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**Committee on the Peaceful
Uses of Outer Space
Scientific and Technical Subcommittee
Fifty-eighth session
Vienna, 19–30 April 2021
Item 15 of the provisional agenda*
Space and global health**

**Draft recommendations on the policies, experiences and
practices in the use of space science and technology for
global health**

**Working Paper by the Chair of the Working Group on Space and
Global Health**

I. Introduction

**High-level objectives of the working group on space and global
health**

1. The Committee on the Peaceful Uses of Outer Space, at its fifty-ninth session, agreed on seven thematic priorities of the fiftieth anniversary of the United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE+50), and endorsed the following objectives for the Thematic priority 5 of UNISPACE+50, on strengthened space cooperation for global health (see [A/71/20](#), para. 296):

(a) Improving the use of space technologies and space-based information and systems in the global health domain;

(b) Promoting enhanced cooperation and sharing of information in emergencies, epidemics and early warning events, as well as on environmental parameters;

(c) Enhancing capability in integrating health data into disaster management plans;

(d) Strengthening capacity-building in advancing space technologies in global health efforts;

(e) Identifying governance and cooperation mechanisms to support the strengthening of space cooperation for global health.

* [A/AC.105/C.1/L.387](#).



2. The above objectives have been followed by the Expert Group on Space and Global Health of the Scientific and Technical Subcommittee of the Committee, with substantive support provided by the Office for Outer Space Affairs of the Secretariat, in outlining possible ways to strengthen work in promoting the use of space science, technology and applications in the global health domain, as stated in the Note by the Secretariat on UNISPACE+50 thematic priority 5 (Strengthened space cooperation for global health) ([A/AC.105/1172](#)) of 31 October 2017.
3. On the basis of the recommendations contained in the progress report by the Co-Chairs of the Expert Group on Space and Global Health on the fourth meeting of the Expert Group ([A/AC.105/C.1/2018/CRP.17](#)) and in the final report on thematic priority 5 ([A/AC.105/1172](#)), a working group under a new item entitled “Space and global health” on the agenda of the Subcommittee was established in 2018. At its sixty-first session in 2018, the Committee on the Peaceful Uses of Outer Space welcomed the establishment of the Working Group on Space and Global Health, with Antoine Geissbühler (Switzerland) as Chair.

Process for drafting recommendations

4. At its fifty-sixth session, in 2019, the Scientific and Technical Subcommittee endorsed the multi-year workplan of the Working Group on Space and Global Health. According to its multi-year workplan ([A/AC.105/1202](#), Annex III, Appendix I), the Working Group has issued, in 2019 and 2020, a questionnaire to elicit the contributions of Member States and international organizations on experiences and practices in the use of space science and technology for global health, and on practices and initiatives, current or planned (concepts, science, capacity-building and operations) in the use of space (technology, applications, practices and initiatives) in support of global health and for attaining the health-related Sustainable Development Goals of the 2030 Agenda for Sustainable Development.
5. Rich contributions were received, reviewed and synthesized by the Secretariat (see [A/AC.105/C.1/2021/CRP.7](#)), and summarized below (Chapter II). Taking into account these information as well as previous recommendations (Chapter III), an updated set of recommendations is proposed (Chapter IV). These draft recommendations will be discussed during the upcoming meeting of the Working Group on Space and Global Health during the fifty-eighth session of the Scientific and Technical Subcommittee in 2021. Based on these discussions, the Chair of the Working Group will prepare a first draft of the report of the Working Group to the Subcommittee.

II. Questionnaire

6. As proposed in its multi-year workplan ([A/AC.105/1202](#), Annex III, Appendix I), the working group was tasked, inter alia, to “develop a questionnaire to be circulated by the Secretariat for contributions of States members of the Committee, international intergovernmental and non-governmental organizations with permanent observer status with the Committee, United Nations entities, Group on Earth Observation, World Organization for Animal Health, and International Red Cross and Red Crescent, as well as Doctors Without Borders on experiences and practices in the use of space science and technology for global health, and on practices and initiatives, current or planned (concepts, science, capacity-building, operations) in the current uses of space (technology, applications, practices and initiatives) in support of global health and for attaining health-related Sustainable Development Goals of the 2030 Agenda for Sustainable Development”.

