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Space and global health

Responses to the set of questions regarding policies, experiences and practices in the use of space science and technology for global health

Note by the Secretariat

Addendum

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* A/AC.105/C.1/L.387.

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II. Replies received from Member States

Argentina[1]

[Original: Spanish]
[14 November 2020]

The National Commission on Space Activities (CONAE), which is the space agency of the Argentine Republic, has been working for several years on the use of space-derived information to address health issues. In particular, it has extensive experience, mainly in the field of landscape epidemiology, in the context of health-related applications, having organized meetings at the level of the Latin American region to promote collaboration and international training since 2003. The experience of CONAE in relation to the questionnaire is detailed below.

Question 1

Given that the issues concerned are complex, inter-institutional links are key to tackling public health problems. Cooperation has been maintained with the following entities in particular:

(a) Ministry of Health entities such as the Directorate of Epidemiology and its Division for National Coordination of Vector Control (National Chagas' Disease Programme and National Dengue Programme);

(b) National institutes of health research, such as the National Institute of Tropical Medicine (INMET) and the National Centre for Endemic and Epidemic Disease Diagnosis and Research (CENDIE);

(c) Research centres affiliated with universities;

(d) Provincial and municipal directorates of epidemiology.

Institutional links are established through agreements and accords that focus on specific needs and set out objectives and action plans as agreed upon by both national and international participating institutions. A further modality of interaction is through joint science and technology projects with external funding from various sources.

A summary of inter-institutional relations, which indicates the number of projects by each type of collaboration, can be seen in the conference room paper.

Question 2

The establishment of regional platforms is recommended, as such platforms would cover common health issues and could be linked to the activities of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER).

Question 4

CONAE, through its Geoportal (https://geoportal.conae.gov.ar/geoexplorer/composer), provides access to related products in general, and such information is also gathered using the country's integrated drive electronics (IDE) data server (IDERA).

Information products relating to Chagas' disease and dengue can be found on the CONAE Geoserver and through other geoservices established by entities of the Ministry of Health but maintained and updated mostly by CONAE staff.

[1] Further information provided by Argentina, which includes figures related to the questionnaire, will be made available as a conference room paper at the fifty-eighth session of the Scientific and Technical Subcommittee.

Another way of transferring information is through file transfer protocols (FTPs), as in the case of the products generated for the purposes of surveillance of the dengue vector in the city of Córdoba. These are proposed and discussed jointly with the local epidemiology directorate.

All training events and postgraduate courses involve work on access to all possible Earth observation data, including data from the European Space Agency, the National Aeronautics and Space Administration (NASA) of the United States of America, CONAE and other space agencies. Information on Latin American satellites is also shared.

Question 5

The Ministry of Health has various types of interoperable data and web services (https://sisa.msal.gov.ar/sisa).

Health data and information can be found on the servers of IDERA (www.idera.gob.ar).

Question 6

Cooperation activities are carried out on the basis of framework agreements between the aforementioned non-profit institutions. In addition, the Ministry of Science and Technology promotes remote sensing applications as an area of interest for research projects. In the light of the recent pandemic, the Government has launched a programme to link and build capacities in science and technology at the federal level with the participation of CONAE, which is partially involved in two approved projects relating to the coronavirus disease (COVID-19).

The main mechanisms currently in place at the Latin American level operate on the basis of identification of health needs and problems in the region. In order to promote shared spaces and the establishment of international academic partnerships, interdisciplinary spaces such as the postgraduate training activities of the Latin American Centre for Interdisciplinary Training (CELFI) (and others, as described in the following section) are being created. This brings together health-care professionals, Earth scientists, geoscientists, engineers and data analysts in pursuit of specific objectives focused on health issues. At the South American level, CONAE has been involved in various collaboration initiatives over the past 10 years, those initiatives taking the form of training, research, projects or advisory assistance for all countries except the Guianas. Currently, the most active cooperation with regard to health-related and similar applications is that maintained with Bolivia, Chile, Ecuador, Mexico, Panama, Paraguay and Peru. International events have been attended by experts from Belgium, Brazil, Canada, France, Italy, Spain and the United States.

Question 7

In Argentina, the training of human resources is one of the areas of activity that has been strengthened the most, ranging from the inclusion of geographical information systems and geosciences in the subjects covered during residencies in epidemiology at the national level to short online courses.

