Space Generation Advisory Council (SGAC)
In support of the United Nations Programme on Space Applications

About SGAC and Points of Contact

The **Space Generation Advisory Council** (SGAC) in Support of the United Nations Programme on Space Applications is a global non-governmental, non-profit organisation and network which aims to represent university students and young space professionals (18-35 y.o.) to the United Nations, space agencies, industry, and academia. SGAC represents 15,000 members from over 150 countries worldwide, and holds permanent observer status at the UN Committee on the Peaceful Uses of Outer Space (COPUOS). For more information about SGAC, please visit our website: spacegeneration.org or contact info@spacegeneration.org.

The **Space Medicine and Life Sciences** (SMLS) Project Group is SGAC core group of members and experts aiming to provide an international, intercultural and interdisciplinary platform for young professionals with an interest in space biomedical science. SMLS was informally founded in June 2018, ahead of UNISPACE+50, to provide a forum for students and young professionals to discuss the contributions of Space to Global Health and Medicine. The Project Group was formally launched thereafter and members have been invited - and have contributed - to the activities of the UN COPUOS Scientific and Technical Subcommittee (STSC)'s Working Group on Space and Global Health. For more information about the Project group, visit spacegeneration.org/projects/smls or contact smsl@spacegeneration.org.

This document was prepared by the SGAC Space Medicine and Life Sciences Project Group.

SGAC response to the "*Questionnaire on the use of space science and technology for global health*"

1. **Please describe existing or planned formal cooperative agreements and other institutional arrangements (memorandums of understanding, letters of agreement, frameworks of collaboration, etc.) between the health sector and other sectors directly involved in space activities at the national level.**

SGAC SMLS has collaborated with a range of international partners from academia and industry to provide SME mentorship to the next generation solving global health issues by utilising space based solutions.

In 2019, SMLS partnered with the pharmaceutical company **Merck** to host a Space Medical panel and working group discussion during the fourth European Space Generation Workshop conference, held at Imperial College London (spacegeneration.org/esgw2019).

Later in 2019, SMLS partnered with the **Secure World Foundation** and the SGAC Space Technologies for Earth Applications (STEA) project group to coordinate and deliver the **Space4Earth hackathon** in conjunction with the 70th International Astronautical Congress, in Washington DC, in Oct. 2019 (spacegeneration.org/event/sgac-space4earth-hackathon). This hackathon created a forum for SGAC members to innovate and solve UN-SDGs based challenges in interprofessional and multidisciplinary groups.
Over the course of 2019 and 2020, SGAC SMLS has also partnered with **UK Space Life and Biomedical Sciences** (UK Space LABS: www.ukspacelabs.co.uk/) to deliver online educational workshops on space life sciences and global health. We are also delivering an online 6 month Space for Health Systematic Review Workshop in collaboration with UK Space LABS and **University of Northumbria Aerospace Medicine Systematic Review Group** (aerospacemed.rehab/systematic-review-group), with observers and expert supervisors from **ESA Education, NASA AMES, NASA ExMc.** SGAC SMLS also ran an online workshop at the SpaceGen Summit. The Summit included sponsors and partners as **NASA, Blue Origin, Virgin Galactic** and **Lockheed Martin** (spacegeneration.org/sgs2020/sponsors-and-partners).

Going forward, we are in the process of forming partnerships with the **Royal Aeronautical Society (RAeS) Next Generation Group** (nextgenasm.wordpress.com/) and **InnovaSpace** (www.innovaspace.org/) to deliver STEM outreach initiatives to encourage the students globally to engage in STEM education.

Space Generation Advisory Council
c/o European Space Policy Institute (ESPI)
Schwarzenbergplatz 6, Vienna, 1030
AUSTRIA

phone: +43 1 718 11 18 30
email: info@spacegeneration.org
web: www.spacegeneration.org

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.**

SGAC SMLS would like to put forward the following: 1) SGAC SMLS recommends this survey to be used to **map the key stakeholders** in space and health, and to encourage sustainable long-term investment in space for global health through an **e-workshop.** SGAC SMLS further recommends to use the e-workshop conclusions 2) to derive a **roadmap** with key thematic priorities and 3) to create a **collaborative online toolkit** to signpost global health actors to space based solutions. These three recommendations are outlined in more detail below.

1) Stakeholder mapping and e-workshop

To achieve this, SGAC SMLS recommends a cross-sector stakeholder mapping exercise of relevant actors from the results of this survey. These stakeholders could then be invited to an hybrid or online **workshop as a side activity of the COPOUS STSC**, under the coordination of the Working Group on Space and Global Health; with key players from international agencies, industry, academia and UN entities. The aim of this workshop will be to identify key priorities in global health that can be addressed by space applications.

