



FOR GLOBAL HEALTH

Dr Anthony Yuen MD BE(Hons)

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Space Medicine and Life Sciences



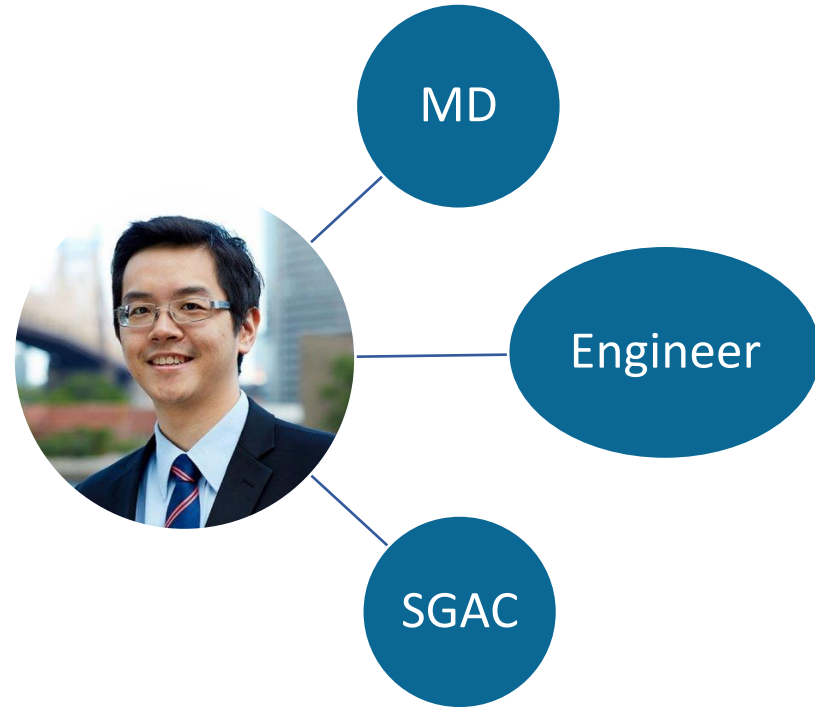
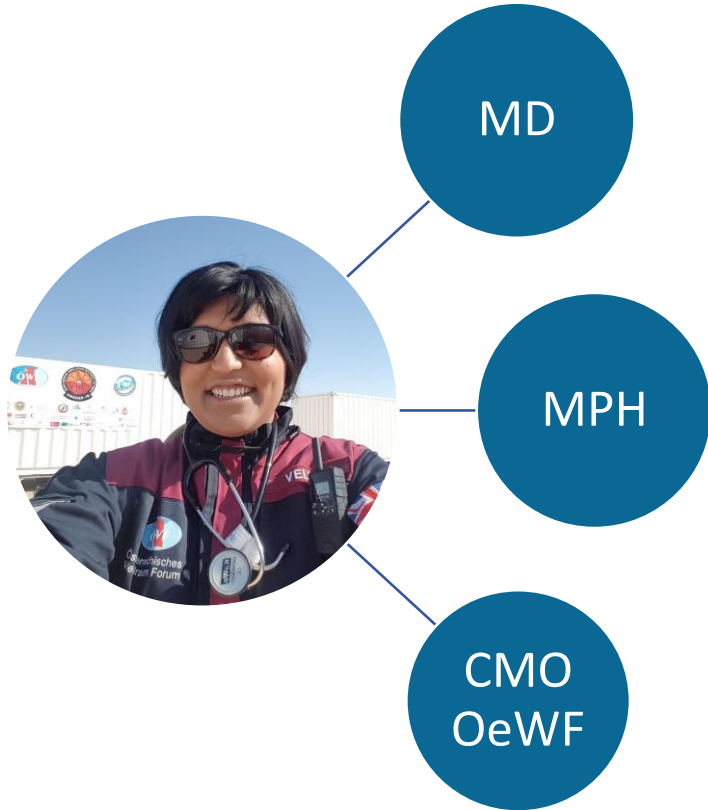