Much of the relevant postgraduate training and many research projects are carried out at the Mario Gulich Institute for Higher Space Studies, which was established through an agreement between CONAE and the National University of Córdoba. In the past three years, two CELFI training events have been held (CELFI is part of the Ministry of Science, Technology and Innovation (MINCyT)): “The multiple dimensions of dengue (2018)” and “Advanced training in landscape epidemiology” (90 people applied for a grant in order to participate). For each event, grants were awarded to cover travel expenses for participants from Latin America or living more than 90 km from Córdoba (where the two events were held). Some 30 grants were awarded on the basis of a rigorous background check of participants by a

committee established by the Science and Technology Department of the National University of Córdoba. The events were attended by 150 professionals, students and researchers (and international guests) from Argentina and other Latin American countries.

CONAE prepared and conducted an online course on the management of data on Chagas' disease in collaboration with the National Chagas' Disease Directorate. The course was organized by the Training Unit of the Ministry of Health and certificates of participation were issued. There were approximately 60 participants.

The Gulich Institute (CONAE-National University of Córdoba) offers a master's degree in space information applications. The course takes two years and consists of a 40-hour weekly schedule, a six-month internship in Italy (as part of an agreement with the Italian Space Agency) and a research project. To date, 11 theses have been completed under the programme, including 4 in the past four years.

As a result of a joint initiative implemented with the Mundo Sano Foundation, a diploma course in geomatics for health has been established. The course is conducted entirely online and in a self-contained format. The course was attended by 63 students when it was first offered in 2019; 38 students have enrolled on the course in 2020 (of whom 15 have been awarded partial grants).

An approximate representation of the number of professionals trained at the postgraduate level in the last three years (taking into account the varying durations of the courses available, which range from 14 days for intensive courses (CELFI) to two years of training (master's degree in space information applications)), is shown in the conference room paper.

Question 8

The main way to link space-derived information and information from other sources is through disease risk maps illustrating the influence of environmental factors or vectors on transmission. The decisions taken on the basis of the maps obtained are implemented by the various health organizations that have communicated the relevant needs to CONAE.

Thus, on the basis of a broad approach, CONAE strives for an ecological perspective on humankind and its environment. In general, the link with the environment is reflected in diseases that are transmitted by vectors, including rodents, or caused by bacteria, algae or contaminants in water or air (including food poisoning and respiratory diseases). More recently, it has been reflected in food production and food security. Satellite images are used as a powerful tool, not only for studying the status and evolution of environmental and geophysical parameters but also for improving our knowledge and understanding of these problems concerning human (as well as animal and plant) health, which are closely related to ecological balance (or rather, imbalance). This is evidenced clearly by the emergence and re-emergence of diseases in new geographical areas, such as the spread of dengue, Zika, yellow fever and other viruses in South America and the world in recent years, not to mention the current COVID-19 pandemic.

Taking into account the sum of several factors, including the growth of the world population, uncontrolled urbanization, the increase in population mobility, the spread of viruses and of vectors and hosts and, lastly, certain effects linked to climate change, it is clear that the frequency and scale of events that are harmful to health are increasing.

Thus, the main topics addressed by CONAE and the Gulich Institute for the purposes of research and response are the following:

(a) Neglected diseases and diseases associated with poverty: Chagas' disease, leishmaniasis, leptospirosis and intestinal parasites;

(b) Other vector-borne viral diseases: hantavirus, dengue, Zika and chikungunya;

(c) Diseases linked to the environment and extreme events: acute respiratory diseases (related to air quality), diarrhoea and poisoning (related to algal blooms, red tides and water quality in general) and flood-related diseases;

(d) Food security and access to health care.

Question 9

CONAE participates in the GIRCyT network (a network of scientific and technical bodies for disaster risk management), which recently established guidelines for the publication of products that are useful in addressing the COVID-19 emergency.

CONAE has established a direct operating procedure for requesting support during emergencies of anthropogenic or human origin (including those related to health) through the emergency registry (www.argentina.gob.ar/ciencia/conae/aplicaciones-de-la-informacion-satelital/informacion-para-gestion-de-emergencias). This enables the staff who are responsible for managing various types of space-derived products and maps to provide a rapid response.

Question 10

With regard to research, the reference documents are scientific publications (of which approximately 12 relating to health have been published in the last two years): https://ig.conae.unc.edu.ar/publicaciones.

The specific agreements concluded with the above-mentioned institutions form part of the documentation providing the basis for action, as does emergency-related information.