2) Roadmap for Space for Global health priorities

This workshop can be used to derive a Space for Global Health five-year-long roadmap to outline key priorities for the space sector and to achieve the UN Sustainable Development Goals, driving the global health agenda forward impactfully. Each year of the roadmap could have a thematic focus in order to highlight key global health priorities to the space community.

3) Collaborative online toolkit and workshops

SGAC SMLS also recommends a dedicated platform that would help facilitate communication between UN entities, international organisations and relevant actors on space and global health issues. This platform could include a collaborative online toolkit - signposting engaged stakeholders in the space and health sectors to openly share data and best practices for the benefit of public health. An example of a collaborative dashboard is RACE (race.esa.int/) and this is a valuable asset for public health agencies collating EO data across operators and agencies to help with the **SARS-CoV-2** pandemic. Moreover, engagement with the platform will benefit from educational workshops for the stakeholders and the next generation of researchers facilitated by SGAC SMLS.

All in all, these cooperative ventures would enable shared science, shared data and spin-offs for Space & Earth for the benefit of the next generation.

3. Please 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.

SGAC aims "to employ the creativity and vigour of youth in advancing humanity through the peaceful uses of outer space". This objective aligns with the 'The Space Millennium: Vienna Declaration on Space and Human Development' which aims "to create, within the framework of the Committee on the Peaceful Uses of Outer Space, a consultative mechanism to facilitate the continued participation of young people from all over the world, especially women and citizens of developing countries, in cooperative space-related activities".

A key objective of the organisation is to steward the views and opinions of students and young professionals by representing their views to international, regional and national forums. This includes being a permanent observer to COPUOS, and taking active participation in the Space and Global Health Working Group within the COPUOS STSC. Our work is also directed by the overarching themes set out by the UN 2030 Agenda for Sustainable Development.

The views and representations expressed at these forums are informed by multiple mechanisms that directly engage with students and young professionals throughout the world. These policy-driven mechanisms remove barriers to the use of space-based technologies and applications in global health, primarily by creating opportunities for information sharing and education, connecting needs with resources, and disseminating relevant knowledge and methodologies throughout the world, particularly in developing countries. Our mechanisms to help early investigators include open-access **events**, **scholarships,** and **opportunities for professional development.** These are outlined in greater detail below.

Events

- SGAC and SMLS events create a forum for information and knowledge sharing that crosses the international, interdisciplinary, and intergenerational divide, by attracting attendees throughout the world from a broad range of professional backgrounds, and providing access to key leaders and thinkers in the space sector.
- These forums also help generate policy white papers through our working group discussion to international, regional and national governing organisations that support capacity-building and information-sharing activities for students and young professionals to be involved in the use of space technologies for global health.

Scholarships

- Reduce or eliminate financial barriers to participation for students and young professionals from any background or nationality to attend SGAC's events or our partner's events.
- Create opportunities for engagement through global competitions on relevant topics.

Professional Development

- Disseminate knowledge and state-of-the-art through webinars.
- Capacity build skills and abilities through professional development workshops.
- Publicise career building opportunities through our Job Board.
- Provide mentor-mentee relationships to members.

4. Please describe existing or planned policies on open data-sharing and participatory approaches to developing and improving access to geospatial information relevant to global health.

Not applicable to our group.

5. Please describe existing or planned efforts related to the geotagging of all assets relevant to health systems, including health information systems.

Not applicable to our group.

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.

SGAC through its Space Medicine and Life Sciences (SMLS) Project Group has created a **virtual platform,** hosted on the business communication tool Slack, **focused on international and interdisciplinary cooperation for young professionals and students** interested in the application of space science and technology in the field of global health. SGAC (@SGAC: twitter.com/SGAC) and SMLS (@SGAC_SMLS: twitter.com/sgac_smls) also engage early investigators through social media platforms like Twitter. We have a combined following of approximately 14,000 members.

The platform, founded in January 2019, has grown to 321 members as of the end of October 2020. This virtual technology hub aims to build critical mass through a community of practice and capacity-building activities to encourage students and young professionals from anywhere in the world to be involved in the field of space and global health. It is innovative in breaking down barriers to participation for individuals who may not have access to the resources or technical expertise in their local area or country.

