salim | Ally | CEO, Inspired Ideas | Tanzania | Present | – | – |
| Kadam | Rigveda | Foundation for Innovative New Diagnostic | Switzerland | Remote | – | – |
| Kannan | Nandini | Indo - U.S. Science & Technology Forum (IUSSTF) | India | Present | – | – |
| Kapoor | Mudit | Associate Professor, Indian Statistical Institute | India | Present | – | – |
| Kherif | Ferath | CHUV | Switzerland | Remote | Remote | Remote |
| Kodan | Parul | Ministry of Communications | India | – | Present | Present |
| Krois | Joachim | Charité - Universitätsmedizin Berlin | Germany | Present | Present | Present |
| Kuglitsch | Monique | Fraunhofer HHI | Germany | Remote | Remote | Remote |
| Kumar | Sushil | Ministry of Communications | India | Present | Present | Present |
| Kumar | Ashwani | DoT | India | Present | – | – |
| Kumar | Jitendra | Senior Programmer | India | Present | – | – |
| Kumar | Rohit | Student | India | Present | Present | Present |
| Kumar | Sarvijit | Probationer, IPTAPS | India | Present | – | – |
| Kumar | Sumit | Probationer, IPTAPS | India | Present | – | – |
| Kumar | Vijay | Head BMS, ICMR | India | Present | – | – |
| Kumar Gupta | Sanjeev | Technician C, ICMR - NIMR | India | Present | – | – |
| Kumar Kadel | Ajay | Nepal Telecom (Nepal Doorsanchar Company Limited) | Nepal | Remote | – | – |
| Kundu | Indra | Start-up/individual | – | Remote | – | – |
| Langer | Nicolas | University of Zurich | Switzerland | – | – | Remote |
| Lecoultre | Marc | Business Investigation SA | Switzerland | Present | Present | Present |
| Lee | Naomi | The Lancet | United Kingdom | Present | Present | Present |
| Lingappa | Rakesh | Jain Institute of Technology | India | – | Remote | Remote |
| Lynn | Andrew | Professor, JNU | India | Present | – | – |
| Ma | Jackie | Fraunhofer HHI | Germany | Present | Present | Present |
| Mahajan | Vidur | Head R&D, Caring | India | Present | – | – |
| Mamun | Khondaker Abdhullah Al | CMED Health | Bangladesh | Present | Present | Present |
| Mathur | Roli | Indian Council of Medical Research | India | Present | – | – |
| Mc | Sathish Kumar | Ministry of Communications | India | Remote | Remote | Remote |
| Meena | Rajmohan | Ministry of Communications | India | Present | Present | Present |
| Mitra | Urvashi | Population Foundation of India | India | Present | – | – |
| Mohapatra | Julia | NICF | India | – | Present | Present |
| Mrinal | Mayank | Ministry of Communications | India | – | Present | Present |
| Mukherjee | Shoma | Assistant Professor | India | Present | – | – |
| Muthambi | Benjamin | IEPH (Consultant to WatifHealth) | United States | – | – | Remote |
| Muthuswamy | Vasantha | FERCI(Forum for Ethics Review Committees | India | Present | – | – |
| Nakasi | Rose | Makerere University | Uganda | Remote | Remote | Remote |
| Negi | Mayank | IPTAPS | India | Present | – | – |
| Neumark | Tom | University of Oslo | Norway | Remote | Remote | Remote |
| Nim | Devendra Kumar | Ministry of Communications | India | – | Present | – |
| Oala | Luis | Fraunhofer HHI | Germany | Present | Present | Present |
| Pal | B.G. | Dure Technologies | India | Present | – | – |
| Palumbo | Pierpaolo | University of Bologna | Italy | – | Remote | Remote |
| Parshad | Mahabir | Ministry of Communications | India | Present | – | – |
| Parvez | Aazam | HPE | India | Present | – | – |
| Pathak | Shantanu | CareMother | India | Present | – | – |
| Paul | V.K. | NITI Aayog | India | Present | – | – |
| Paul | Rohan | Professor, IIT Delhi | India | Present | – | – |