Space Medicine and Life Sciences

Co-Leads

Dr Rochelle Velho

Dr Anthony Yuen



SPACE GENERATION ADVISORY COUNCIL



2018

YEAR IN REVIEW

15,000 members

150+ countries
in 6 regions

8+1 project groups
+ Space Medicine and Life
Sciences Project Group

148
scholarships
& awards

37 congresses,
workshops,
& events
in 27 countries

24 formalised
partnerships

30 papers,
publications,
presentations

Recipient of:



IAF
Excellence in
3G Diversity
Award

Pioneer
Award

implemented



partnering with
UNOOSA

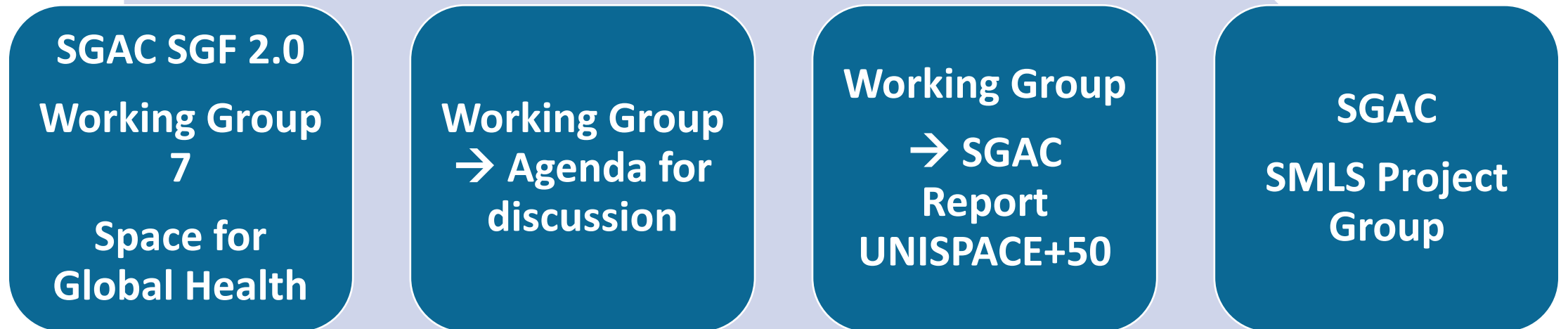
to support the UN

Youth 2030
Agenda

The Space Generation Advisory Council is a global non-governmental, non-profit organisation and network which aims to represent university students and young space professionals to the United Nations, space agencies, industry, and academia.



