



# *Science and Survival*

A focus on SARS-CoV-2 and connections between large scale risks for life on this planet and opportunities of science to address them

*The Pontifical Academy of Sciences Plenary Session, 7-9 October 2020*





The crisis has shown us that, especially in times of need, we depend on our solidarity with others. In a new way, it is inviting us to place our lives at the service of others. It should make us aware of global injustice and wake us up to the cry of the poor and of our gravely diseased planet.

*His Holiness Pope Francis*

*preface to the book “Communion and Hope”, Vatican Publishing House (LEV) - June 2020*



Pope Francis, 'Urbi et Orbi', St. Peter's Square, March 27, 2020

## *The context and emphasis of the 2020 Plenary*

### **CONCEPT NOTE**

The 2020 PAS plenary is guided by the idea that the role of science is critical for the survival of humanity – in view of the SARS-CoV-2/COVID-19 crisis probably more so than ever. The conference also addresses interlinkages between health, large-scale risks for people, and planetary health, as well as opportunities of science to facilitate addressing and contributing to solve them.

The Plenary 2020 builds on deliberations by the Pontifical Academy of Sciences earlier this year, that led to a joint statement by PAS & PASS and an international dialog in a virtual event on Health of People, Health of Planet, Our Responsibility. A lot has been learned about the pandemic in the past ¾ of a year, and scientists need to share and compare insights. We highlight here key science related observations from PAS statements, which form the background of this 2020 Plenary session.

#### **Strengthening Science and responsible actions by scientific communities:**

Health systems need to be strengthened in all countries. The need for early warning and early response is a lesson learned so far from the COVID-19 crisis. It is vitally important to get ahead of the curve in dealing with such global crises. We emphasize that public health measures must be initiated instantaneously in every country

to combat the continuing spread of this virus. The need for testing at scale must be recognized and acted upon, and people who test positive for COVID-19 must be quarantined, along with their close contacts.

Governments, public institutions, science communities, and the media (incl. social media) failed to ensure responsible, transparent, and timely communication, which is crucial for appropriate action. International organizations like WHO and UNICEF, but also academies of sciences, need to be supported in their communication efforts so that their scientific evidence-based information can rise above the cacophony of unproven assumptions spreading all over the world.

Strengthening basic research enhances the capacity to detect, to respond, and to ultimately prevent or at least mitigate catastrophes such as pandemics. Science needs better funding at a national and transnational level, so that scientists have the means to discover the right drugs and vaccines. Pharmaceutical companies have a key responsibility to produce those drugs at scale if possible.

Scientists in all nations already tend to serve with a global perspective when generating preventions and cures. This humane attitude needs further

support. Professional associations and science academies need to check whether they can serve better in cooperation with international agencies such as WHO and others, and how.

An important research area is understanding the root causes and prevention of zoonotic diseases, i.e. infectious diseases caused by bacteria, viruses, or parasites that spread from animals to humans. Food-related animal production systems may need reshaping to reduce the risks of zoonotic breeding grounds. We also need to know more about the psychological foundations of human behavior in situations of collective stress, in order to decide on appropriate governance strategies in crises.

**Strengthening solidarity and compassion:**

Global problems such as pandemics or the less visible crises of global climate change and biodiversity loss demand global cooperative responses. We must take into account the relationships between human activities, global ecology and livelihoods. Once COVID-19 is under control, we cannot go back to business as usual. A thorough review of worldviews, lifestyles, and short-term economic valuations must be carried out to cope with the challenges of the Anthropocene. A more responsible, more sharing,

more equalitarian, more caring and fairer society is required if we are to survive.

We insist that global crises demand collective action. The prevention and containment of pandemics is a global public good (*Laudato Si'*) and protecting it requires increased global coordination as well as temporary and adaptive decoupling. At a time when rule-based multilateralism is declining, the COVID-19 crisis should encourage efforts to bring about a new – in the sense of different – globalization model aimed at inclusive protection of all.

We are concerned about the selfishness and shortsightedness of uncoordinated national responses. This is the time to prove that the “Family of Nations” (Paul VI and John Paul II) or the “Family of Peoples” (Pope Francis) are communities of values with a common origin and shared destiny.

Broad-based policy action in the field of public health is essential in all countries to protect poor and vulnerable people from the virus. A lesson the pandemic teaches us is that, without solidarity, freedom and equality are just empty words (Pope Francis).

*Prof. Joachim von Braun - PAS President*  
*H.E. Msgr. Marcelo Sánchez Sorondo - PAS Chancellor*

The 2020 PAS Plenary is guided by the idea that the role of science is critical for the survival of humanity – in view of the COVID-19 crisis probably more so than ever.

The program is composed of three virtual sessions (by Zoom).

A summary statement on the conference outcomes shall be developed and published by the Pontifical Academy of Sciences (PAS). Sessions will be recorded and placed on the PAS website [www.pas.va](http://www.pas.va) and YouTube channel [www.youtube.com/c/CasinaPioIV](https://www.youtube.com/c/CasinaPioIV)

**Wednesday, October 7th 2020, 2 pm to 4:30 pm CET**

2:00-2:10      *Welcome and Introduction to the Plenary*  
**Joachim von Braun**  
**Msgr. Marcelo Sánchez Sorondo**

*Session 1: SARS-CoV-2 & COVID-19  
and other infections – scientific insights and health policy*

2:10-2:20      *Introduction by Chair Wolf Singer*

2:20-2:35      **Tedros Adhanom Ghebreyesus**  
Global health policy responses to current and future pandemics

2:35-2:40      *Discussion*

2:40-2:55      **Francis Delmonico and Ann Woolley**  
Update on testing and on the development of a COVID-19 vaccine

2:55-3:00      *Discussion*

3:00-3:15      **Ada Yonath**  
The genetic code translation machinery as a therapeutical target

