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Chairperson: Mr. Al-Nasser (Qatar)

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The meeting was called to order at 3.15 p.m.

Agenda item 30: International cooperation in the peaceful uses of outer space (A/64/20)

Panel discussion on Space for global health — Space technology and pandemics

1. **The Chairperson**, recalling that the panel discussion had been organized by the Committee on the Peaceful Uses of Outer Space (COPUOS) upon a proposal by Chile, noted that the interrelated areas of global health, climate change and food security and disaster management had to be addressed holistically. Space technology applications provided tools for solutions to those major concerns.

2. **Mr. Arévalo Yepes** (Colombia), speaking as Chairman of COPUOS, observed that half of the world's population was affected by some 1,400 infectious diseases, the most widespread of which, like malaria, meningitis or cholera, were among the chief causes of death in developing countries, in addition to creating massive disruption in societies and putting a heavy burden on national health systems.

3. Disaster-management agencies in many parts of the world were having to adapt to the number of disasters caused by floods or drought, and their frequency would probably be aggravated by climate change. In addition, environmentally triggered disasters like locust plagues undermined food security.

4. Space technology applications were becoming important in fighting the spread of disease, which could now be predicted using integrated data obtained from remote sensing by satellite, global navigation satellite systems and geographic information systems.

5. After malaria, water-borne diseases like cholera and diarrhoea were the chief causes of morbidity and mortality in the developing world. Because there was a major correlation between the incidence of such diseases and environmental and climatic variables, modern early-warning systems used satellite, population, epidemiological and entomological data to forecast outbreaks, thus allowing public health officials to take appropriate measures.

6. Ensuring the global health of current and future generations was one of the main challenges in meeting the Millennium Development Goals. Climate change, disasters, food insecurity and the recent economic crisis were all likely to jeopardize the investments and

progress made so far towards providing sustainable health care for all, especially the poor and the vulnerable. National and regional policies must be better integrated across all levels and sectors to take advantage of possible synergies.

7. **Ms. Trtanj** (National Oceanic and Atmospheric Administration (NOAA), United States Department of Commerce), accompanying her statement with a computerized slide presentation, said that the recently released World Health Organization (WHO) report on emerging infectious diseases since 1970 had identified 39 new diseases, more than 1,100 epidemics, and a comeback by cholera, yellow fever, polio and meningitis. WHO believed that further progression was likely, given the nature of human interaction with the environment and with animals; and it considered the sharing of medical data, skills and technology between nations as one of the feasible routes to health security. Disease outbreaks could destabilize nations and regions, disrupting commerce, creating the loss of confidence in governments, affecting donor strategies and even leading to civil strife.

8. As to the impact of the environment on human health, environmental stressors, such as land use, climate, pollution, natural disasters or conditions and invasive species, caused changes in ecosystems that in turn affected human health and necessitated mitigation and prevention at all levels.

9. The increased development of coastal areas could lead to increased flooding, decreased biodiversity and natural habitats and the contamination of beaches, all of which had a huge impact on the health of humans, fish and marine mammals. Sixty per cent of the emerging diseases in humans were caused by pathogens transmitted by animals, mainly wildlife. It was thought that the recent avian influenza outbreak in marine mammals also had an environmental explanation.

10. The effects of climate change, including extreme weather events such as heat waves; vector- and water-borne diseases; water and food insecurity which in turn led to forced migrations and civil conflict, posed a real risk to human health. The mission of her own National Oceanic and Atmospheric Administration was to predict changes in Earth systems, and manage coastal and marine resources to meet her country's economic, social and environmental needs through climate services, forecasting, satellite, in situ monitoring, and

partnerships with the major national and international public health agencies. The particular programme she ran — the Oceans and Human Health Initiative — had been established by an Act of the United States Congress to improve understanding of oceans, coasts and lakes in order to reduce the public health risks.

11. In a changing global environment, her agency dealt with such issues as building resilient communities and adaptive management strategies, and protecting human health and well-being. It also endeavoured to gain a better understanding of the risks, capture the benefits and sustain the world's natural and human systems for future generations.