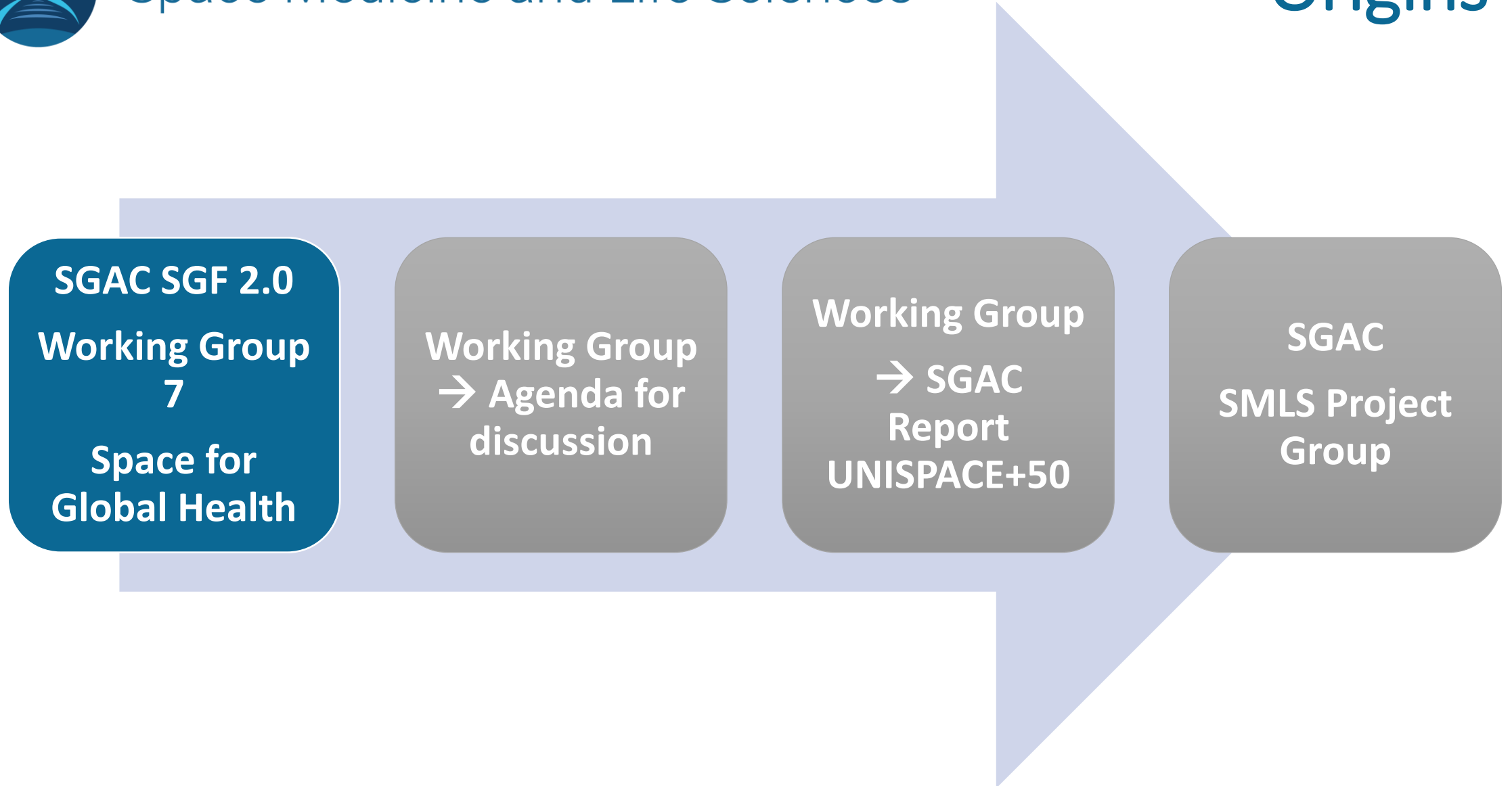
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Origins





Space Generation Forum 2.0

in support of UNISPACE+50

June 16-17th, 2018

What SGF 2.0 Workshop
Where Vienna, Austria
For SGAC Members

for more information, visit www.spacegeneration.org/event/sgf2.html

Hosted By:



SPACE GENERATION
ADVISORY COUNCIL

in support of:



UNITED NATIONS
Office for Outer Space Affairs





SPACE FOR WOMEN



**SPACE AND THE SUSTAINABLE
DEVELOPMENT GOALS**



SPACE FOR SOCIETY



**CAPACITY BUILDING IN THE
SPACE SECTOR**



**BUILDING PARTNERSHIPS IN
SPACE WITH INDUSTRY AND
THE PRIVATE SECTOR**



**SPACE WEATHER AND SPACE
SAFETY**



SPACE FOR GLOBAL HEALTH



WORKING GROUP 7: SPACE FOR GLOBAL HEALTH

10 members
7 nationalities
MDT

Space law, medicine, policy, engineering, public health, WHO, UN, ESA, Concordia, OeWF

Rochelle Velho
Melanie Platz
Adrianos Golemis
Luiz Ferreira
Christoph Beischl
Tania Robles
Carlos Mariscal
Camilo Reyes
Antony Yuen
Lazlo Bacardi





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Agenda

SGAC SGF 2.0
Working Group
7
Space for
Global Health

**Working Group
→ Agenda for
discussion**

Working Group
→ SGAC
Report
UNISPACE+50

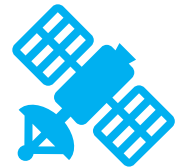
SGAC
SMLS Project
Group

How can space applications be implemented to optimise global health? → UNOOSA



Recognise:

- What are the desirable components of a global health alert system?