| Perov | Yura | Babylon Health | United Kingdom | Present | Present | Present |
| Porwal | Surbhi | Start-up/individual | – | Remote | – | – |
| Potocanac | Zrinka | Ericsson Nikola Tesla d.d. | Croatia | Remote | – | – |
| Prasad Shah | Arvind | Assistant (ITRC), ICMR | India | Present | – | – |
| Prasam Kumari | Maddipatta | Probationer (NICF) | India | Present | – | – |
| Priya | S. Anu | Tech Corp International Strategist | India | – | Present | – |
| Pujari | Sameer | WHO HQ | Switzerland | Present | Present | Present |
| Quaiser | Raunaque | STMicroelectronics | India | Present | – | – |
| Quast | Bastiaan | ITU | Switzerland | Present | Present | Present |
| Rai | Ayush | Probationer, IPTAPS | India | Present | – | – |
| Raj | Divya | International Institute of Information Technology, Bangalore | India | Remote | – | – |
| Ram | Parvathi | St John's Medical College | India | Present | Present | Present |
| Ram Omanakutty Amma Vijayaraghavan Nair | Vishnu | Start-up/individual | India | Present | Present | Present |
| Ramakrishnan | Srinivaran | CDAC | India | Present | – | – |
| Ranjan | Manish | Ministry of Communications | India | Present | – | Present |
| Ranjan | Dhananjay | Director, DoT | India | Present | – | – |
| Rao | Sriganesh | Calligo Technologies Private Limited | India | – | Present | Present |
| Rao | Anjali | SRA | India | Present | – | – |
| Rao | Jyoti | HR Head, HM Clause | India | Present | – | – |
| Rao | Krishtive | Consultant | India | Present | – | – |
| Rao | Narayana | CEO, Salcit Technologies | India | Present | – | – |
| Rao | Pooja | Head R&D, Qure AI | India | Present | – | – |
| Rao | Songesh | MD | India | Present | – | – |
| Rao | Vishnu | NIMS | India | Present | – | – |
| Rasaily | Reeta | Scientist F, ICMR | India | Present | – | – |
| Rigzin | Wangda | – | – | Remote | – | – |
| Romsha | Romsha | Tech Corp International Strategist | India | Present | – | – |
| Roy | Debanshu | University of Chicago trust | India | Present | – | – |
| Roy | Rajeev | Indian Council of Medical Research | India | Present | – | Present |
| Roy | Debanshu | University of Chicago | United States | Present | – | – |
| Salim | Ally Jr | Inspired Ideas | Tanzania | – | Present | Present |
| Sarker | Azadur | Bangladesh Telecommunication Regulatory Commission (BTRC) | Bangladesh | Remote | Remote | Remote |
| Schwendicke | Falk | Charité – Universitätsmedizin Berlin | Germany | – | Remote | – |
| Sen | Nidhi | Nivi | India | Present | – | – |
| Sethi | Tavpritesh | Assistant Professor, IIT Delhi | India | Present | – | – |
| Shaikh | Rizwan | Population Foundation Of India | India | Present | – | – |
| Shariff | A. | Professor | India | Present | – | – |
| Sharma | R.S | Indian Council of Medical Research | India | Present | – | – |
| Sharma | Shailendra K | Ministry of Communications | India | – | Present | – |
| Sharma | Vishwakirti | Trackmybeat Healthcare I Pvt. Ltd. | India | – | Remote | – |
| Sharma | Yukti | University of Chicago Trust | India | Present | – | – |
| Sharma | Bhavesh | Officer Trainer, IPTAPS | India | Present | – | – |
| Sharma | Sk | DDG (SM) | India | Present | – | – |
| Sharma | Vk | - | India | Present | – | – |
| Sherkhan | – | IT Admin | India | Present | – | – |
| Shivesh | Sanjeev | Founder and CEO, Entrepreneurship School | India | Present | – | – |
| Shokeen | Pooja | IPTAPS | India | Present | – | – |
| Shroff | Arun | Xtend.AI | United States | – | – | Remote |
| Shuaib | Haris | – | – | – | Remote | Remote |
