Scientific Advisory Group on the Origins of Novel Pathogens (SAGO)

An opportunity to better guide studies that specifically investigate high-threat pathogens

Meeting on Preparing for Pathogen X
29-30 August 2022

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Preparing for the next ‘Disease X’

SARS-CoV-2 was a Disease X, there are many emerging and re-emerging zoonoses with pandemic potential, as we have seen before:

- Respiratory pathogens
- Viral Hemorrhagic Fevers
- Arboviruses
- Orthopoxviruses
- Other zoonoses

Renewed focus on One Health

- Development of a comprehensive risk assessment framework and global risk monitoring system
- Strengthening cross sectoral solutions
- Strengthening countries’ capacities
- Enhanced preparedness in hot spots to improve early detection, alert and response
Scientific Advisory Group on Novel Origins (SAGO)

SAGO has been formed in the context of the continued threat of the emergence or re-emergence of pathogens with epidemic and pandemic potential.

The Need

• A global framework to study future emerging and re-emerging pathogens, including
  • Comprehensive and coordinated studies
  • A holistic approach to study the emergence of high threat zoonotic pathogens including the animal human interface, environmental safety, biosafety and biosecurity
  • An established framework for studying emerging pathogens where and when they emerge

Addressing a gap

• A scientific advisory group to advise WHO on technical and scientific considerations regarding origins of emerging and re-emerging pathogens:

The Scientific Advisory Group for the Origins of Novel Pathogens (SAGO)
In its capacity as an advisory body to WHO, the SAGO will follow the terms of reference as initially outlined and shall have the following functions:

1. To advise WHO on the development of a WHO global framework

2. To advise WHO on prioritizing studies and field investigations into the origins of emerging and re-emerging pathogens of epidemic and pandemic potential, in accordance with the WHO global framework described in point (1) above; 2

3. In the context of SARS-CoV-2 origins:
   a. To provide an independent evaluation of all available scientific and technical findings from global studies on the origins of SARS-CoV-2;
   b. To advise the WHO Secretariat regarding developing, monitoring and supporting the next series of studies into the origins of SARS-CoV-2

4. To provide additional advice and support to WHO, as requested by the WHO Secretariat, which may include participation in future WHO-international missions to study the origins of SARS-CoV-2 or for other emerging pathogens.

Source: SAGO TOR
SAGO - Composition

• Up to 25 members

• Members must have significant expertise in one or more of the following technical disciplines to ensure a one health approach:

  infectious disease epidemiology and conducting epidemiological studies, field research, virology, ecology, molecular epidemiology, sero-epidemiology, medicine, bioinformatics, outbreak analytics, health statistics, microbiology, veterinary medicine, food safety, bacteriology, environmental science, biosafety, biosecurity, occupational health and safety, or laboratory safety and security, ethics and social sciences, or other activities related to the emergence or re-emergence of pathogens of pandemic potential.

• Geographic representation, gender balance, declaration of interest

• Members of the SAGO shall be appointed to serve for a period of 2 years and shall be eligible for reappointment
Meetings and Organization of the SAGO

- First meeting November 2021
- 11 plenary SAGO meetings held to date
- 27 members with significant and diverse expertise acting in their individual capacity
- Chair and Vice-Chair (Prof Marietjie Venter Dr Jean-Claude Manuguerra)
- 3 observers
- 6 sub-working groups were formed and are meeting regularly
  - Human, epidemiology
  - Animal/Human Interface,
  - Environment/Ecological,
  - Early Investigation/Anthropology,
  - Biosafety/Biosecurity, and
  - Genomics/Phylogenetics

Current Main Areas of Focus

1. Provide recommendations to establish a Global Framework for studying the origins of emerging and re-emerging pathogens.

2. Review available evidence on the emergence of SARS-CoV-2 and provide recommendations for studies urgently needed.

3. Provide preliminary recommendations to study the emergence of SARS-CoV-2 VOCs.
SAGO first plenary meeting

- 30 November 2021
- 23 November 2021

- Chinese Scientists presented

- SAGO chair sent letter #1 to WHO to request studies from China

- Chinese Scientists presented

- SAGO chair sent letter #2 to WHO to request studies from China

- DG sent letter #3 to China

- Plenary Meeting 2

- 9 December 2021

- Plenary Meeting 3

- 15 December 2021

- Plenary Meeting 4

- 14 January 2022

- Plenary Meeting 5

- 19 January 2022

- Plenary Meeting 6

- 31 January 2022

- Plenary Meeting 7

- 14 February 2022

- Plenary Meeting 8

- 10 March 2022

- Plenary Meeting 9

- 14 February 2022

- 8 April 2022

- 14 April 2022

- First in-person plenary meeting

- DG sent letter #4 to China

- SAGO first report to WHO

- 1-2 June 2022

- SAGO first report published

- 9 June 2022

- Ongoing work

- SAGO working groups (20 meetings)