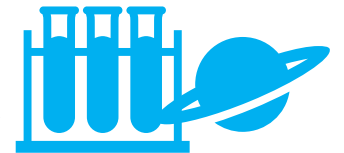
Report:

- How do we overcome the 'last mile problem' to enhance individual and population health?



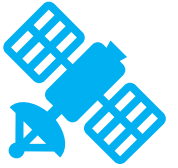
Respond:

- How can space medical spin-offs be efficiently translated to optimise global healthcare?

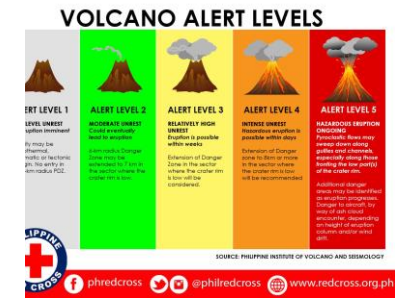
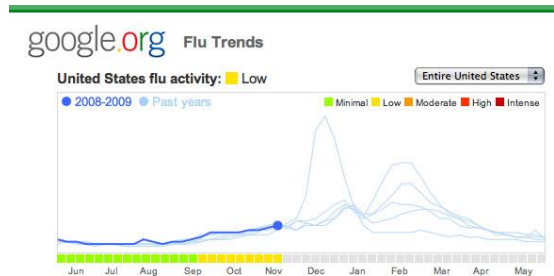


Recognise:

- What are the desirable components of a **global health alert system?**

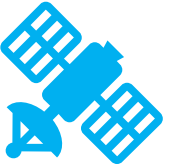


- *Global health alert system* – captures information from different sources to predict the risk and trigger a response to protect individual and population health



Recognise:

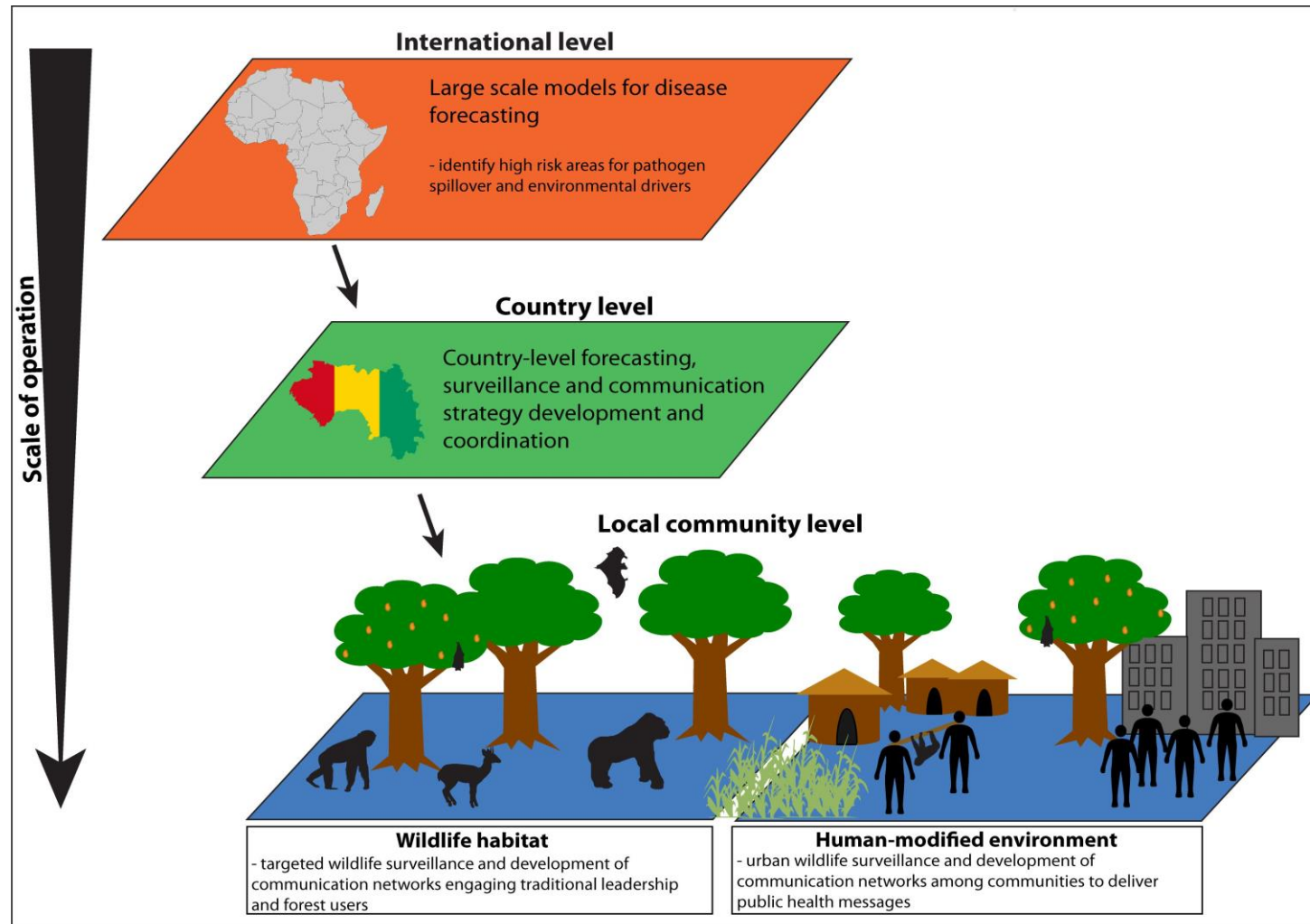
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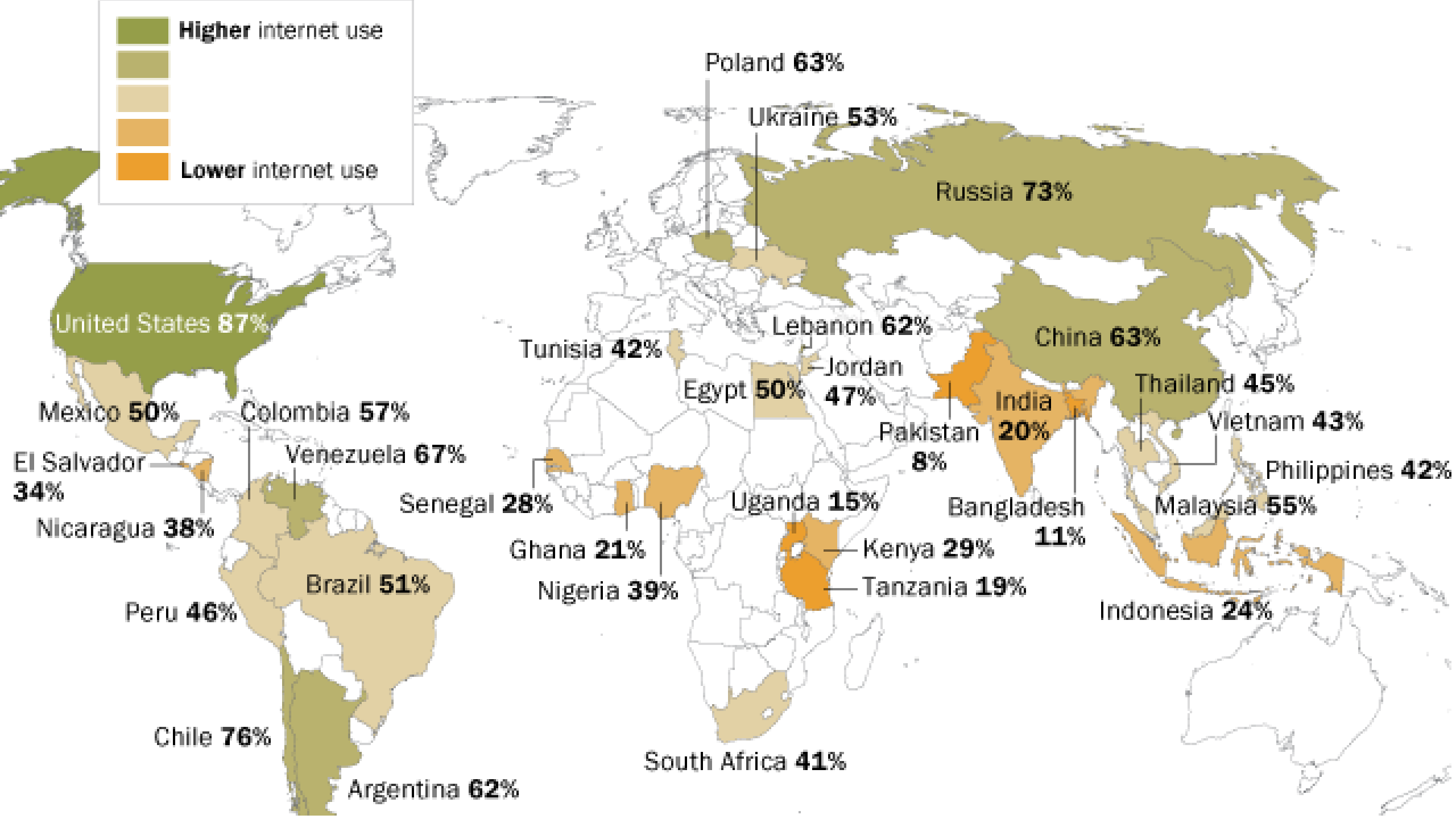