3:15-3:20      *Discussion*

3:20-3:35      **Salvador Moncada**  
Cardiovascular risk factors in SARS-Cov-2 infection:  
prevention and treatments

3:35-3:40      *Discussion*

3:40-3:55      **Barbara Burmen**  
Tuberculosis prevention in childhood - Field research in Kenya

3:55-4:00      *Discussion*

4:00-4:30      *Cross-cutting discussion and conclusions by Chair*

*Possible Message from Pope Francis*

**Thursday October 8th, 2020, 2 pm to 4:30 pm CET**

***Session 2: SARS-CoV-2 & COVID-19  
Global health, bio-/digital transformations, and health for all***

- 2:00-2:10      *Introduction by Chair Joachim von Braun*
- 2:10-2:25      **Francis Collins**  
Science and Survival – with a focus on SARS-CoV-2 and  
opportunities of science
- 2:25-2:30      *Discussion*
- 2:30-2:45      **Marcia McNutt**  
Science systems responses to pandemics
- 2:45-2:50      *Discussion*
- 2:50-3:05      **Chen Chien-Jen**  
Controlling pandemics – science and public health
- 3:05-3:10      *Discussion*
- 3:10-3:25      **Mohamed Hassan**  
Role of academies of science in promoting international collaboration  
in health sciences
- 3:25-3:30      *Discussion*
- 3:30-3:45      **Vanderlei S. Bagnato**  
Therapeutics and accessibility of the poor for treatment
- 3:45-3:50      *Discussion*
- 3:50-4:05      **Tolu Oni**  
Health-proofing the future: a planetary health foresight approach  
to post-COVID-19 reset in rapidly growing cities
- 4:05-4:10      *Discussion*
- 4:10-4:30      *Cross-cutting discussion and conclusions by Chair*



Friday October 9th, 2020, 2 pm to 4:30 pm CET

*Session 3: SARS-CoV-2 & COVID-19  
Science and the understanding of risks and uncertainties*

- 2:00-2:10      *Introduction by Chair Martin Rees*
- 2:10-2:25      **David Spiegelhalter**  
Statistical analyses of risks and uncertainties related to pandemics
- 2:25-2:30      *Discussion*
- 2:30-2:45      **Ara W. Darzi**  
Future public health systems
- 2:45-2:50      *Discussion*
- 2:50-3:05      **Ewine van Dishoeck**  
Lessons from astronomy for global collaboration and education
- 3:05-3:10      *Discussion*
- 3:10-3:25      **Mohlopeni Marakalala**  
TB control in the Covid19 era
- 3:25-3:30      *Discussion*
- 3:30-4:10      *Cross-cutting discussion and conclusions by Chair*

Wednesday, October 28th 2020, from 4 pm to 6 pm CET

*Closed Session for Academicians*




1. Briefing about planned PAS program 2021
2. PAS publications update
3. Self-presentations of new Academicians (5 minutes each)
4. Commemorations of deceased Academicians (5 minutes each)

*Frank Press (+ 29 January 2020, Earth and Environmental Sciences) V. Ramanathan  
Manfred Eigen (+ 6 February 2019, Chemistry, Nobel Prize 1967) Gerhard Ertl  
George V. Coyne (+ 11 February 2020, Astrophysics) Brother Guy Consolmagno  
Daniel Adzei Bekoe (+ 5 September 2020, Chemistry–X-ray Crystallography)  
Govind Swarup (+ 7 September 2020, Astrophysics) Pierre Léna  
John Barrow (+ 27 September 2020, Physics and Mathematics) Martin Rees*

5. Any other business

## Science and Survival

### LIST OF SPEAKERS

	<b>Vanderlei S. Bagnato</b> PAS Academician University of Sao Paulo		<b>Salvador Moncada</b> PAS Academician Manchester Cancer Research Centre University of Manchester
	<b>Barbara Burmen</b> Medical Research Institute Center for Global Health Research Kenya		<b>Tolu Oni</b> Public Health Physician Scientist and Urban epidemiologist University of Cambridge Global Public Health Research Program
	<b>Chen Chien-Jen</b> Epidemiologist Senior research fellow Academia Sinica Fmr Vice President of Taiwan		<b>Martin Rees</b> PAS Academician Emeritus Professor of Cosmology and Astrophysics University of Cambridge Astronomer Royal
	<b>Francis Collins</b> PAS Academician Director National Institutes of Health (NIH)		<b>Msgr. Marcelo Sánchez Sorondo</b> PAS Chancellor Emeritus Professor of the History Philosophy LUMSA University, Rome
	<b>Ara W. Darzi</b> Imperial College London		<b>Wolf Singer</b> PAS Academician Max Planck Institute for Brain Research Frankfurt
	<b>Francis Delmonico</b> PAS Academician Harvard Medical School		<b>David Spiegelhalter</b> University of Cambridge Statistical Laboratory Centre for Mathematical Sciences
	<b>Tedros Adhanom Ghebreyesus</b> Director General WHO		<b>Ewine van Dishoeck</b> Molecular Astrophysics at Leiden Observatory President of the International Astronomical Union
	<b>Mohamed Hassan</b> PAS Academician Sudanese National Academy of Sciences		<b>Joachim von Braun</b> PAS President Center for Development Research (ZEF) University of Bonn Bonn (Germany)
	<b>Mohlopeni Marakalala</b> African Health Research Institute University College London and University of Cape Town		<b>Ann Woolley</b> Harvard Medical School
	<b>Marcia McNutt</b> President National Academy of Sciences (NAS)		<b>Ada Yonath</b> PAS Academician and Nobel Prize Laureate Helen and Milton A. Kimmelman Center for Biomolecular Structure and Assembly of the Weizmann Institute of Science



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