7. Issues to be documented are derived from recommendations found in two key documents:

(a) Note by the Secretariat on UNISPACE+50 thematic priority 5 (Strengthened space cooperation for global health) ([A/AC.105/1172](#));

(b) Progress report by the Co-Chairs of the Expert Group on Space and Global Health on the fourth meeting of the Expert Group held from 31 January to 1 February 2018 ([A/AC.105/C.1/2018/CRP.17](#)).

8. These provide additional insight, complementing the scoping review on the applications of space technologies to global health, mandated by the Expert Group at its first meeting held on 5 February 2015 ([A/AC.105/C.1/2015/CRP.29](#), para. 15), further elaborated by the Expert Group at its third meeting held in February 2017 ([A/AC.105/C.1/2017/CRP.28](#), paras. 5, 13 and 18), and published in the *Journal of Medical Internet Research* in 2018.¹

Contents of the questionnaire

9. In February 2019, the Working Group agreed on the following set of questions regarding policies, experiences and practices in the use of space science and technology for global health ([A/AC.105/1202](#), Annex III, Appendix II):

1. Please describe existing or planned formal cooperative agreements and other institutional arrangements (MoUs, letters of agreement, frameworks of collaboration etc.) between health sector and all sectors directly linked to space activities at the national level.^{2,3}
2. Please provide recommendations regarding the establishment of a dedicated platform for effective coordination among United Nations entities, other international organizations and relevant actors, on space and global health issues.⁴
3. Please describe existing or planned policy-enabled environment and governance mechanisms, for removing barriers to the effective use of space-based technologies in support of global health.⁵

¹ Dietrich D, Dekova R, Davy S, Fahrni G, Geissbuhler A. Applications of Space Technologies to Global Health: Scoping Review. *J Med Internet Res.* 2018 Jun 27;20(6):e230. doi: 10.2196/jmir.9458. Review. PubMed PMID: 29950289; PubMed Central PMCID: PMC6041558. Link to the article: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6041558/>.

² [A/AC.105/1172](#), para. 74.a: Encourage formal cooperative agreements between health authorities and space authorities at the national level.

³ [A/AC.105/C.1/2018/CRP.17](#), para. 14.c: In an effort to promote inter-sectorial collaboration at the national level, the working group would take appropriate efforts to document all institutional arrangements (MoUs, letters of agreement, frameworks of collaboration etc.) among the health sector and all sectors directly linked to space activities at the national level. This effort is consistent with the objective of promoting an active engagement of health organizations in expressing their needs (pull model) relating to technologies and knowledge arising from space science and technology. This measurable activity would provide an ongoing indication of progress under this objective.

⁴ [A/AC.105/1172](#), para. 74.b: Establish a dedicated platform for effective coordination among United Nations entities, other international organizations and relevant actors, on space and global health issues.

⁵ [A/AC.105/1172](#), para. 80.b: Member States are encouraged to establish policy-enabled environment and governance mechanisms, with due consideration of legal and ethical issues, for removing barriers to the effective use of space-based technologies, including telemedicine solutions.

4. Please describe existing or planned open data-sharing policies and participatory approaches to developing and improving access to geospatial information relevant to global health.⁶
5. Please describe existing or planned efforts related to the geotagging of all assets relevant to health systems, including health information systems.⁷
6. Please describe existing or planned intersectoral coordination and cooperation for effective international, regional, national and subnational capacity-building activities relevant to the application of space science and technology in the field of global health.⁸
7. Please describe existing or planned mechanisms to engage learning institutions and other capacity-building mechanisms in motivating young health professionals, at an early stage, to acquire space-related skills and abilities.⁹
8. Please describe existing or planned mechanisms to better integrate, harmonize and share space-derived data and information into decision-making processes related to global health.¹⁰
9. Please describe how space technology and applications are integrated in health-related emergency planning and management and disaster management plans.¹¹
10. Please describe key activities, reference documents and plans relevant to “Space for Global Health” activities.¹²
11. Please provide an overview of existing and planned practices and initiatives in the current uses of space (technology, applications, practices and initiatives) in support of global health, and identify gaps, if any, in the following areas:
 - (a) Tele-medicine and tele-health
 - (b) Tele-epidemiology

⁶ A/AC.105/1172, para. 80.c: Member States are strongly encouraged to promote open data-sharing policies and participatory approaches to developing and improving access to all geospatial information relevant to global health, whenever possible.