The YouTube channel of the Gulich Institute (www.youtube.com/channel/UCI-yqSH5XPVwnBM5mOyOCHg/videos) contains recordings of recent talks given by experts from the Institute and from CONAE in various forums, such as the World Space Week organized by the Space Agency of Paraguay (Dr. Ximena Porcasi) and the fourth Latin American Virtual Congress for the Control of *Aedes aegypti* (Dr. Marcelo Scavuzzo), including a talk on geotechnologies and remote sensing for public health applications at the Centre for the Sustainable Development Goals in Latin America (CODSpace), which is part of the Universidad de los Andes, Colombia (Dr. Verónica Andreo).

Question 11

See above.

Colombia

[Original: Spanish]
[20 November 2020]

Question 1

The Ministry of Health and Social Protection, through its Subdirectorate for Environmental Health, has concluded a memorandum of understanding with the Clean Air Institute with the aim of providing a framework for technical cooperation between the parties so that they can undertake joint action to protect human health and the environment by improving air quality and mitigating climate change.

Question 2

It is very important to consider a dedicated platform that would enable effective coordination among entities and thus strengthen intersectoral collaboration. To those ends, it would be useful to create a virtual tool that brings together information gathered by each institution in relation to various aspects of environmental health (air quality and health, climate change, chemical safety, water quality, basic sanitation and

zoonotic diseases). The tool could issue alerts regarding existing and potential future problems to the relevant bodies, thus enabling the monitoring of the aforementioned aspects of environmental health and coordination among the various entities concerned. Such coordination would also facilitate comparative research on issues of common interest and technical assistance for national and regional initiatives.

Question 3

The Directorate for Promotion and Prevention, in particular the Subdirectorate for Environmental Health, of the Ministry of Health and Social Protection of Colombia takes part in the activities of the National Intersectoral Technical Commission for Environmental Health (CONASA), which coordinates the work of its member entities in the various thematic areas of environmental health and, in particular, promotes the effective coordination of policies and strategies relating to health and the environment. In addition, CONASA monitors all productive activities that have a detrimental effect on health as a result of environmental degradation.

Question 4

Colombia is of the opinion that access to space data, particularly Earth remote sensing data, and to space technology and its applications is key to supporting the achievement of the Sustainable Development Goals and improving the management of health data. In this context, within the framework of the Colombian Space Commission, Agreement No. 8 of 14 February 2008 was concluded to promote access to and the use of remote sensing images through the National Image Bank, which is managed by the Agustín Codazzi Geographic Institute (IGAC) as the national authority responsible for cadastral, geographical, cartographical and agrological information.

The portal makes it possible to view geospatial images of Colombia and is a very special tool in that it contains not only high- and medium-resolution satellite images but also aerial photographs and maps of the entire country that IGAC has been collecting for the past 70 years.

The National Image Bank enables the online integration and sharing of geographical and satellite data, metadata, services and information obtained at the national level, thus optimizing the State's investment in the acquisition and use of satellite images. Other State entities can request and acquire images managed by the platform on the basis of a multi-user licence.

A large number of entities have donated images to the Bank, including the National Environmental Licensing Authority, the National Planning Department, the Rural and Agricultural Planning Unit and the Colombian Geological Service, which have obtained their images by downloading them free of charge or by purchasing them with a licence for multiple users. In this way, the entities actively collaborate in optimizing the State's investment in the acquisition and use of such images.

As regards the harmonization of inter-agency efforts in relation to the production and use of geographical information, document 3585 of 2009 of the National Council for Economic and Social Policy (CONPES), entitled "Consolidation of national policy on geographical information and Colombian space data infrastructure", established that data from satellite images and other remote sensors are considered fundamental data.

The document sets out the framework of coordination guidelines and standards that govern the processes of production, acquisition, recording and use of, and access to, geographical information, and states that "in order to optimize the State's investment in the acquisition and use of images from satellite-based and aerial remote sensors, the National Image Bank is to be established under IGAC, which has an efficient system for cataloguing, archiving and distributing those images and allows access to and controlled use of the images by State entities, as well as the coordination

of new images that enrich the information available in the Bank for the entities that use geographical information.”

Question 5

Geotagging is a useful tool for monitoring and managing government projects in remote locations. It also offers advantages such as cost-effectiveness and security, transparency in the handling of information and ease of reference for government entities. Its user-friendliness makes it easy to adapt, apply and analyse and it is a tool with major potential in terms of the management of assets relevant to health systems and other systems for government information. For those reasons, it is hoped that future developments complementing the use of geospatial information for national objectives can be explored.