12. An exchange of expertise about the real problems, the ways of managing public health risks, and the kind of information and technologies needed would produce much better early-warning systems that anticipated outbreaks of disease three to six months in advance and enabled much faster detection, confirmation and response, thus saving lives. The basic framework for a good early-warning system involved expert assessment, monitoring and forecasting of demographic, epidemiological, environmental and social factors, using tools ranging from molecular detection to satellite imaging in order to map the health risks and develop an appropriate response strategy that was communicated to regulatory agencies for action.

13. The basic space-based methodology — several concrete examples of which were cited — could be applied also in areas of the world where the data were not as robust and where simple preventive techniques could be taught in the field to local populations. Her agency was currently working with WHO to develop a prototype system in several countries with concerns about how changes in sea-surface temperatures correlated with the transmission of vibrios and cholera in coastal environments. In addition, with colleagues at the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER), an effort was under way to apply space-based technology to land-based sources of cholera and flooding, and develop a comprehensive space-based, sea-based and land-based system. In other instances, space-based weather forecasting had been used effectively to predict that rainy seasons would be followed by drought and thus to prepare the population for those attendant health risks. Early-warning systems had a 10-year history of managing malaria well, especially in Africa, using several different models

relying on seasonal forecasting and satellite imagery. Disease management, however, always required data from multiple platforms: satellite imagery, though a good start, had to be combined with real-world data, such as prevalence rates, human-animal interaction, and hands-on experience with a particular disease and culture. Because Earth was a complex system of systems, space-based science had to connect with the Earth observation community, the public health and disaster management communities, the environment, agriculture and fisheries communities and the ocean and coastal management communities; and in all cases, the social and cultural context had to be factored in because the message and the action had to be socially palatable.

14. The vision for the future would include high-tech monitoring of toxic events using a combination of land-based and remote detection or, more simply, training people on the ground to do their own monitoring and understand their own systems. It depended on the nature of the problem, the nature of the country and the kind of solution sought. Either approach would require experts to define the problem, develop the tools and plan collectively for the health impact of a changing environment in order to prevent or at least reduce the emerging health risks. They would have to focus on issues beyond their own disciplines and engage the decision makers early and often. A number of cutting-edge projects to reduce public health risks were already being set up in partnership with WHO, UN-SPIDER, the Global Earth Observation System of Systems (GEOSS) and the Committee on Earth Observation Satellites.

15. Space-based observations must be applied as a common resource for the common good, to reduce regional vulnerability to natural and man-made change; establish a baseline for tracking environmental effects in order to inform policy, evaluation, planning and monitoring; build predictive capability and planning across timescales; change institutions and political will; and empower people, protect the environment and save resources.

16. **Ms. Othman** (Director, United Nations Office for Outer Space Affairs), illustrating her statement with a computerized slide presentation, said that climate change played a major role in the spread of infectious diseases and that many of its effects, such as drought and flood, made for a vast array of emergencies, all of them compounded if disease became involved. Health-

related MDGs 4, 5 and 6 were beset by a vicious cycle, in which infectious diseases mainly affected the poor and were a major cause of poverty. Control of such diseases was therefore a precondition for the elimination of poverty and the attainment of the MDGs, since child mortality, maternal health and HIV/AIDS were all related to infectious diseases.

17. In respect of the role of space science and technology, Earth-observing satellites provided a transnational picture of vector-borne diseases. Space-based data also helped scientists predict high-risk areas prior to an outbreak, while integrated data from Earth-observing, meteorological and navigational satellites could track environmental changes and identify epidemic-prone areas. New satellite platforms, equipped with improved payloads, had also been deployed, enhancing spectral, spatial and temporal resolutions, as well as the picture of risk factors, and allowing experts to make better informed decisions. Satellite data had also been used to measure temperature, humidity and vegetation in order to estimate the number of people at risk from malaria. Such data were subsequently combined with terrestrial in situ data on selected rural villages to estimate how many villagers risked infection.

18. The Office's health-related activities included an assortment of meetings and programmes: the 2006-2007 pilot project on telemedicine in the reconstruction of Afghanistan, and the 2008 workshop on tele-epidemiology in Cuba. A projection risk stratification of dengue fever was still being developed for Colombia with a view to identifying likely areas of dengue transmission, using high-resolution satellite images and linking those areas to other social and cultural factors. The next phase aimed at identifying those areas through high-resolution optical and satellite radar.