⁷ A/AC.105/1172, para. 80.d: Member States and participating entities are encouraged to advance their efforts related to the geotagging of all assets relevant to health systems, including health information systems, and make them available to further the attainment of health goals.

⁸ A/AC.105/1172, para. 80.e: Intersectoral coordination and cooperation should be enhanced for effective international, regional, national and subnational capacity-building activities relevant to the application of space science and technology in the field of global health. Actors engaging in such activities should consider follow-up mechanisms aimed at strengthening the sustainability of the activities.

⁹ A/AC.105/1172, para. 80.f: Member States are encouraged to engage learning institutions and other capacity-building mechanisms in motivating young health professionals, at an early stage, to acquire space-related skills and abilities.

¹⁰ A/AC.105/1172, para. 80.g: Member States are encouraged to enable organizational and technical interoperability to facilitate the development and implementation of space-based science and technology in the health sector.

¹¹ A/AC.105/1172, para. 80.h: Member States are encouraged to conduct appropriate drills and exercises to benchmark their operational preparedness and response capacities and capabilities for appropriate use of space technologies in responding to global health events.

¹² A/AC.105/C.1/2018/CRP.17, para. 14.b: Recognizing the broad scope of applications of space technologies and science to global health, the working group would monitor and compile all key activities, reference documents and plans relevant to “Space for Global Health” activities by United Nations entities, including those of the World Health Organization and other international organizations, member States of the Committee as well as, as far as possible, non-governmental organizations and other nongovernmental actors. This annual compilation of activities will serve as a reference to identify and discuss gaps and opportunities and will be shared broadly in an effort to raise awareness and promote cooperation among relevant actors in this domain.

- (c) Space life sciences
- (d) Disaster and health emergency management
- (e) Other areas

Analysis of responses to the questionnaire

10. Responses were received from the following States members of the Committee and internal organizations: Algeria, Argentina, Australia, Bolivia (Plurinational State of), Bulgaria, Canada, Colombia, Egypt, Germany, Hungary, India, Japan, Malaysia, Mexico, Paraguay, Peru, Philippines, the Russian Federation, Saudi Arabia, Switzerland, Thailand, and Turkey, as well as the European Union, the Committee on Space Research (COSPAR), the Economic and Social Commission for Asia and the Pacific (ESCAP), the International Telecommunication Union (ITU), the Space Generation Advisory Council (SGAC), and the United Nations Environment Programme (UNEP).

11. Responses to the set of questions regarding policies, experiences and practices in the use of space science and technology for global health are available in all official languages of the United Nations in the following documents: [A/AC.105/C.1/117](#) and Add.1 and 2; and [A/AC.105/C.1/119](#) and Add.1, 2, and 3. A detailed review of responses received from States members of the Committee and international organizations, compiled by the Secretariat, is contained in the conference room paper XXX. Key findings from the detailed review are summarized below.

Question 1: cross-sectoral linkages

12. Under Question 1, respondents were asked to describe existing or planned formal cooperative agreements and other institutional arrangements (memorandums of understanding (MoU), letters of agreement, frameworks of collaboration, etc.) between the health sector and other sectors directly involved in space activities at the national level.

13. There is widespread cooperation between the health and space sectors, although the level of formalization differs greatly amongst respondents. Cooperation agreements span various domains of activities, including telemedicine and hospital networks connectivity, mapping of health resources and serving communities and remote areas, tele-epidemiology and public health, including in the areas of air quality, climate change and environmental pollution, vector-borne diseases and COVID-19, as well as space life sciences, disasters and health emergency management.

14. The diversity of agreements and the variety of domains makes it difficult to recommend a single mechanism for cross-sectoral linkages. However, there is a lot to learn from the different implementations, and further understanding on the performance of such linkages would likely be useful to share amongst interested stakeholders.

Question 2: coordination platform

15. Under Question 2, respondents were asked to provide recommendations regarding the establishment of a dedicated platform for effective coordination among United Nations entities, other international organizations and relevant actors on space and global health issues.

16. There is significant feedback on the added value of a platform to foster coordination, share best practices, success stories and lessons learned, create conditions for effective, cross-disciplinary work and comparative research, raise awareness and provide access to capacity-building.

17. However, it is not recommended to create a new institution, but instead to use as much as possible the existing resources, including the World Health Organization

(WHO), the Working Group on Space and Global Health, the Asia–Pacific Economic Cooperation forum, the GEO Health Community of Practice, and other international organizations.