| Sijwan | Muthu | CEO, IIT(Madras) | India | Present | – | – |
| Singaram | Muthu | IIT Madars | India | – | Present | – |
| Singh | Mandeep | Ministry of Communications | India | – | Present | – |
| Singh | Namrata | Ministry of Communications | India | – | Present | Present |
| Singh | Prashant | LIG LLC | United States | Present | – | – |
| Singh | Shekhar | Ministry of Communications | India | – | Present | – |
| Singh | Sumit | Ministry of Communications | India | Present | – | – |
| Singh | Arpita | Co-Founder and CEO, Docturnal | India | Present | – | – |
| Singh | Harpreet | Head ISRM, ICMR | India | Present | – | – |
| Singh | Manjula | Scientist E, ICMR | India | Present | Present | Present |
| Singh Chalga | Amanpreet | Student | India | Present | Present | Present |
| Singh Chalga | Manjeet | Scientist C, ICMR | India | Present | Present | Present |
| Singh Negi | Deepak | ICMR | India | Present | – | – |
| Sinha | Manish | NICF | India | Present | Present | Present |
| Sinha | Chaitali | Psychologist | India | Present | – | – |
| Sinha | P.K. | Member (Finance) | India | Present | Present | – |
| Sipula | Nao | Watif Health IIC | South Africa | – | – | Remote |
| Sousa | Ines | Associação Fraunhofer Portugal Research | Portugal | – | Remote | Remote |
| Srivastava | Anurag | NICF | India | – | Present | Present |
| Srivastava | Ashish | Advisor, Evaluation and Research Jhpiego | India | Present | – | – |
| Subodh | Swati | India Health Fund | India | Present | Remote | – |
| Subramanian | Rajaraman | Calligo Technologies Private Limited | India | Present | Present | Present |
| Suvrankar | Datta | JIPMER | India | Remote | – | – |
| Swaminathan | Soumya | World Health Organization | Switzerland | Remote | – | – |
| Tak | Amanullah | Ministry of Communications | India | Present | – | – |
| Talwar | Deepak | National Security Officer, Microsoft | India | Present | – | – |
| Taneja | Neha | ICMR | India | Present | – | – |
| Thakur | Ratna | Ministry of Communications | India | Present | Present | Remote |
| Tikrewal | Mukund | NICF | India | Present | – | – |
| Tiwari | Saurabh | Joint Secretary (Cabinet Secretariat) | India | Present | – | – |
| Toteja | G.S. | Additional DG & Head Nutrition, ICMR | India | Present | – | – |
| Tripathy | Srikanth | Director, ICMR – NIRT Chennai | India | Present | – | – |
| Turuk | Alka | Project Coordinator (NTBPS), ICMR | India | Present | Present | Present |
| Tyagi | Deepa | Ministry of Communications | India | Present | – | Present |
| Tyagi | Rajeev Kumar | Ministry of Communications | India | – | Present | – |
| Unger | Banappa S | – | – | Remote | – | – |
| Upadhyay | Shubhanan | Ada Health GmbH | Germany | Present | Present | Present |
| Vasconcelos | Maria | Associação Fraunhofer Portugal Research | Portugal | – | – | Remote |
| Velpandian | Banusri | Legal Advisor (ITRC), ICMR | India | Present | – | – |
| Venugopal | Vastna | Head Imaging Research, Caring | India | Present | Present | – |
| Verma | Abhinav | University of Chicago Trust | India | Present | – | – |
| Verzefé | Franck | TrueSpec Africa | DR Congo | – | – | Remote |
| Vivekanand Reddy | C | CTO | India | Present | – | – |
| Weicken | Eva | Fraunhofer HHI | Germany | Present | Present | Present |
| Wenzel | Markus | Fraunhofer HHI | Germany | Present | Present | Present |
| Wiegand | Thomas | Fraunhofer HHI | Germany | Present | Present | Present |
| Yadav | Vivek | Jhpiego | India | Present | – | – |
| Zakariah | Mohd Helmi Bin | AIME Healthcare | Malaysia | Present | Present | – |