Question 6

The Ministry of Health and Social Protection of Colombia has played a key role in intersectoral coordination and cooperation, which has enabled progress to be made in the fulfilment of a number of the policy commitments set out in the health portfolio, such as:

(a) The building of local capacity for estimating the burden of disease associated with air pollution as provided for in document CONPES 3943 of 2018, entitled “Policy for the improvement of air quality”;

(b) The strengthening of compliance with the air quality and climate change targets forming part of the environmental health pillar of the Ten-Year Public Health Plan;

(c) The identification of health co-benefits of actions to mitigate climate change that have a positive effect on the health and well-being of the public and the sustainability of the health system, as well as the establishment of strategies under coronavirus disease (COVID-19) recovery plans that are in line with the Sustainable Development Goals and climate change commitments and with national policies for sustainable development, environmental protection, clean air and public health protection.

Question 7

In January 2020, CONPES adopted the “Space Development Policy: enabling conditions for boosting national competitiveness” (document CONPES 3983) in order to promote the use of satellite technologies for the country’s productivity. The aim of the Space Development Policy is to create enabling conditions and the appropriate institutional environment for the sector to contribute, in the long term, to the country’s productivity through satellite technologies and to the modernization of agriculture, industry and services.

The actions set out in document CONPES 3983 include the implementation of a strategy to promote education, knowledge and scientific curiosity in space-related topics from a long-term perspective. To that end, the Ministry of Science, Technology and Innovation, in coordination with the Ministry of Information and Communications Technologies and with the support of the Ministry of Education and the private sector, is to implement a national strategy that includes information campaigns, training and courses to raise awareness and empower the general public through knowledge of space- and satellite-related topics, involving a range of actors.

The strategy will be aimed at the general public, national and local (departmental and municipal) government officials and actors in the education system, among other groups. The purpose of the strategy is to raise awareness of space-related topics among the general public, with a particular focus on the education sector, and thus make it possible to create enabling conditions for the promotion of knowledge with a view to the long-term development of the sector.

Question 8

Colombia recognizes that access to space data, in particular Earth remote sensing data, and to space technology and its applications has been a powerful factor in economic development and is essential for users in developing countries in their efforts to strengthen the management of health systems and other government priorities.

Given that the use of meteorological satellites could provide information on diseases that may be linked to the environment, the Subdirectorate of Environmental Health has been implementing a number of initiatives in the areas of air quality and climate change that require the satellite information analysed by the Institute of Hydrology, Meteorology and Environmental Studies and managed through CONASA.

To date, environmental health inputs based on space technology have included the Climate and Health Bulletin and support activities relating to an exploratory descriptive study on the links between climate factors and COVID-19 in various South American cities.

Lastly, the Office for Outer Space Affairs of the Secretariat is encouraged to continue its efforts to facilitate access to space in that regard and to contribute to the promotion and implementation of open data policies in order to support greater accessibility and transparency in the space domain. In addition, Colombia recommends that the Office for Outer Space Affairs develop and promote capacity-building initiatives in order to improve and increase access to and the use of space-derived information and data.

Question 9

Colombia is of the opinion that Earth observation and other space technologies play an important role in emergency response by enabling the creation of rapid response maps, detailed damage assessment, emergency communication and access to location-based damage information, as well as contributing to the identification of sites that are most appropriate for reconstruction efforts.

IGAC is the national technical entity responsible for producing the country's official cartographic and geographical information on the basis of Earth observation technologies (including crewed and uncrewed airborne and satellite platforms). The Institute has more than 80 years of technical and scientific experience in the use and application of geospatial technologies in line with global developments in the sector.

The Institute, as a leading entity and authority that is internationally recognized for its contribution of geographical knowledge in relation to its land management role in Colombia, is one of the principal users and producers of geospatial information. In 2011, the Institute and the Office for Outer Space Affairs signed a cooperation agreement (Agreement No. 4208) whereby the Institute, through its Research and Development Centre for Geographic Information, was designated a regional support office of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER), which uses space technology for disaster management. Colombia has a national plan for disaster risk management (2015–2025).

As a regional support office for the UN-SPIDER Programme, IGAC has participated in the establishment and publication of best practices in the use of optical sensor and radar images in relation to floods and droughts and has run international workshops and training courses for countries in Central America and the Caribbean.