- January-March 2022

- SAGO activity timeline since member election
The SAGO at its first in-person meeting in June 2022

- 27 Members with significant and diverse expertise
- Chair and vice-chair
- 2 Observers FAO/OIE
Work of the SAGO and planned outputs

**SAGO Framework**

*General Recommendations for investigations/studies on the origins of Novel Pathogens*

- Define scope of work
- Review Framework elements from working groups
- Define topics and studies within each working group

**SARS-CoV-2 origins next phase of investigations**

- Review available findings: March 2021 WHO/China joint report and recommendations on next series of studies
- Review information received from China, who will provide update on studies conducted since March 2021 and provide any new findings on COVID-19 that inform potential origins
- Apply elements from overarching framework to identify gaps in research studies
- Provide recommendations to WHO on urgent actions related to studying the origins of SARS-CoV-2 origins as the first SAGO report and potential origins of Omicron/new variants
SAGO – First preliminary report to WHO

- Background on the formation and meetings of the SAGO
- Overview of the scientific discussions of SAGO plenary and technical working group meetings
- Initial recommendations for the development of a global framework to study emerging and re-emerging pathogens of pandemic potential
- Applying the global framework elements to develop preliminary recommendations for the studies needed to advance our understanding of the emergence of SARS-CoV-2 and its variants of concern
- Review of available findings to date on our understanding of how the COVID-19 pandemic began- comment that not yet complete.
Recommended studies for SARS-CoV-2 in the report for scientists to prioritize

**Epidemiology recommendations**

- Morbidity surveillance, pharmacy purchase; mass gathering events; Mortality surveillance
- Identification of early cases and role of the Huanan market in early cases
- Case-searching (<Dec 2019, serological evidence & severe acute respiratory Infection surveillance; wastewater)
- Laboratory testing - Cross reference confirmation by external labs

**Molecular epidemiology recommendations:** Link animal/human database; ACE-2 binding domain evolution; furin binding site, continued evolution of variants in human populations and animals.

**Animal and environment recommendation**

- Pathway of emergence from wildlife / intermediate hosts to humans; susceptible species, origin of animals at markets
- Food/cold chain hypotheses; environmental contamination

**Introduction of SARS-CoV-2 to the human population through a breach in biosafety or biosecurity measures:**

- Breach in biocontainment, occupational hazards for labworkers or field investigations

**Origins of SARS-CoV-2 variants of concern:** under surveillance populations; immunosuppressed host; new animal reservoirs
• **Meeting the need**
  • The rapid emergence and spread of SARS-CoV-2 has highlighted the importance of being prepared for any future event. The need to be able to quickly identify novel pathogens early and to identify the risk factors that contribute to their emergence and spread.

• **Discussions of framework involve**
  • Early investigations following the emergence
  • Human studies: epidemiology
  • Human/Animal Interface studies
  • Retrospective sampling of pre-outbreak samples
  • Environmental/Ecological studies
  • Biosafety/Biosecurity
  • Genomics/Phylogenetics

• **Applying this framework to SARS-CoV-2 variants of concern: e.g., Omicron**
• **Apply framework to other emerging pathogens: Monkeypox; Ebola...**
Next steps

• Define and develop the Workplan for SAGO for 2022/2023

• To continue to meet in plenary and as working groups to attain the objectives set out in their TORs
  • Continue development of the global framework (expected output third or early fourth quarter 2022)
  • Advancing the studies needed into the origins of SARS-CoV-2 that are outlined in the SAGO report
  • Applying the global framework to emerging and re-emerging pathogens origin investigations (e.g., SARS-CoV-2 VOC, monkeypox)

• Plan for series of virtual meetings (June 2022 and monthly) and in-person meetings (TBD November 2022)

• Define next SAGO outputs (e.g., reports to WHO, papers for peer-review, presentations with other TAGs/SAGs).
Thank You

SAGO webpage: https://www.who.int/groups/scientific-advisory-group-on-the-origins-of-novel-pathogens-(sago)

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