NOTE – Additional 16 remote participants were only partially identifiable:

| Last Name | First Name | Entity | Country | 12-Nov | 13-Nov | 14-Nov |
| --- | --- | --- | --- | --- | --- | --- |
|  | Abhilash | Probationer, IPTAPS | India | Present |  |  |
|  | Deepanshu | Probationer, IPTAPS | India | Present |  |  |
|  | Jitendra | ADET ITS | India | Present |  |  |
|  | Naveen | ADET ITS | India | Present |  |  |
|  | Neeru | Probationer (NICF) | India | Present |  |  |
|  | Nishta | Researcher | India | Present |  |  |
|  | Rashi | Patent Associate, TCIS | India | Present |  |  |
|  | Sherkhan | IT Admin | India | Present |  |  |
|  | Shivam | NICF | India | Present |  |  |
|  | Anirudha |  | India | Remote |  |  |
|  | Redmi |  | India | Remote |  |  |
|  | Satisha |  | India | Remote |  |  |
|  | Subhajit |  | India | Remote |  |  |
|  | Anushikha |  |  |  |  | Remote |
|  | Vasanth |  |  |  | Remote |  |
|  | Vishnu |  |  |  | Remote | Remote |

Annex D  
Summary of FG-AI4H resources

Working groups ([ToRs](https://itu.int/en/ITU-T/focusgroups/ai4h/Pages/wg.aspx))

| Working Group | Leadership |
| --- | --- |
| Data and AI solution assessment methods (WG-DAISAM) | Chair: Pat Baird (Philips) Vice-chair: Luis Oala (Fraunhofer HHI, DE) |
| Data and AI solution handling (WG-DASH) | Chair: Marc Lecoultre (Business Investigation, CH) Vice chair: Ferhat Kerif (CHUV, CH) |
| Operations (WG-O) | Chair: Markus Wenzel (Fraunhofer HHI, Germany) |
| Regulatory considerations on AI for health (WG-RC) | Chair: Naomi Lee (The Lancet, UK)  Vice-chairs:   * Paolo Alcini (European Medicines Agency, EU) * Chandrashekar Ranga (CDSCO, India) * Khair ElZarrad (FDA, USA) * Wolfgang Lauer (Federal Institute for Drugs and Medical Devices, Germany) * Peng Liang (National Medical Products Administration, China) |
| Clinical Evaluation (WG-CE) | N/A |
| Ethics (WG-Ethics) | N/A |

Topic Groups

| Topic group | Acronym | Leader | References |
| --- | --- | --- | --- |
| 1. Cardiovascular disease risk prediction | TG-Cardio | [Benjamin Muthambi](mailto:brm5@caa.columbia.edu) (WatIF Health, South Africa) | [CfTGP](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Documents/tg/CfP-TG-Cardio.pdf) - [TDD](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-006.docx) |
| 1. Dermatology | TG-Derma | [Maria Vasconcelos](mailto:maria.vasconcelos@fraunhofer.pt) (Fraunhofer Portugal) | [CfTGP](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Documents/tg/CfP-TG-Derma.pdf) - [TDD](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-008.docx) |
| 1. Falls among the elderly | TG-Falls | [Inês Sousa](mailto:ines.sousa@fraunhofer.pt) (Fraunhofer Portugal) | [CfTGP](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Documents/tg/CfP-TG-Falls.pdf) - [TDD](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-010.docx) |
| 1. Histopathology | TG-Histo | [Frederick Klauschen](mailto:frederick.klauschen@charite.de) (Charite Berlin, Germany) | [CfTGP](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Documents/tg/CfP-TG-Histo.pdf) - [TDD](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-011.docx) |
| 1. Neurological disorders | TG-Neuro | [Marc Lecoultre](mailto:ml@bigps.ch) (Business Investigation, Switzerland) | [CfTGP](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Documents/tg/CfP-TG-Neuro.pdf) - [TDD](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-007.docx) |
| 1. Outbreak detection | TG-Outbreaks | [Stephane Ghozzi](mailto:GhozziS@rki.de), [Auss Abbood](mailto:abbooda@rki.de) (Robert Koch Institute, Germany) | [CfTGP](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Documents/tg/CfP-TG-Outbreaks.pdf) - [TDD](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-013.docx) |
| 1. Ophthalmology (retinal imaging diagnostics) | TG-Ophtalmo | [Arun Shroff](mailto:arunshroff@gmail.com) (MedIndia, India) | [CfTGP](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Documents/tg/CfP-TG-Ophthalmo.pdf) - [TDD](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-012.docx) |
| 1. Psychiatry | TG-Psy | [Nicholas Langer](mailto:n.langer@psychologie.uzh.ch) (ETH Zurich, Switzerland) | [CfTGP](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Documents/tg/CfP-TG-Psy.pdf) - [TDD](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-014.docx) |
| 1. Snakebite and snake identification | TG-Snake | [Rafael Ruiz](mailto:rafael.ruizdecastaneda@unige.ch) (UniGe, Switzerland) | [CfTGP](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Documents/tg/CfP-TG-Snake.pdf) - [TDD](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-016.docx?d=w9f502318f0b3479487906e0081cb53f7) |
| 1. Symptom assessment | TG-Symptom | [Henry Hoffmann](mailto:henry.hoffmann@ada.com) (Ada Health, Germany) | [CfTGP](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Documents/tg/CfP-TG-Symptom.pdf) - [TDD](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-017.docx) |
| 1. Tuberculosis | TG-TB | [Manjula Singh](mailto:singhmanjula.hq@icmr.gov.in) (ICMR, India) | [CfTGP](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Documents/tg/CfP-TG-TB.pdf) - [TDD](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-018.docx) |
| 1. Volumetric chest computed tomography | TG-DiagnosticCT | [Kuan Chen](mailto:ckuan@infervision.com) (InferVision, China) | [CfTGP](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Documents/tg/CfP-TG-DiagnosticCT.pdf) - [TDD](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-009.docx) |
| 1. Diagnoses of bacterial infection and anti-microbial resistance | TG-Bacteria | [Nada Malou](mailto:nada.malou@paris.msf.org) (Médecins Sans Frontières, France) | [Proposal](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-F-033.docx) |
| 1. Dental diagnostics and digital dentistry | TG-Dental | [Falk Schwendicke](mailto:falk.schwendicke@charite.de), [Joachim Krois](mailto:Joachim.krois@charite.de) (Charité Berlin, Germany) | [CfTGP](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Documents/tg/CfP-TG-Dental.pdf) - [TDD](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-H-010-A01.docx) |
| 1. AI-based detection of falsified medicine | TG-FakeMed | [Franck Verzefé](mailto:fverzefe@gmail.com) (TrueSpec-Africa, DRC) | [CfTGP](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Documents/tg/CFP-TG-FakeMed.pdf) |
| 1. Malaria detection | TG-Malaria | [Rose Nakasi](mailto:g.nakasirose@gmail.com) (Makerere University, Uganda) | [CfTGP](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Documents/tg/CfP-TG-Malaria.pdf) - [TDD](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-019.docx) |
| 1. Maternal and child health | TG-MCH | [Raghu Dharmaraju](mailto:rdharmaraju@gmail.com) (Wadhwani AI, India), [Hafsa M. Mitwa](mailto:hafsa.m.mwita@gmail.com) (Zanzibar University, Tanzania) | [TDD](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-G-043.docx) |
| 1. Radiotherapy | TG-Radio | [Zhenzhou (Joe) Wu](mailto:joe.wu@biomind.ai) (BioMind, China) | [Proposal](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-D-018.docx) |