18. The platform could be linked to the activities of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER), or could be patterned on the International Telecommunication Union–WHO partnership on e-health.

19. The dedicated platform should be supported by a centralized online tool to share and access data and methodologies; serve as a repository for health and space documents; create health risk, land use and other maps; discuss programs, issues and updates that represent a valuable knowledge base for improving the government response. Such a tool should not be used commercially given its humanitarian role and should enable permanent, unrestricted and timely access by all actors. Proposal was made that such platform could be established in Geneva, which is already home to many centres of expertise and to international organizations and academic institutions.

20. International conferences could be organized based on experiences from the DLR’s “Space2Health” network activities and the Mexican Space Agency’s annual national congress on space medicine in bringing together health and space communities.

Question 3: removing barriers

21. Under Question 3, respondents were asked to describe existing or planned policy-enabled environmental and governance mechanisms for removing barriers to the effective use of space-based technologies in support of global health.

22. Identified barriers include little scientific research on the subject, fragmented communication among actors in the fields of health, space and applied science, the limited use of satellite data as a result of accessibility, utilization capacity and data quality, trustworthiness of information, and limited awareness of the work that is being done in this field at the international and national levels.

23. Various coordination mechanisms are in place or being developed to address these barriers and strengthen governance in the space sector to support and improve national and global health coordination.

24. Non-governmental organizations could also contribute to removing the barriers through information- and knowledge-sharing fora, provision of scholarships, dissemination of knowledge, capacity-building events and provision of mentorships.

Question 4: data sharing and participatory approaches

25. Under Question 4, respondents were asked to describe existing or planned policies on open data-sharing and participatory approaches to developing and improving access to geospatial information relevant to global health.

26. Open data policies are adopted by various national agencies and international organizations. Inter-institutional data sharing is also common and has been accelerated by the COVID-19 pandemic. Efforts are also ongoing to make satellite data produced by governments available to foster new business opportunities, notably in Japan.

Question 5: geotagging of health systems’ assets

27. Under Question 5, respondents were asked to describe existing or planned efforts related to the geotagging of all assets relevant to health systems, including health information systems.

28. There are several national initiatives to geo-tag health assets, including infrastructure and mobile assets. Tools are developed and implement advanced

geospatial modelling tools, geographical information systems, spatial data infrastructure and spatial statistics to support public health and global health initiatives.

Question 6: capacity-building activities

29. Under Question 6, respondents were asked to describe existing or planned intersectoral coordination and cooperation for effective international, regional, national and subnational capacity-building activities relevant to the application of space science and technology in the field of global health.

30. Responses demonstrate examples of intersectoral coordination and cooperation, as well as an overview of capacity-building efforts by governmental agencies and academic institutions.

Question 7: motivating young health professionals

31. Under Question 7, respondents were asked to describe existing or planned mechanisms to engage educational institutions and other capacity-building mechanisms in motivating young health professionals to acquire skills and abilities required to efficiently use advantages provided by space technology, science and applications at an early stage in their careers.

32. Youth-oriented capacity-building mechanisms exist at the school, college- and university-level science programs, space-related research and development opportunities, online courses, collaboration projects, training and seminars, conferences, outreach and awareness raising events.

33. The Space Generation Advisory Council, and its Space Medicine and Life Sciences project group, actively engage with educational institutions to provide an environment for young health professionals to acquire skills required to apply space solutions in improving patient care on Earth.

Question 8: integration and harmonization of space-derived data for decision-making

34. Under Question 8, respondents were asked to describe existing or planned mechanisms to better integrate space-derived data and information into decision-making processes related to global health, and to harmonize and share such data.

35. There are numerous examples of using space-derived information to inform public health and global health decision-making processes regarding infectious diseases and pandemic tracking, neglected diseases, diseases linked with the environment and climate change, food security and access to healthcare, as well as health monitoring.

36. Harmonization initiatives include the ESCAP “One Data–One Map–One Platform” as well as the Group on Earth Observations (GEO) Human Planet Initiative.

Question 9: health-related emergency planning and disaster management plans

37. Under Question 9, respondents were asked to describe how space technology and applications are integrated into health-related emergency planning and management and disaster management plans.