Question 10

Colombia recognizes the considerable potential of space technologies and applications to contribute to science, the prevention and control of diseases, the promotion of health and well-being, the tackling of global health issues, the

advancement of medical research, the promotion of good health practices and the provision of health-care services to individuals and communities.

Accordingly, activities at the national level include the building of local capacity for estimating the burden of disease associated with air pollution as provided for in document CONPES 3943 of 2018, entitled “Policy for the improvement of air quality”, the strengthening of compliance with air quality and climate change targets and the identification of health co-benefits of actions to mitigate climate change that have a positive effect on the health and well-being of the public and the sustainability of the health system, as well as the establishment of strategies under COVID-19 recovery plans that are in line with the Sustainable Development Goals and climate change commitments and with national policies for sustainable development, environmental protection, clean air and public health protection.

Question 11

Given that the use of meteorological satellites could provide information on diseases that may be linked to the environment, the Subdirectorate of Environmental Health of the Ministry of Health and Social Protection of Colombia has been implementing a number of initiatives in the areas of air quality and climate change, which require the satellite information analysed by the Institute of Hydrology, Meteorology and Environmental Studies and managed through CONASA.

To date, environmental health inputs based on space technology have included the following:

(a) Climate and Health Bulletin;

(b) Support activities relating to an exploratory descriptive study on the links between climate factors and COVID-19 in various South American cities, including five Colombian cities (Bogotá, Barranquilla, Cali, Leticia and Medellín);

(c) Study on the health co-benefits of emissions reductions through the application of nationally determined contributions in Colombia.

(d) Disease burden of air pollution throughout Colombia using the AIRQ+ tool.

Egypt

[Original: English]
[20 November 2020]

Question 1

Not applicable.

Question 2

The Egyptian Space Agency, with the cooperation of the African Space Agency, can establish such a platform for Africa and connect it to the proposed United Nations platform.

Question 3

No barriers are imposed for these activities in Egypt. All space activities need only to be coordinated through the Egyptian Space Agency.

Question 4

Space-related information should be shared through coordination with the Egyptian Space Agency.

Question 5

The Egyptian Space Agency is planning to build such a database with the cooperation of the Ministry of Health, within the scope of the telemedicine programme.

Question 6

The Egyptian Space Agency started the Space Medicine Programme initiative in July 2020.

Question 7

The Egyptian Space Agency started the University satellite programme to promote space technology among undergraduate students in 2016. It is planning to expand the programme to include wider sectors of the population, such as school students and postgraduate students, and different aspects of space sciences, such as law and policies.

Question 8

The Egyptian Space Agency started the Space Medicine Programme initiative in July 2020, and is laying the foundation for telemedicine. This programme will be the first step to providing space-derived data for decision-making processes. Later, it is to be expanded into a more global health mechanism.

Question 9

Disaster management is conducted through the use of remote sensing data; these data are managed by the Egyptian Space Agency.

Malaysia

[Original: English]
[7 December 2020]

Question 1

Since 2010, the Ministry of Science, Technology and Innovation, through the Malaysia Space Agency (MYSA) and the Disease Control Division of the Ministry of Health, have formed a strategic partnership to optimize the benefits of space technology in the environmental health sector. A non-binding collaboration note was signed between the two agencies on 15 June 2012.

The main objective of the collaboration is to develop and operate an online Dengue Outbreak Management System (DOMS) in order to assist the management of the Ministry of Health in planning, monitoring and decision-making in the area of tracking and enforcing dengue-related measures throughout the country.

Since 2013, DOMS can be accessed not only by the management of the Ministry of Health and health officers at the national level, but also at the state and district health departments level. The development of DOMS is through MYSA internal experts using space-based remote sensing technology, geographical information system modelling, information and communications technology and big data analytics. The successful implementation of the system has led to the development of a spin-off product, the iDengue Portal. The iDengue Portal is a medium for disseminating accurate and up-to-date dengue information to increase public awareness and encourage the public to take part in ensuring that their residential area remains free from a dengue outbreak.

Starting 2016, the cooperation between MYSA and the Disease Control Division has been expanded to other applications to assist the Ministry of Health in efforts to

address malaria problems by developing the Malaria Geo-Reference Information and Coordination System for Malaria Elimination (MAGICs.ME). In addition, MYSA and the Disease Control Division have developed an integrated management system known as the Entomology and Online Pest Information System, or myEntoPest, to address issues related to entomology and pests throughout Malaysia.