- The Working Group identified a need for a much **closer coordination among all the stakeholders in space and global health.**
- It is recommended to develop a **global virtual platform pooling and granting access to existing space-derived data** pertinent to tackling global health issues.
- To **facilitate individual access to such data**, it is also recommended to work towards recognizing digital interconnectivity as a human right.

Report:

- How do we overcome the 'last mile problem' to enhance individual and population health?





Report:

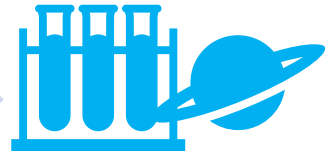
- How do we overcome the 'last mile problem' to enhance individual and population health?



- The current trend indicates the realization of **space-based connectivity to every individual** within the near future.
- It is recommended that the UN builds on this capacity to accomplish the **efficient use of this platform.**
- Furthermore, the solution to the last mile problem, within the context of global health, needs to **facilitate global interconnectivity** and **accessibility to bio-surveillance data via social media** using space technology.

Respond:

- How can space medical spin-offs be efficiently translated to provide solutions to optimise global healthcare?



SPACE AFFECT THE HUMAN BODY?

Space has tremendous effects on the human body! As we prepare for journeys to more distant destinations like Mars, humankind must tackle these risks to ensure safe travel for our modern explorers.

The impacts of microgravity mirror aging and the complications of a sedentary lifestyle. By studying astronauts' health, we also help people on Earth.

BRAIN
Astronauts' sense of perception and orientation can become confused. They sometimes misinterpret the direction and speed of their movements. Some even experience "space sickness."

HEART & BLOOD VESSELS
Blood vessels stiffen and age faster, and astronauts can develop insulin resistance, which may lead to **Type 2 diabetes**. These factors increase the risk of cardiovascular disease.

MUSCLES & NERVOUS SYSTEM
Muscles lose mass and strength. Reflexes slow down and exercise tends to be less effective in space.

BONES
When they don't bear weight, bones lose density and strength. While adults past age 50 typically lose about 1% each year, astronauts in space can

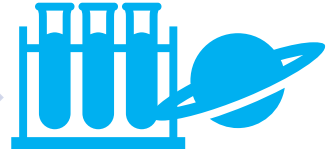
BLOOD
Blood cell production in the bone marrow is affected. Reduced red blood cells can cause **anemia**. Low white blood cell count leaves the body vulnerable to infection and is also linked with increased sensitivity to radiation.