38. Respondents recognized an important role played by space technologies in emergency response by contributing to monitoring and reporting, national-level situational awareness, warning products and integrated risk assessments, as well as national-level planning and response management. The space data and technology are used to provide emergency medical support in remote and hard-to-reach areas, to generate health warnings, analyse risk scenarios, enable the creation of rapid response maps, maps of affected population, epidemiological maps for specific diseases, carry out detailed damage assessment, provide emergency communication, support rescue

efforts, evaluate the situation at the site of the emergency, as well as identify sites that are most appropriate for reconstruction efforts and for resilient health facilities.

Question 10: additional information on activities, documents and plans

39. Under Question 10, respondents were asked to describe key activities, reference documents and plans relevant to the topic “Space for global health”.

40. Multiple local, national and regional activities are reported. Some had previously been described in a 2018 scoping review (Dietrich D, Dekova R, Davy S, Fahrni G, Geissbuhler A. Applications of Space Technologies to Global Health: Scoping Review. *J Med Internet Res.* 2018 Jun 27;20(6):e230).

Question 11: initiatives and gaps in various space and global health domains

41. Under Question 11, respondents were asked to provide an overview of existing and planned practices and initiatives in the current uses of space (technology, applications, practices and initiatives) in support of global health and identify gaps, if any.

42. Gaps in the area of telemedicine and tele-health include the limited uptake of information technology in medical organizations, especially those at the lower levels and those located outside large population centres; the low level of competence of most medical staff in the use of digital technologies and information systems in health care and for medical diagnosis; the lack of harmonized data-sharing standards among the various manufacturers of medical equipment; technical issues such as connectivity and maintenance, especially in peripheral locations, and the need for coordination among all stakeholders.

43. In tele-epidemiology and environmental health, the effective application of Earth remote sensing techniques and data to combat communicable diseases is hampered by limited access to data, and data limitations. Many satellites either do not make it possible to generate high-quality information at the regional level, or are not capable of generating data in thermal infrared spectral bands. In cases when data is available, there is an opposite challenge: how to pick out from the terabytes of data the values of key indicators that can be used for epidemiological analysis and modelling. The lack of a relevant regulatory framework, insufficient financial and human resources, the lack of necessary infrastructure and the need for an international framework for facilitating government institutions’ formal use of such information sources in decision-making make it currently not possible to realize the full potential of benefits offered by space technology.

44. Additional limitations include low awareness among health workers and space experts, a lack of space-related knowledge and skills among health workers, and the absence of cooperation between health and space domains. In the field of space life sciences, there is a need for a platform for advancing research and development for space life sciences through international collaboration. In disaster management and emergency response, there is a need to raise awareness of existing space-based technologies and how they are used in practice, to enhance mechanisms for inter-agency, inter-organizational and interdisciplinary cooperation, to design new – and enhance existing – software and systems that actively use space-based technologies to obtain timely forecasts of health-related events, and to enhance the early warning system for health-related emergencies.

45. In addition to the four main areas, respondents identified the need to pay attention to the necessary structural and technical regulations for the different frequency band models used in satellite communication in order to have a minimal impact on human health; and the importance of planetary biosafety (planetary protection), which aims to prevent the biological contamination both of other celestial bodies and of the Earth.

III. Previous recommendations in the area of space and global health

Recommendations listed in the final report on thematic priority 5: Strengthened space cooperation for global health ([A/AC.105/1172](#))

Para. 73. It is recommended that a new item dedicated to space and global health be put on the agenda of the Scientific and Technical Subcommittee under a multi-year workplan, and that a working group be established that is to be tasked with considering and proposing actions, with the scope of its work to be further determined, relating to the future uses of space (technology, applications, practices and initiatives) in support of global health needs in the wider context of sustainable development on Earth, including the contribution of space science and technology and their applications to the achievement of the Sustainable Development Goals, and taking into account the concerns and interests of all countries, in particular those of developing countries.

Para. 74. It is recommended to further pursue and elaborate the recommendations contained in the final report of the Action Team on Public Health on the use of space technology to improve public health ([A/AC.105/C.1/L.305](#)), with particular attention to governance and cooperation mechanisms, taking the following action:

(a) Encourage formal cooperative agreements between health authorities and space authorities at the national level;

(b) Establish a dedicated platform for effective coordination among United Nations entities, other international organizations and relevant actors, on space and global health issues;

(c) Encourage United Nations entities, intergovernmental organizations and national Governments to pursue effective coordination in all key space activities relevant to global health (telecommunications, GNSS, remote sensing and GIS, and space life science and technology development).