Question 2

The Working Group on Space and Global Health should comprise representatives from the national space agency and health agencies of the member countries.

Question 3

The National Space Policy 2030, which was approved by the Government of Malaysia on 30 December 2017, provides a clear coordination framework at the national level that involves representatives from various ministries, including the Ministry of Health. This coordination framework is clearly stated under pillar one of the policy, entitled “Reinforcing governance in optimizing the country’s access to space capability”. The Government has established centralized coordination through the National Space Committee to strengthen governance in the space sector to support and improve national and global health coordination.

Question 4

Under the National Open Data initiative, MYSA provides free access to unrestricted remote sensing satellite data through the MYSA Open Data Platform, at http://rsopendata.mysa.gov.my. The unrestricted remote sensing satellite data has a spatial resolution of more than 5 metres. The data source is received from either the MYSA Satellite Data Receiving Station or external sources.

Question 5

The geotagging of all assets relevant to the health system, including the health information system, is provided by the relevant national data custodian.

Question 6

Intersectoral coordination and cooperation at the national level are implemented through the Working Group on Remote Sensing under the National Space Committee. At the regional level, it should be done through the Subcommittee on Space Applications of the Association of Southeast Asian Nations, while at the international level, it could be done through the Working Group on Space and Global Health.

Question 7

Engagement with higher educational institutions and other capacity-building is through space-related research and development collaboration projects, training and seminars.

Question 8

In line with its role to lead national space sector development, MYSA has collaborated with other ministries and government agencies, including the Ministry of Health, to enhance their services through the use of space-derived data and information access through online application systems. The National Space Policy 2030 under MYSA also has a coordination framework that involves the Ministry of Health and agencies to support the decision-making process related to health, and to harmonize and optimize the use of national resources.

Question 9

The integration of space technology and applications related to health is carried out through various application systems coordinated under the National Disaster Management Agency, including the remote sensing application systems developed by MYSA for the Ministry of Health, as described above.

Question 10

The development of the National Remote Sensing Satellite to support data services and analysis for various global issues, including global health.

Question 11 (b)

Develop a related system such as the iDengue system and the Malaria Geo-Reference Information and Coordination System for Malaria Elimination (MAGICs.ME).

Question 11 (c)

Provide a platform for research and development for space life sciences through international collaboration.

Question 11 (d)

Provide satellite images for planning and controlling the coronavirus disease (COVID-19) pandemic outbreak area.

Peru

[Original: Spanish]
[20 November 2020]

Responses provided by the General Office for International Technical Cooperation, Office of the Secretary-General, Ministry of Health of Peru

Question 1

The Ministry of Health has not signed agreements with any government agencies or public or private entities, nor does it have a regulatory framework that allows it to do so.

Question 2

It is necessary to create such spaces in order to share and access relevant information that facilitates decision-making at all levels of government, including at the international level, which would assist in addressing issues that pose a threat to the national security of Peru.

Question 3

Peru, through the Office of the President of the Council of Ministers, has established initiatives on the management of geospatial data, namely the Information System for Disaster Risk Management (SIGRID), which is linked to national defence, and the platform for the Peru Space Data Infrastructure (GEO IDEP).

Question 4

An initiative for the publication of geospatial data on the websites of the Office of the President of the Council of Ministers and the Government of Peru has been implemented with the support of the Ministry of Health and its National Centre for Epidemiology and Disease Control and Prevention.

Question 5

The National Centre for Epidemiology and Disease Control and Prevention uses but does not produce this type of information, which is recorded through the open-data portal of the Office of the President of the Council of Ministers.

Question 10

The integrated health networks (RIS-SALUD) system is a modular information system that enables the collection, analysis and interoperability of primary and secondary data from various inter-agency sources in Peru. The system integrates geospatial information through its geospatial system of integrated health networks (GEORIS) module, which makes it possible to simulate scenarios relating to the geographical coverage of integrated health networks by applying technical criteria in order to define the number of persons and the area covered by a network (population size, service coverage, geographical accessibility, population density, administrative area and integrated health sector information). The system also assists managers and senior officials in making better, timelier decisions. See www.minsa.gob.pe/rissalud/modelo-conceptual.html.

Responses provided by the Directorate General for Disaster Risk Management and National Defence in the Area of Health, Office of the Deputy Minister of Public Health, Ministry of Health of Peru

Question 1

Agreement 227-2017/MINSA, a specific inter-agency agreement concluded between the Ministry of Health and the National University of Engineering in relation to the drafting of technical documentation for work to reinforce five hospitals in the Lima metropolitan area. The work is being carried out through the Peru-Japan Centre for Seismic Research and Disaster Mitigation.