RADIATION
Radiation doses are much higher. Overexposure can cause **cataracts** in the eyes, **damage DNA**, and increase the



Respond:

- How can space medical spin-offs be efficiently translated to optimise global healthcare?

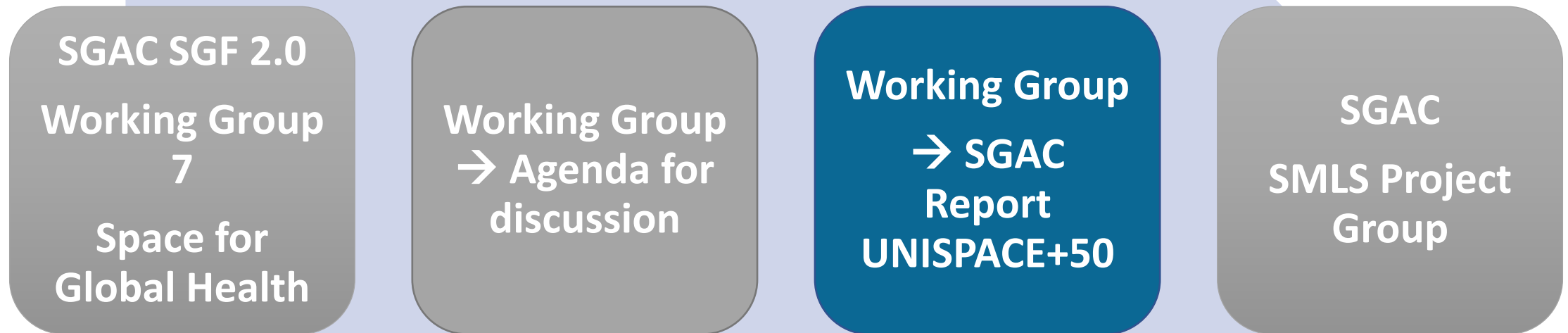


- In terms of dealing with global health, it is recommended that the UN collaborates with the WHO to **meet SDGs for human health through space medicine research outputs.**
- **Prioritize space research initiatives that can be explicitly translated to terrestrial health benefits.**
- Encourage nations to include **spin-off potential of space research as a criterion in funding schemes.**



