Questionnaire on the use of space science and technology for global health

Questions	Australia's Response
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.	• The Australian Antarctic Division (AAD) (an Australian Commonwealth Government agency) signed a Memorandum of Understanding (MOU) with NASA in 1993, which is still in effect. This MOU specifies the terms for cooperation in the Antarctic between certain programs within the NASA Life Sciences Division and the Polar Medicine Branch of the AAD.
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.	• University stakeholders identified an online forum as a useful platform for communication, allowing for programs/issues/updates in the field to be posted and discussed as they arise. They also noted that this may be limited by institutions having restricted internet access.

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.	• The Australian Academy of Science established a National Committee for Space and Radio Science (NCSRS) who will deliver the 'Australia in Space: a strategic plan for space science'. The Australian Space Agency is a key sponsor of the strategic plan as it aligns with the Agency's purpose as well as its leapfrog R&D priority area. The strategic plan aims to both grow and transform the use of space in the broader areas of the economy, such as the health and medicine sector.
	• A Space Health and Life Sciences Working Group (SHLSWG) sits under the NCSRS. The SHLSWG is focused on space life sciences rather than the health outcomes/clinical practice involvement with the space sector. SHLSWG will deliver an initial report to the NCSRS about how to best position Australia in the international space life sciences landscape of the coming decade by engaging in the following:
	   o Identifying opportunities and priority areas for action and leadership in space medicine;
	   o Delivering a report to the NCSRS which:
	      ▪ Provides a stock take of current and future capabilities and resources in the area;
	      ▪ Identifies national and/or international opportunities, requirements and potential innovations in the next decade; and
	      ▪ Suggests strategies and resourcing necessary to maximise new opportunities.

	o Discussing next steps and implementation plans to progress Australia's space medicine sector in a national context.
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.	• In 2019-20, the Australian Government Department of Health supported the Bureau of Meteorology (BoM) and Department of Agriculture, Water and Environment to deliver the Reducing Life Lost from Heatwaves project. The project bought health, social and environmental data together including datasets from Digital Earth Australia. The results provide a National picture of heat health risk across Australia which includes spatial analysis across the capital cities in each state and territory. • The Australian Government Department of Health has previously undertaken analysis of disease outbreaks, including global geospatial representations of Australia's exposure risk for polio. • The Australian Institute of Health and Welfare (AIHW) regularly publishes reports and web products from its health and welfare data collections at various geographical levels. The Institute also undertakes spatial analysis of health and welfare data that are often published on the AIHW website. • The AIHW is committed to providing statistical information that governments and the community can use to promote discussion and inform decisions on health, housing and community services. They hold valuable data from a wide range of health and welfare collections at a range of geographies, such as Public Health Areas, Statistical Areas (SA2 & 3) and smaller areas. Strict privacy and confidentiality controls are applied to small area data. Results are sometimes unable to be reported for all areas in Australia in cases where reporting small numbers could risk disclosing private or confidential information. At this stage, the AIHW do not have a policy specific to providing open access to their geospatial data holdings. The following link lists the data collections published according to geography https://www.aihw.gov.au/about-our-data/aihw-data-by-geography. • AIHW plans to make small level geospatial data available to key stakeholders via secure access for two projects. • On 26 February 2016, the Australian government released PSMA Australia's Geo-coded National Address File (G-NAF), and their Administrative Boundaries datasets. PSMA is an unlisted public company owned by the nine governments of Australia, including the Commonwealth and State and Territory Governments. PSMA receives location data from each of the jurisdictions and standardises, formats and aggregates the data into authoritative location based national datasets, which can be used for personal navigation applications, infrastructure planning, business planning and analysis, logistics and service planning, and government service delivery and policy development. The first release of the G-NAF and Administrative Boundaries datasets was made available for use and reuse at no cost to end users through the Australian Government's online data portal (www.data.gov.au) on 26 February 2016. Updated versions of the data are published quarterly.