Question 2

The Emergency Operations Centre, through Technical Report No. 002-2019-ECA, recommended that the information produced by PERU SAT-1 be used to monitor natural disasters and analyse how to reduce vulnerability at the national level. PERU SAT-1 contributes to the generation of highly accurate information that can be used to monitor natural disasters and assist in the identification of hazards and the assessment of physical vulnerability in relation to the geographical coverage of health facilities. It is therefore important to establish a dedicated platform for effective coordination among United Nations entities, other international organizations and relevant actors on space and global health issues as part of international assistance and coordination efforts among countries in respect of hazard preparedness and reduction of risks to health and livelihoods.

Question 3

Act No. 29664 and its implementing regulations as approved through Supreme Decree No. 048-2011-PCM: article 30 of the Decree, entitled “Preparation subprocesses”, establishes early warning as part of preparation and response. Preparation consists of the receipt and analysis of information and organized action on the basis of hazard surveillance and monitoring systems and of the implementation of local measures and local capacity-building aimed at autonomy and resilience.

The following specific legislation has also been established to support the use of technology:

(a) Guidelines on the Establishment and Operation of the National Early Warning Network and the Establishment, Operation and Strengthening of Early Warning Systems, approved through Ministerial Decision No. 173-2015-PCM;

(b) Guidelines on the Permanent Warning Service, approved through Ministerial Decision No. 172-2015-PCM. These Guidelines establish the response measures to be taken by staff of the entities that comprise the National System for Disaster Risk Management for the purpose of preparing, disseminating information with regard to and implementing immediate and timely technical, administrative and coordination measures in the event of imminent danger or a disaster.

Questions 4 and 7

Not known.

Question 5

The Ministry of Health, through the Directorate General for Disaster Risk Management and National Defence in the Area of Health, is in the process of implementing mapping methodologies in order to tag data relating to infrastructure and facilities, but is open to using a better methodology to complete that process.

Question 6

The Ministry of Health coordinates with the National Meteorology and Hydrology Service, which produces climate maps and forecasts, in order to identify hazards and, with the support of the National Centre for Disaster Forecasting, Prevention and Risk Reduction, develop health risk scenarios – identifying areas where the risk of harm to health (in terms of injuries, outbreaks, epidemics, etc.) and of a negative impact on health services (infrastructure) is high or very high – and propose risk-reduction measures.

Question 8

In accordance with Peruvian legislation, space-derived data are analysed by technical and scientific entities – in the present context, the National Commission for Aerospace Research and Development. The resulting information is then processed by the National Meteorology and Hydrology Service and used by the Ministry of Health to generate warnings or risk scenarios and mitigate harm to health through proposals for specific interventions.

Question 9

The space data processed by the National Meteorology and Hydrology Service are used to generate:

(a) Health warnings, if the event is imminent and the public needs to be informed and the health services prepared;

(b) Risk scenarios, which make it possible to determine the likelihood of damage in high- and very high-risk areas and to prioritize interventions in those areas before the event occurs, those interventions being set out in risk prevention and reduction plans (long-term) and contingency plans (short-term).

Question 10

The activity that makes the greatest contribution to health is the risk assessment process. The information produced assists in the initial classification of hazard levels and, according to vulnerabilities with respect to the organization of health services and the local population, of the risk of damage in certain areas exposed to natural phenomena, for example, the identification of risks to health facilities on the basis of the location of those facilities, such as near riverbanks, river mouths, landfill sites or geological faults.

A key activity in the area of weather warning – a short-term warning that determines the level of danger and is issued in order to ensure preparedness – is

carried out by the Emergency Operations Centre. The Centre performs the analysis and disseminates the information and findings at the national level.

Examples of two technical documents are the Ministry of Health contingency plan for responding to heavy rains, floods and mass movements of people, 2019–2020, approved through Ministerial Decision No. 1118-2019/MINSA and the Ministry of Health vulnerability reduction plan for the cold season, 2019–2021, approved through Ministerial Decision No. 427-2019/MINSA.

Question 11

The responsible authorities in the various areas are as follows: (a) telemedicine and tele-health: Directorate General for Tele-health, Referral and Emergencies; (b) environmental health: Directorate General for Environmental Health; and (c) disaster and health emergency management: Directorate General for Disaster Risk Management and National Defence in the Area of Health.