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Agenda



Recommendations UNISPACE+50

→ CRP

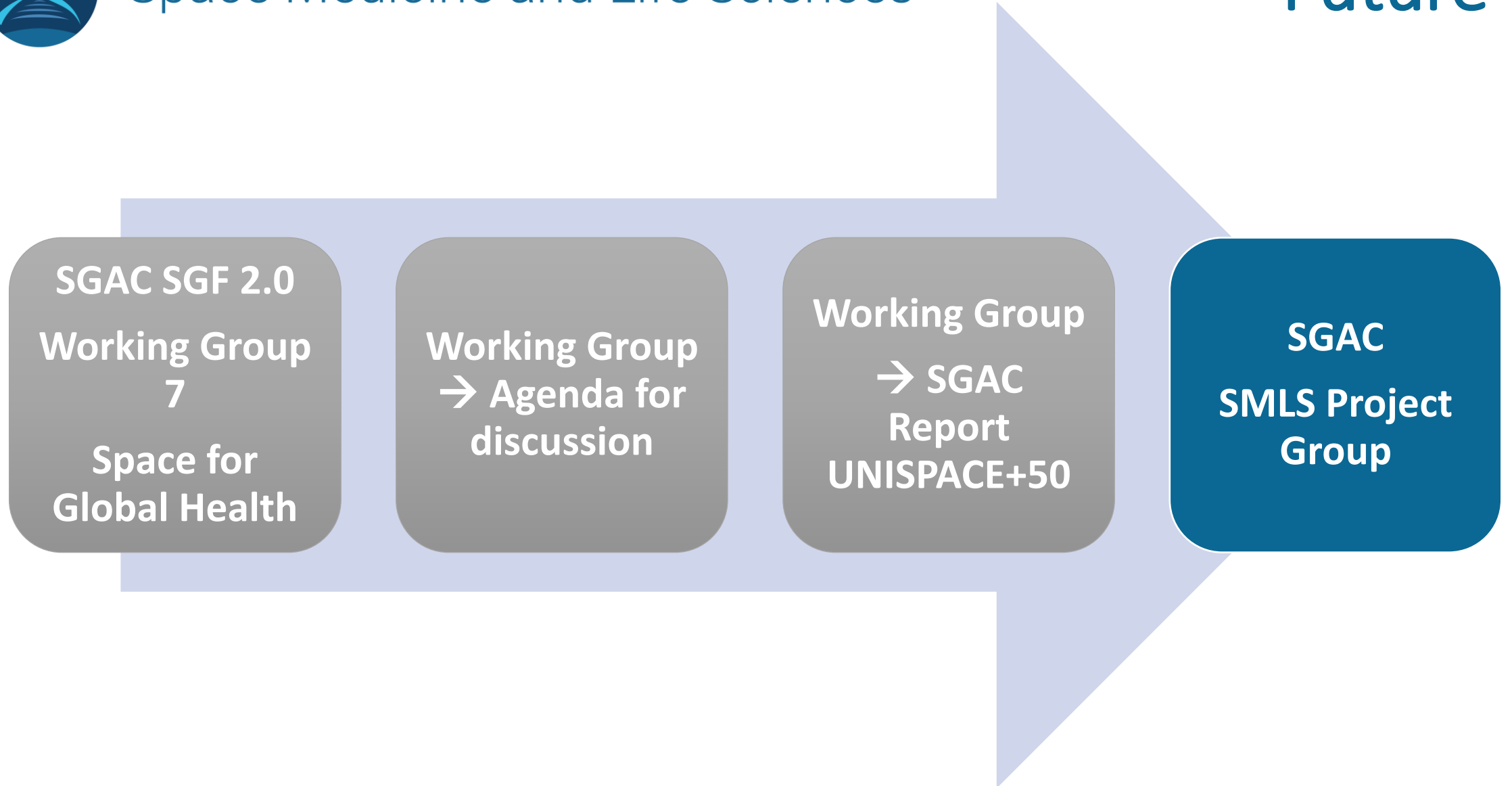
- In recognition of the outcomes of SGF in 1999, the Working Group concluded that the establishment of an International Institute for Space Medicine has an excellent potential to utilize space for advancement of human health
- The young generation might contribute to this effort within the working agenda of Space Generation Advisory Council.
- On the occasion of UNISPACE+50, SGAC will consider establishing a **permanent project group** on this topic.





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Future



SGAC SMLS → Objectives

- Global interdisciplinary platform of SMLS young professionals
- **Collaborate with international stakeholders**
- Focus on space applications for global health, to meet the SDGs
- Standardised evidence-based space medical guidelines

[Please see our website:](https://spacegeneration.org/projects/smls)

<https://spacegeneration.org/projects/smls>

SGAC SMLS → collaboration with this WG

- **Join the conversation as young professionals:**
 - Learn more about the working group objectives
 - Questionnaire review and dissemination
 - Integrate the 5 year goals of this group into our objectives
 - Facilitate outreach and workshops to young professionals



Space Medicine and Life Sciences

We aim to provide an international, intercultural, and interdisciplinary platform for young professionals with an interest in space application for sustainable global development.

<https://spacegeneration.org/projects/smls>

Thank you for listening. Any questions?



**Weill Cornell
Medicine**

Key references

- SGAC SGF 2.0 report: <https://spacegeneration.org/sgf2/final-report>
- UNOOSA
- WHO: http://www.who.int/environmental_health_emergencies/en/
- ESA:
[http://www.esa.int/Our Activities/Preparing for the Future/Space for Earth/Space for health](http://www.esa.int/Our_Activities/Preparing_for_the_Future/Space_for_Earth/Space_for_health)
- Dietrich, Damien et al. “Applications of Space Technologies to Global Health: Scoping Review” *Journal of medical Internet research* vol. 20,6 e230. 27 Jun. 2018, doi:10.2196/jmir.9458