	• The Australian Government is investing $36.9 million for Digital Earth Australia, the digital infrastructure that uses satellite data to detect physical changes across Australia's territories in unprecedented detail. This will be accessible by government, industry and individuals allowing for a wide range of applications, such as the monitoring of environmental and health changes. An example is using the satellite imagery to monitor disease outbreaks and improve disaster risk reduction strategies. • The Australian Government Department of Health has created a COVID-19 Resources Hub which includes authoritative information on Commonwealth respiratory clinics and national COVID-19 assessment centres. The Hub also includes the locations of Australian Aged Care Services, Australian Public and Private Hospitals, pathologies, respiratory medicine specialists and GPs. The Hub improves access to geospatial assets by enabling COVID-19 response activities at a national level and amplifying critical data – such as the location of testing sites – at the local level.
5. Please describe existing or planned efforts related to the geotagging of all assets relevant to health systems, including health information systems.	• The National Health Services Directory contains geographical information for GP practices, allied health, specialist and other health facilities and services. • The AIHW is currently exploring software and application options for geocoding relevant health and welfare data collections.
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.	• See the Question 3 response regarding the Space Health and Life Sciences Working Group.

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.	• A strategic pillar under the Australian Space Agency's Advancing Space: Australian Civil Space Strategy 2019-2028 is 'Inspire', which aims to showcase Australia's achievements in space activities to inspire young people to take up Science, Technology, Engineering and Mathematics (STEM) careers and support growth in the future workforce. The pillar also aims to identify opportunities to increase capability in the space sector. While this strategy is not explicitly linked to the health sector, it provides a foundation to increase capacity-building as the space health industry grows in Australia. • A university stakeholder stated that they were aware of high school level programs to engage students' interest in space and acquire a range of skills to develop and use space technology. An example of this program is at Hamilton College in Adelaide[1]. • The Space Expo and other community based programs held in Adelaide facilitate community awareness and encourage students to engage with the space program early in their schooling. However, these programs are focused on STEM rather than medicine and life sciences.

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.	• The AIHW has a Geospatial Strategy in place to build capability in GIS data, analysis and reporting through web products.
	• The Australian Government is investing more than $260 million in better global positioning systems and new ways for industry to access and use satellite imagery and PNT data that can support medical and health related applications. The investment includes:
	   ○ $160.0 million to deliver a Satellite-Based Augmentation System (SBAS) to provide positioning capability to an accuracy of 10cm across all of Australia, with applications in agriculture, mining and other industries;
	   ○ $64 million to establish a National Positioning Infrastructure Capability (NPIC) that will drive productivity and innovation in a number of industries, including transport, agriculture, mining and construction by providing more accurate global positioning (GPS) data; and
	   ○ $36.9 million for Digital Earth Australia (discussed in Question 3).

9. Please describe how space technology and applications are integrated into health-related emergency planning and management and disaster management plans.	• Bureau of Meteorology briefings are routinely incorporated into summer preparedness activities. Their briefings provide a weather outlook for the likelihood and types of natural disasters forecast over the summer season. These are used to inform jurisdictional risk management strategies ahead of summer. • Ambulance authorities use geospatial tracking for their assets. GPS trackers are also worn by Australian Medical Assistance Teams (AUSMAT) on deployment overseas.
10. Please describe key activities, reference documents and plans relevant to the topic "Space for global health".	• The Australian Space Agency's Advancing Space: Australian Civil Space Strategy 2019-2028 has listed leapfrog R&D as a National Civil Space Priority Area. Space medicine and synthetic biology are listed as areas of opportunity within R&D that can grow and transform Australia's space sector. • See Question 3 response regarding the Space Health and Life Sciences.
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.*	• The SmartSat Cooperative Research Centre is currently considering a "mapping project" to identify cross-sectoral dependencies of space technology. • See Question 3 response regarding the Space Health and Life Sciences Working Group. • The Department of Health has used interactive mapping and static mapping to respond to the 2019/2020 Bushfire emergency. This included consumption of live geospatial feeds from the EMSINA network along with key health and Aged Care spatial datasets. • The Department of Health has used interactive mapping and static mapping to respond to the COVID-19 Pandemic. This included key spatial datasets such as COVID-19 case numbers, testing rates, demographic information, and vulnerable populations along with key health facilities.