Mailing lists

| Description | Mailing list | Archive |
| --- | --- | --- |
| General mailing list | [fgai4h@lists.itu.int](mailto:fgai4h@lists.itu.int) | <https://itu.int/ml/lists/arc/fgai4h> |
| TG-Ophtalmo | [fgai4htgophthalmo@lists.itu.int](mailto:fgai4htgophthalmo@lists.itu.int) | <https://itu.int/ml/lists/arc/fgai4htgophthalmo> |
| TG-Outbreaks | [fgai4htgoutbreaks@lists.itu.int](mailto:fgai4htgoutbreaks@lists.itu.int) | <https://itu.int/ml/lists/arc/fgai4htgoutbreaks> |
| TG-Symptoms | [fgai4htgsymptom@lists.itu.int](mailto:fgai4htgsymptom@lists.itu.int) | <https://itu.int/ml/lists/arc/fgai4htgsymptom> |

NOTE – Subscription to the FG-AI4H can be requested at the following link: <http://itu.int/go/fgai4h/lists>. A free ITU account is required (the same one used to register for meetings and to access the meeting documentation).

Decision making by correspondence [E-101 §13.2]

Decisions should preferably be taken in physical meetings of the FG. However, in order to allow the FG to work more efficiently, an online decision-making process would be useful.

The FG agreed to an online approval process for taking decisions (e.g. appointments and documentation). The initial procedure is as follows:

* Decisions are taken by consensus. (Note: consensus is declared by the chairman and it does *not* imply unanimity.)
* The general FG mailing list ([fgai4h@lists.itu.int](mailto:fgai4h@lists.itu.int)) is used to announce the decision being taken, provide links to relevant documents.
* Specify a commenting period, typically two weeks, for receiving comments with concerns. These comments should be addressed by email to the secretariat, [tsbfgai4h@itu.int](mailto:tsbfgai4h@itu.int). Absence of comments imply agreement to the proposed decision.
* If comments are received, they are discussed and resolved by the FG management in coordination with the commenters.
* If the amendment is minor, the chairman declares approval
* If the amendment is substantive, another consultation is started, or decision is postponed till the next meeting of the FG

Organizing interim electronic meetings [E-101 §13.3]

The following procedure is to be applied for organizing interim meetings of the FG and its WGs:

* **Announcement** in the general FG email reflector ([fgai4h@lists.itu.int](mailto:fgai4h@lists.itu.int)) for date/time and objectives **two weeks prior**
* **Documents** uploaded to the appropriate repository

Annex E  
Summary of decisions

This is a summary of the decisions taken at Meeting G (New Delhi, 13-15 November 2019):