19. Referring to UN-SPIDER, she said that it served as a gateway to space information for disaster management support and as a bridge between disaster management and space communities; it also facilitated capacity-building and institutional strengthening. The programme's three-cornered concept comprised the UN-SPIDER team, residing in Vienna, Bonn, and shortly in Beijing; a network of regional offices; and the national focal points, the last two of which would be the focus of the main activities.

20. The regional offices in Japan, Nigeria and the Islamic Republic of Iran would soon be joined by one

in Algeria. Activities in 2009 had included contributions to the World Congress on Disaster and Emergency Medicine, held in May in Victoria, British Columbia, and the GEOSS health and environment workshop held in July in Geneva. Wednesday 21 October would be the opening day of the Third United Nations International UN-SPIDER Bonn Workshop, on disaster management and space technology, with a special session on disaster medicine, telemedicine and integrated vector management (IVM) for malaria control.

21. UN-SPIDER was also conducting a technical advisory mission in Burkina Faso, with the aid of international experts, to discuss locust control. A similar mission had also been carried out in Namibia, with the United States National Aeronautics and Space Administration (NASA), the United States National Oceanic and Atmospheric Administration and the German Space Agency as partners. The aim of the mission had been to help the Government to implement a flood/disease sensor web pilot project.

22. Her Office would continue to focus on global health issues and would welcome Member States' proposals for hosting workshops, providing experts and other contributions in order to raise awareness of the role of space science and technology in the elimination of global health problems.

23. **Mr. González** (Chile) said that it had been particularly useful to hear the various presentations under that agenda item, including those of previous years, which had dealt with climate change, space technology and food security. The data presented by the panellists had been relevant to Member States' needs, and delegations would take them back to their countries. It was regrettable, however, that WHO, the specialized agency most concerned with the subject, had not been present. He enquired whether it had been invited.

24. **Ms. Pessoa** (Brazil) said that it was important for developing countries to have access to space technology, and that capacity-building was vital to accessing, interpreting and modelling space data. As illustrated by Ms. Othman's presentation, UN-SPIDER provided one end of what was needed for space application as a tool for sustainable development, especially where health was concerned. She wished, however, to underscore the equal importance of the space applications programme, under which a number

of capacity-building initiatives had been taken. It was crucial that the Office should have the capacity to support both those programmes.

25. **Ms. Trtanj** (National Oceanic and Atmospheric Administration, United States Department of Commerce), replying to the representative of Chile, said that her agency had worked hard to develop its partnership with WHO. She appreciated the need for partners to be present at the discussion, and concurred with his sentiment.

26. **Ms. Othman** (Director, United Nations Office for Outer Space Affairs) said that WHO had in fact been invited to the panel. Although it had accepted, it had had to withdraw at the last minute. Replying to the representative of Brazil, she confirmed that her Office indeed looked forward to developing both programmes.

27. **Mr. Arévalo Yepes** (Colombia) stressed that the question of telemedicine, often treated as a peripheral issue, should be brought to decision makers' attention. There was also a need for collective endeavours with international agencies at the global and regional levels alike. A regional approach was needed, making the involvement of regional agencies important.

28. **The Chairperson** thanked the panellists for their informative presentations and comments.

29. **Mr. Arévalo Yepes** (Colombia), speaking as Chairman of COPUOS and introducing the Committee's report (A/64/20), said that, while the United Nations system played a fundamental role in helping to promote international cooperation in space activities for the benefit of all countries, he wondered whether it was doing enough to ensure that no one was left behind and was addressing the global society's main concerns in a responsible manner. In close coordination with Member States, it should find holistic solutions to current and emerging problems through sustainable uses of outer space. The time had therefore come to outline clear objectives in order to strengthen that coordination, especially regarding the role of space tools for global development agendas.

30. For almost half a century, COPUOS had sought to bring the benefits of space technology to all humankind. After the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III), the Committee had aligned many of its activities with the MDGs. The results had been impressive, as in the case of the establishment of

UN-SPIDER and of the International Committee on Global Navigation Satellite Systems.