Para. 75. There should be strengthened institutional arrangements between the Office for Outer Space Affairs and WHO for effective collaboration.

Para. 76. WHO should establish a dedicated high-level focal point for space-related affairs to advance the use of space science and technology in global health.

Para. 77. The key role of the Office for Outer Space Affairs in providing technical support to United Nations entities and intergovernmental organizations on interdisciplinary and cross-sectorial space-related matters should be reinforced. Further attention should be given to promoting a “one health, one planet” perspective.

Para. 78. WHO should be actively engaged in some of the activities of the Office for Outer Space Affairs that are relevant to global health, including, but not limited to, UN-SPIDER technical advisory missions. The Office should also be more closely involved in activities of WHO on a reciprocal basis, as appropriate.

Para. 79. The United Nations system should support the wider application of space solutions for global health. This could be achieved by encouraging the implementation of a broader range of space solutions for sustainable development, and could include public-private partnerships.

Para. 80. Building on the foregoing, the following specific cross-cutting recommendations are made:

(a) United Nations entities and intergovernmental organizations should develop appropriate tools to enable Member States to address their public health needs related to space technology;

(b) Member States are encouraged to establish policy-enabled environment and governance mechanisms, with due consideration of legal and ethical issues, for

removing barriers to the effective use of space-based technologies, including telemedicine solutions;

(c) Member States are strongly encouraged to promote open data-sharing policies and participatory approaches to developing and improving access to all geospatial information relevant to global health, whenever possible;

(d) Member States and participating entities are encouraged to advance their efforts related to the geotagging of all assets relevant to health systems, including health information systems, and make them available to further the attainment of health goals;

(e) Intersectoral coordination and cooperation should be enhanced for effective international, regional, national and subnational capacity-building activities relevant to the application of space science and technology in the field of global health. Actors engaging in such activities should consider follow-up mechanisms aimed at strengthening the sustainability of the activities;

(f) Member States are encouraged to engage learning institutions and other capacity-building mechanisms in motivating young health professionals, at an early stage, to acquire space-related skills and abilities;

(g) Member States are encouraged to enable organizational and technical interoperability to facilitate the development and implementation of space-based science and technology in the health sector;

(h) Member States are encouraged to conduct appropriate drills and exercises to benchmark their operational preparedness and response capacities and capabilities for appropriate use of space technologies in responding to global health events.

Recommendations listed in the progress report by the Co-Chairs of the Expert Group on Space and Global Health on the fourth meeting of the Expert Group (A/AC.105/C.1/2018/CRP.17)

Para. 13. The Expert Group reaffirmed the importance of the findings in the document on Thematic priority 5 ([A/AC.105/1172](#)) and recommended as stated that “a new item dedicated to space and global health be put on the agenda of the Scientific and Technical Subcommittee under a multi-year workplan, and that a working group be established that is to be tasked with considering and proposing actions, with the scope of its work to be further determined, relating to the future uses of space (technology, applications, practices and initiatives) in support of global health needs in the wider context of sustainable development on Earth, including the contribution of space science and technology and their applications to the achievement of the Sustainable Development Goals, and taking into account the concerns and interests of all countries, in particular those of developing countries”.

Para. 14. In this context, the Expert Group recommended the following initial scope of activities to be considered by the work group over the next 4 years:

(a) Recognizing the importance of the recommendation on establishing a dedicated platform for effective coordination among United Nations entities, other international organizations and relevant actors on space and global health, the working group would be tasked to support the establishment of such a platform;

(b) Recognizing the broad scope of applications of space technologies and science to global health, the working group would monitor and compile all key activities, reference documents and plans relevant to “Space for Global Health” activities by United Nations entities, including those of the World Health Organization and other international organizations, member States of the Committee as well as, as far as possible, non-governmental organizations and other nongovernmental actors. This annual compilation of activities will serve as a reference to identify and discuss gaps and opportunities and will be shared broadly in

an effort to raise awareness and promote cooperation among relevant actors in this domain;

(c) In an effort to promote inter-sectorial collaboration at the national level, the working group would take appropriate efforts to document all institutional arrangements (MoUs, letters of agreement, frameworks of collaboration etc.) among the health sector and all sectors directly linked to space activities at the national level. This effort is consistent with the objective of promoting an active engagement of health organizations in expressing their needs (pull model) relating to technologies and knowledge arising from space science and technology. This measurable activity would provide an ongoing indication of progress under this objective;