The Emergency Operations Centre, through Technical Report No. 002-2019-ECA, recommended that information produced by PERU SAT-1, the Earth observation satellite forming part of the Peruvian satellite system, be used to monitor natural disasters and analyse how to reduce vulnerability at the national level. In that report, the Centre concluded that, while PERU SAT-1 does not make it possible to generate high-quality information at the regional level, like other satellites, it does generate highly accurate information for the monitoring of natural disasters. The Centre also concluded that, since PERU SAT-1 is not fitted with a device that generates data in thermal infrared spectral bands, the analysis of hotspots associated with epidemics is limited; nonetheless, PERU SAT-1 contributes to the identification of hazards and the assessment of physical vulnerability in relation to the geographical coverage provided by health facilities.

Saudi Arabia

[Original: English]
[9 December 2020]

Question 1

The Saudi Space Commission has started the “Space Generations (Ajyal) programme”, which is focused on nurturing national human capital in the field of space science and technology to develop activities related to health and space.

Question 2

The Saudi Ministry of Health, as a stakeholder, would recommend an online forum as a useful platform for communication. The platform should allow for programmes, issues and updates in the field to be posted and discussed as they arise.

Question 3

The Saudi Ministry of Health is in the process of developing governance mechanisms for removing barriers to the effective and efficient delivery of public health in accordance with the Saudi 2030 Programme. Once this is completed it will be integrated with other programmes such as the “Space Generations (Ajyal) Programme” and the “Orbital Slots Project”, in accordance with the guidelines of the Saudi 2030 Programme.

The Orbital Slots Project seeks to meet the need for satellite orbital slots for Saudi Arabia now and in the future to develop projects to improve the health and welfare of all citizens in the country.

Question 4

Saudi Arabia is in the planning stages of developing open-data sharing policies. The coronavirus disease (COVID-19) pandemic has led to the beginning of some basic systems to report and share data. There are plans to enhance and develop more robust systems in the future.

Question 5

The Saudi Ministry of Health has recently deployed massive numbers of health-care assets (i.e., medical devices) throughout the Kingdom. These assets are currently tracked in a traditional manner. However, the Ministry is currently looking at a more appropriate system that will cover the entire Kingdom using real-time data and geotagging.

Question 6

This project is currently under way as part of the Saudi 2030 Programme, which will address national, regional and international capacities.

III. Replies received from international organizations

International Telecommunication Union

[Original: English]
[24 November 2020]

A significant part of the activities of the International Telecommunication Union (ITU) is not in direct systems operation, but is rather foundational – such as international standards development, frequency allocations and satellite orbit coordination. Hence, several of the questions of an operational nature cannot be addressed.

The use of geotagged information is particularly relevant for applications involved in outbreak detections. This is also applicable to other applications, such as contact tracing.

Together with the World Health Organization, ITU has established the Focus Group on Artificial Intelligence for Health (FG-AI4H, www.itu.int/go/fgai4h). It is worth noting that participation in the group is open to all interested experts. The group is developing a framework for benchmarking artificial intelligence-based health solutions for assessing the quality and clinical relevance of solutions. As part of this initiative, 21 health areas are currently being explored (listed on our website), one of which is outbreak detections.

Another activity that this group has put into place in response to the coronavirus disease (COVID-19) emergency, is the ad hoc group on digital technologies for the COVID-19 health emergency, which is in the process of collecting best practices covering the use of artificial intelligence and other digital technologies for the entire epidemic emergency cycle. This ad hoc group is aiming to build upon the experiences gained for preparedness for future emergencies. In the context of infectious diseases, the use of digital technologies for contact tracing is one of the areas of key interest.

United Nations Environment Programme

[Original: English]
[24 November 2020]

The United Nations Environment Programme (UNEP) is in the process of developing a global environmental data strategy and implementing a large-scale and distributed data and knowledge platform with environmental data (the World

Environment Situation Room, the demonstration platform for which is available at https://wesr.unep.org).

UNEP is making available, on its data and knowledge platform, geotagged information with relevance to the nexus of environment and health, in particular regarding near-real-time air quality monitoring systems.

The UNEP data and knowledge platform uses geospatial and Earth observation information, as well as satellite imagery and remote sensing information, as a fundamental channel of environmental data representation, supporting decision-making and action on environmental and health-related issues (climate change, nature-based solutions and biodiversity, pollution, etc.).