Apart from the intangible value created from significant capacity-building and networking through this platform, the Slack platform has also been responsible for spinning off a number of key projects and programs. This is exemplified by SGAC SMLS members participating in the NASA Space Apps Challenge on the use of Space for solutions to tackle the COVID-19 Pandemic (covid19.spaceappschallenge.org/). Similarly, SGAC SMLS members supported a team (shortlisted among the finalists) for the Mars Society City Design Competition. The role of the SMLS team was to envision the medical infrastructure for a future Mars Settlement based

on current and horizon technologies utilised to care for patients in remote Earth environments. (www.marssociety.org/news/2020/09/28/finalists-chosen-in-mars-city-state-design-competition).

7. **Please 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.**

As outlined in previous responses, SGAC and SGAC SMLS both engage with educational institutions to provide an environment for young health professionals to acquire skills required to apply space solutions to improving patient care on Earth. As part of this objective, SGAC SMLS has recently launched the Space for Health Systematic Review Workshop (spacegeneration.org/projects/smls/ongoing-projects). This six-month-long project, outlined in more detail below, will equip early investigators with the skills to critically appraise and review space technology, science and applications.

Space for Health Systematic Review Workshop

Project focus

The Systematic Review Workshop aims to enable students and young professionals to identify gaps in human research priorities and potential solutions with spin-offs to global health. This is in collaboration with the Aerospace Medicine Systematic Review group and the UK Space Life and Biomedical Sciences Association affiliated with the UK Space Agency. This educational initiative will also ensure the next generation of researchers are aware of the challenges we need to solve in the space and global health sector.

Experts from space and health

A call for projects was launched earlier this year. Experts applied from a range of organisations, including ESA Education, NASA AMES, Blue Abyss, UK LABS, and universities such as KCL. Nine projects were shortlisted after peer-review, led by 14 experts representing the space and health sectors.

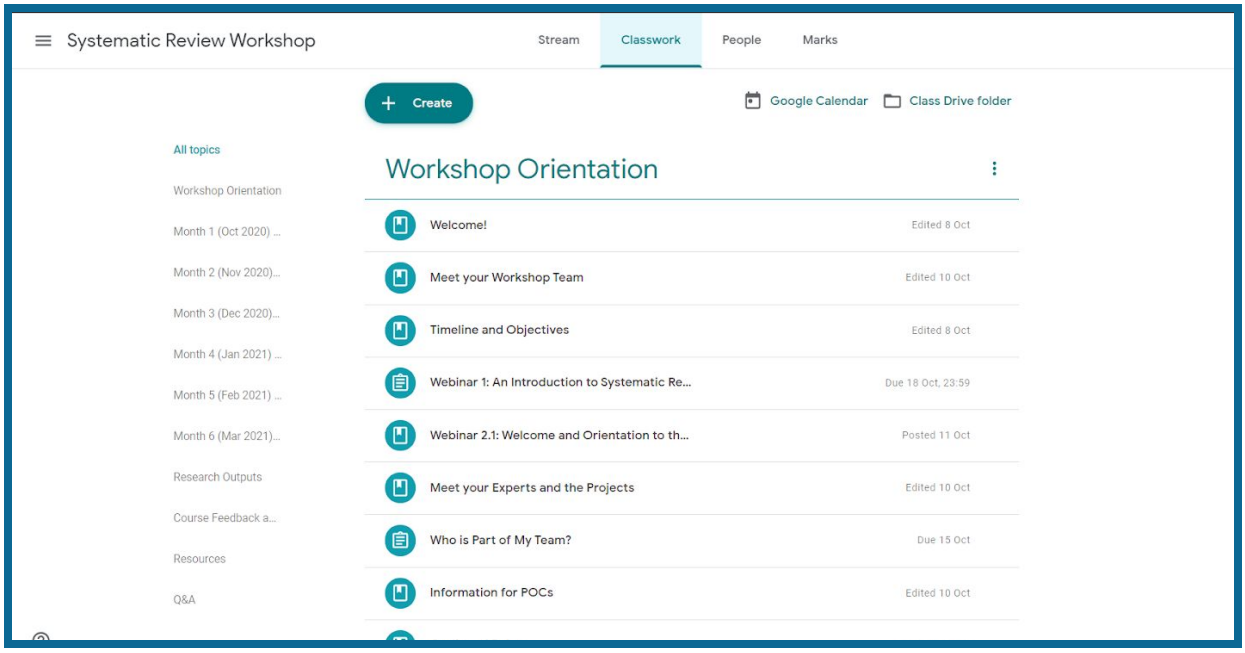
Multi-disciplinary teams

54 multi-disciplinary early investigators (health care professionals, bioethicists, geneticists etc) from a pool of 150+ applicants were selected for the workshop after a free and open access webinar.