(d) Recognizing a growing number of interested actors from various sectors, the working group would be tasked to develop an engagement strategy to analyse and assess current actors' roles and interests in the domain of Space and Global Health. This engagement strategy is expected to be used to help to promote synergy, complementarity, cooperation and coordination among all actors;

(e) As recognized in the United Nations/WHO/Switzerland Conference on Strengthening Space Cooperation for Global Health, held in Geneva from 23 to 25 August 2017 (A/AC.105/1161), space is directly relevant to human health, animal health, plant health, environmental health and ocean health in an inter-connected framework known as "One Health". The working group would be tasked to promote capacity-building events, to be organized by United Nations entities and other relevant actors, with the objective to further promote awareness and engagement of the important contribution of space science and technology among "One Health" actors. These efforts will aim to broaden the number of organizations and of other actors of the health domain actively engaged in using space science and technology;

(f) Attentive to the broad needs expressed over the years in the field of space and global health and taking into account future evolving needs, the Working Group will be tasked to review its terms of reference and to update its workplan as appropriate.

Para. 15. Recognized the significant strategic potential of Geneva, Switzerland, as an international platform for global health and digital innovation, the Expert Group recommended that the current Expert Group co-chair, Antoine Geissbühler from Geneva University Hospitals, Switzerland, take the lead of the Expert Group in the transitional phase and be elected chair of the subsequent proposed working group when established.

Para. 16. With particular attention to the efforts by WHO in implementing recommendations arising from the document on the Thematic priority 5, the Expert Group recommended for the WHO and the Office for Outer Space Affairs to take appropriate steps in actively pursuing progress relating to these recommendations and to engage in the work of the proposed working group and other relevant activities related to space and global health.

Para. 17. Recognizing the critical importance of maintaining momentum arising from the past year's activities, in particular, stemming from the flagship United Nations /WHO/Switzerland Conference, the Expert Group recommended to continue pursuing its activities and engagement and to support the Subcommittee until the formal establishment of the proposed working group on Space and Global health. It is understood that when and if the working group is formally established, the Expert Group on Space and Global health would then re-orient its efforts in the framework of the new working group.

Para. 18. In this context, in future anticipation of the potential role of Geneva, Switzerland as a strategic locus in the domain of space and global health, the Expert Group nominated the current Expert Group co-chair, Antoine Geissbühler from Switzerland, to fully assume the leadership of the Expert Group from now on and recommended his election as chair of the subsequent proposed working group.

IV. Draft recommendations

Overall assessment

46. The responses to the questionnaire and other previously published documents illustrate the richness and diversity of policies, experiences and practices in the use of space science and technology for global health, some of which have been particularly highlighted during the COVID-19 pandemic.

47. However, these also demonstrate the variability of implementations and the need for further collaboration at various levels, including policy development, capacity-building, implementation and scaling-up of tools and practices.

48. Although rich and potentially informative to various stakeholders, knowledge about policies, experiences and practices remains scattered and cannot easily be shared and reused.

49. More specifically, gaps identified for the use of space science and technology in support of global health include:

- Insufficient international, inter-agency, inter-organizational and interdisciplinary collaboration between health and space domains.
- Insufficient awareness of existing space-based technologies and how they can be used in practice.
- Insufficient competence of health workers in the use of digital technologies and information systems including those enabled by space science and technology.
- A limited uptake of information technology in medical organizations.
- A lack of data-sharing standards.
- A lack of regulatory frameworks for the use of space data for decision-making purposes.
- A limited access to data or obstacles to use the data for decision-making purposes.
- Insufficient tools that actively use space-based technologies for forecasting and managing health-related issues.

Previous recommendations being implemented

50. Several recommendations included in document [A/AC.105/1172](#) (detailed in Chapter III above) have been or are being implemented. These include:

- Creation of the Working Group on Space and Global Health and adoption of its multi-year workplan (para. 73).
- Strengthened collaboration between the Office for Outer Space Affairs and WHO (para. 75).
- Dedicated high-level focal point for space-related affairs at WHO (para. 76).
- Strengthened role of the Office for Outer Space Affairs in providing technical support to United Nations entities (para. 77).
- Common activities between WHO and the Office for Outer Space Affairs, including UN-SPIDER technical advisory missions (para. 78).