[Dec-G-1. TG Drivers are asked to read the IPR call as found in G-001 Annex A and collect any declarations of made in return to the IPR question in their meeting minutes.](#_Toc29294416)

[Dec-G-2. The identified list of deliverables identified at this meeting will be issued as an output document of this meeting, FGAI4H-G-200-R02.](#_Toc29294417)

[Dec-G-3. The initial draft editors assigned to each of the deliverables are tasked to prepare a skeleton the latest by 2 December 2019 and provide to the secretariat for circulation.](#_Toc29294418)

[Dec-G-4. Experts interested in contributing to a particular deliverable identified at this meeting are asked to contact the initial draft editor expressing their interest in joining (see Table 1 in FG-AI4H-G-101), copying the secretariat at tsbfgai4h@itu.int.](#_Toc29294419)

[Dec-G-5. Agreed to collect use cases on the use of blockchain on AI for health applications and systems within WG-DASH. Sathish Kumar (mc.sathish@gov.in, Ministry of Communications, India) and Badar Awlad Thani (bader.awladthani@moh.gov.om, Oman) agreed to drive developing this document.](#_Toc29294420)

[Dec-G-6. It was agreed to create an FG deliverable containing practices of health data sharing within countries under the WG DASH. Ferhat Kherif (CHUV, CH) was asked to coordinate this effort.](#_Toc29294421)

[Dec-G-7. Agreed to create an editing group to derive a requirements document for app for collective data acquisition and data annotation led by Manjeet Chalga (manjeetchalga@gmail.com, ICMR, India) and Pierpaolo Palumbo (pierpaolo.palumbo@unibo.it, University of Bologna, Italy). Delivery deadline: 6 January 2020. Experts interested in joining the activity should contact them directly, with the secretariat in CC (tsbfgai4h@itu.int)](#_Toc29294422)

[Dec-G-8. The revised version of the onboarding document in G-035 is agreed as output document; see G-107. Some postproduction editing will be applied to the document prior to posting on the website.](#_Toc29294423)

[Dec-G-9. The Health requirements (WG-HR) is formally closed.](#_Toc29294424)

[Dec-G-10. Agreed to create a WG on Ethics, with ToR and leadership to be defined after harmonization with the WHO group on Ethics. It will be listed on the main FG-AI4H webpage as "in preparation".](#_Toc29294425)

[Dec-G-11. Agreed to collect all ethics related documents submitted to FG-AI4H to share with the WHO WG on ethics.](#_Toc29294426)

[Dec-G-12. Agreed to list the new WG on Clinical Evaluation as "in preparation" in the FG-AI4H website, until its ToR and leadership are defined.](#_Toc29294427)

[Dec-G-13. It was agreed to remind TG Drivers that an update of their activities is expected at each FG meeting.](#_Toc29294428)

[Dec-G-14. TG-Growth (Child growth monitoring) is renamed TG-MCH (Maternal and child health), with Raghu Dharmaraju (rdharmaraju@gmail.com, Wadhwani AI) as the TG Driver.](#_Toc29294429)

[Dec-G-15. Agreed to create a new topic group on dental diagnostics and digital dentistry (TG-Dental), topic drivers are Falk Schwendicke (falk.schwendicke@charite.de) and Joachim Krois (Joachim.krois@charite.de), Charité Berlin (Germany).](#_Toc29294430)

[Dec-G-16. Agreed to create a new TG-FakeMed (AI-based detection of falsified medicine) with Francke Verzefé (fverzefe@gmail.com), TrueSpec-Africa (DRC), as topic driver.](#_Toc29294431)

[Dec-G-17. Agreed that the proponent of FGAI4H-G-024 would join the TG-Outbreaks contributing to the use case of outbreak detection for Dengue dynamic surveillance and forecasting.](#_Toc29294432)

[Dec-G-18. Agreed to rename TG-Cogni (Neuro-cognitive diseases) as TG-Neuro "Neurological diseases". Neuro-cognitive diseases use case becomes a sub-topic group within TG-Neuro. Marc Lecoultre (Business Investigation, CH) remains as the TG driver.](#_Toc29294433)

[Dec-G-19. Agreed to cover the AI based Parkinson's disease screening and management use case as a sub-topic group within the TG-Neuro (ex TG-Cogni). The sub-topic is led by Khondaker Abdullah Al Mamun (AIMS Lab, United International University, Bangladesh), mamun@cse.uiu.ac.bd](#_Toc29294434)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_