The Workshop as an Educational platform

The webinars are available on the SGAC YouTube channel alongside other videos from our 2019/20 ‘Health in Space’ webinar series. In addition, all workshop resources have been collated on Google Classroom with access to their own shared Google Drive space; a joint interface for a shared learning experience available to all 74 participants, experts and co-ordinators from SGAC

SMLS & UK Space LABS. All participants and experts are volunteers. Please see the screenshot below, showcasing how the platform aims to emulate MOOC platforms like FutureLearn.



8. **Please 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.**

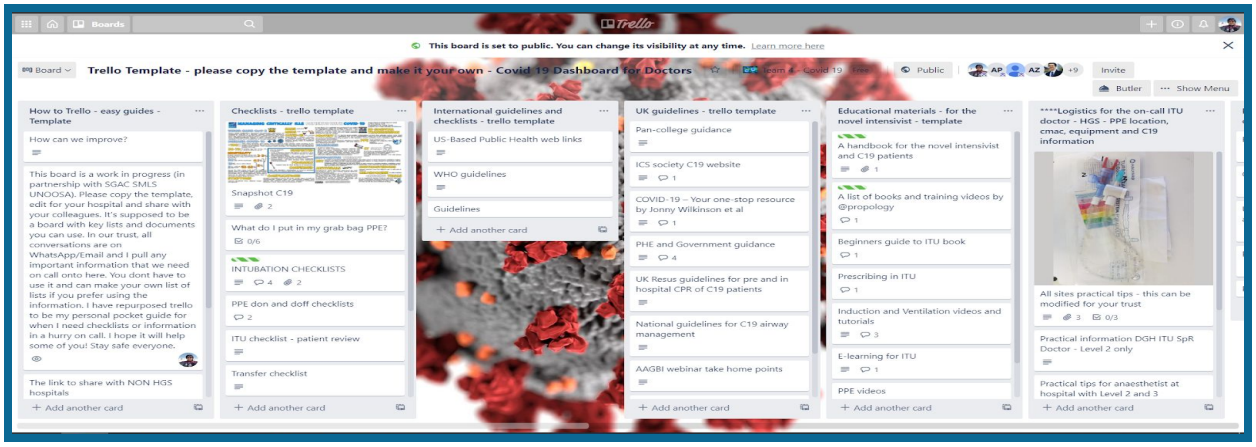
SGAC SMLS and UK Space LABS co-ordinated an Essay competition focused on 'Space applications for Covid-19' and the shortlisted winners were encouraged to submit a summary of their space derived solution as a YouTube video. The finalists were invited to present at a 'Space Technology and solutions for Covid-19' session at the SpaceGen Summit (spacegeneration.org/sgs2020/spacegen-summit-schedule). The feasibility and challenges were discussed in breakout sessions, and then presented at the SGAC Summit by a team representative. In particular, the early investigators attending the session discussed the feasibility of using mobile technology and gamification to engage the younger generation to adhere to preventative public health measures and monitor symptoms of Covid-19. This team and the essay winners will be encouraged to take their projects further by the SGAC SMLS project team through online project management tools like Slack and Trello.

9. **Please describe how space technology and applications are integrated into health-related emergency planning and management and disaster management plans.**

SGAC SMLS have developed a Covid-19 Trello Board Template curating key resources for medical students and hospital doctors. This is editable and can be tailored to local departments all over the world. From feedback, we know that this template has been used by

multiple doctors at the front line from all over the world, for education, checklists and key resources. Please see the link and screenshot below:

trello.com/invite/b/acmPNw1V/5cacb70b83280a66eb246ba97e699e9d/trello-template-please-copy-the-template-and-make-it-your-own-covid-19-dashboard-for-doctors



10. Please describe key activities, reference documents and plans relevant to the topic "Space for global health".

As outlined above, SGAC SMLS has built a community of early investigators (health care professionals, life scientists, public health doctors, EO experts etc) below 35 y.o., and experts from all sectors. The plan is to continue to build an international group of early investigators interested in Space for Global health and circulate our monthly newsletter with a range of opportunities that encompass events, projects and educational initiatives.

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) Telemedicine and tele-health; b) Tele-epidemiology and environmental health; c) Space life sciences; d) Disaster and health emergency management; e) Other

Please see our responses above. As a group we encourage free and open access projects in all these areas to enable early investigators to learn more about the space for the global health field. As we move forward, we will promote next generation participation in events and initiatives to propose viable solutions for these challenges as well as education.