51. Several recommendations included in document [A/AC.105/C.1/2018/CRP.17](#) (detailed in Chapter III above) have been or are being implemented. These include:

- Establishment of the Working Group on Space and Global Health (para. 13).

- Inventory and documentation of institutional arrangements among the health sector and all sectors directly linked to space activities at the national level (para. 14.c).
- Development of an engagement strategy to analyse and assess current actors' roles and interests in the domain of Space and Global Health (para. 14.d).
- Switzerland to take the lead of the Expert Group for the transition towards the Working Group on Space and Global Health (para. 15).
- Engagement of WHO and of the Office for Outer Space Affairs in the work of the Working Group on Space and Global Health (para. 16).
- Support of the Expert Group to the creation of the Working Group (para. 17).
- Switzerland to assume the leadership of the Working Group on Space and Global Health (para. 18).

Updated recommendations

52. The following updated set of draft recommendations is proposed for consideration by the Working Group on Space and Global Health at its meetings during the fifty-eighth session of the Scientific and Technical Subcommittee in 2021.

Policy development for strengthened collaboration between the space and global health sectors

Recommendation 1. Encourage United Nations entities, intergovernmental organizations and national Governments to pursue effective coordination in all key space activities relevant to global health (telecommunications, GNSS, remote sensing and GIS, and space life science and technology development).

Recommendation 2. Encourage formal cooperative agreements between health authorities and space authorities at the national level.

Recommendation 3. Encourage Member States to establish policy-enabled environment and governance mechanisms, with due consideration of legal and ethical issues, for removing barriers to the effective use of space-based technologies, including telemedicine solutions.

Policy development for strengthened data accessibility and sharing

Recommendation 4. Encourage Member States to promote open data-sharing policies and participatory approaches to developing and improving access to all geospatial information relevant to global health, whenever possible.

Recommendation 5. Encourage Member States to enable organizational and technical interoperability to facilitate the development and implementation of space-based science and technology in the health sector.

Development and implementation of applications of space solutions for global health

Recommendation 6. United Nations entities and intergovernmental organizations should support the wider development and application of space solutions for global health and public health needs of Member States. This could be achieved by encouraging the implementation of a broader range of space solutions for sustainable development, and could include public-private partnerships.

Recommendation 7. Member States and participating entities are encouraged to advance their efforts related to the geotagging of all assets relevant to health systems, including health information systems, and make them available to further the attainment of health goals.

Recommendation 8. Member States are encouraged to conduct appropriate drills and exercises to benchmark their operational preparedness and response capacities

and capabilities for appropriate use of space technologies in responding to global health events.

Knowledge management and sharing

Recommendation 9. Establish a dedicated platform for effective coordination among United Nations entities, other international organizations and relevant actors, on space and global health issues.

Recommendation 10. Monitor and compile all key activities, reference documents and plans relevant to Space for Global Health activities by United Nations entities, including those of the World Health Organization and other international organizations, member States of the Committee as well as, as far as possible, non-governmental organizations and other nongovernmental actors. This annual compilation of activities will serve as a reference to identify and discuss gaps and opportunities and will be shared broadly in an effort to raise awareness and promote cooperation among relevant actors in this domain.

Recommendation 11. Develop an engagement strategy to analyse and assess current actors' roles and interests in the domain of Space and Global Health. This engagement strategy is expected to be used to help to promote synergy, complementarity, cooperation and coordination among all actors.

Capacity-building activities

Recommendation 12. Enhance intersectoral coordination and cooperation for effective international, regional, national and subnational capacity-building activities relevant to the application of space science and technology in the field of global health. Actors engaging in such activities should consider follow-up mechanisms aimed at strengthening the sustainability of the activities.

Recommendation 13. Encourage Member States to engage learning institutions and other capacity-building mechanisms in motivating young health professionals, at an early stage, to acquire space-related skills and abilities.

Recommendation 14. Promote capacity-building events, to be organized by United Nations entities and other relevant actors, with the objective to further promote awareness and engagement of the important contribution of space science and technology among "One Health" actors. These efforts will aim to broaden the number of organizations and of other actors of the health domain actively engaged in using space science and technology.

Regular review of the workplan

Recommendation 15. Attentive to the broad needs expressed over the years in the field of space and global health and taking into account future evolving needs, the Working Group will be tasked to review its terms of reference and to update it workplan as appropriate.