31. The development of space science and technology was a prerequisite for protecting the planet and space and for any exploration of the universe. COPUOS was helping to create national space commissions and coordinating bodies in all regions and to establish regional cooperative structures. An unprecedented number of agreements now existed on space cooperation among nations, space agencies and the private sector.

32. In response to General Assembly resolution 63/90, which had highlighted the need for regional and interregional cooperation, preparations were under way for the Third African Leadership Conference on Space Science and Technology for Sustainable Development, to be held in Algiers in November. He had attended the fifteenth session of the Asia-Pacific Regional Space Agency Forum, held in Hanoi and Ha Long Bay, Viet Nam, at the end of 2008, and had been impressed by its organization, as he was by the very promising coordination efforts between the Forum and the Sentinel Asia project, and other regional programmes and initiatives, especially the education committee, which worked with the Latin American region. In that connection he looked forward to the holding of the sixth Space Conference of the Americas, in Mexico in 2010, and of the International Air and Space Fair in March 2010 in Chile.

33. Highlighting the role played by the regional centres for space science and technology education in promoting cooperative efforts and the solid infrastructure they constituted for advanced training in space science and technology, with their highly successful educational programmes, he commended the directors of the regional centres, all of whom had that year submitted programmes and workplans to the Committee.

34. In 2009, the Committee had examined two new topics: space and climate change, and the use of space technology in the United Nations system, while the Inter-Agency Meeting on Outer Space Activities had revamped its annual reporting mechanism and submitted a report on its new topic directly to the Committee.

35. Turning to the Scientific and Technical Subcommittee, he noted that its Working Group of the Whole was considering the implementation of the

UNISPACE III recommendations, while its Working Group on Near-Earth Objects would be considering recommendations on an international response to the threat of asteroid impacts; and the adoption of the Safety Framework for Nuclear Power Source Applications in Outer Space by its Working Group on the Use of Nuclear Power Sources in Outer Space, and its endorsement by both COPUOS and the International Atomic Energy Agency (IAEA), demonstrated the good working relationship between those two bodies. The Subcommittee itself had been working well with the Legal Subcommittee and the Inter-Agency Space Debris Coordination Committee (IADC) to encourage States to follow the COPUOS Space Debris Mitigation Guidelines.

36. A key area of the Legal Subcommittee's work was building capacity in space law through education, research and development and dissemination of information. It would be reviewing the draft outline of a basic course on space law to be given by the regional centres for space science and technology education affiliated to the United Nations, which had been prepared by the Office for Outer Space Affairs in cooperation with expert educators and the directors of the regional centres. In addition, the new Working Group on National Legislation Relevant to the Peaceful Exploration and Use of Outer Space established that year had helped the Subcommittee to make progress in its consideration of the main legislative developments taking place at the national level in order to identify common principles, norms and procedures.

37. With the rapid globalization of the space sector as more States sought to develop their space capabilities and more non-governmental actors entered the field, all involved must take a more inclusive approach while also bearing in mind the critical needs of key segments of the global societies. By providing a unique platform within the United Nations for dialogue with outside partners, COPUOS and its Subcommittees had an enormous part to play as the main intergovernmental body in the space arena. Consequently, a rational policy consistent with the United Nations objectives and priorities was essential to the development and application of space activities for the benefit of humanity. That comprehensive approach would give a general direction to a broad spectrum of stakeholders in the field and would help coordinate the management of regional, interregional and global space activities. Member States must work more closely with the entire

United Nations system so that they could respond collectively to the rapidly evolving challenges in the space sector, building on the achievements of UNISPACE III.

38. **Mr. González** (Chile), referring to draft resolution A/C.4/64/L.4, which his delegation and that of Mexico had submitted to the Committee, announced that it was being withdrawn. The draft had been the result of a mandate to his delegation and of formal and informal consultations. Delegations from outside the Latin American region had expressed some concerns about the draft and, in the interests of democracy, those concerns were being respected. Further consultations would be held on the draft in Vienna to try to reach a consensus. The two most recent space conferences held in the Americas — in Cartagena de Indias, Colombia, and Quito, Ecuador respectively — had been extremely successful and had generated the idea of interregional cooperation, a fact he would like to see reflected in the relevant draft resolution.

The meeting rose at 4.55 p.m.