Science Advice in Health Emergencies

Introduction

Science advice may be described as "the process, structures, and institutions through which governments and decision-makers receive and consider science and technology input to public policy development[1]. It helps policymakers make informed policy choices from suitable options provided by scientists on a given topic[2]. Though there are many players in the science advice ecosystem, there are generally four structures/channels for scientific advice: advisory councils, advisory committees, national science academies, and chief scientific advisors (CSAs).

Ideally, scientific advice is independent of political or institutional interests. It brings together evidence and insights from different disciplines and approaches to better understand the natural, social, scientific, and technological determinants of issues under consideration. Acceptance of a final recommendation or position will be more likely if the advisory process is robust and interdisciplinary (and with certain key requirements met). Objectivity is a key requirement; science advice should state what is known and what is unknown about a certain issue, the data-backed implications of various policy decisions, as well as communicate the inherent biases. Public accountability and transparency are also essential to maintain public trust in the science advisory process. Therefore the advice should be made publicly available. Overall, there is a need for policymakers and scientists to work together. Additionally, societies' global nature has necessitated that science advice become an essential component of diplomacy and international relations.

Science Advice in Emergency Situations

Science advice is vital in both emergency and non-emergency situations. In non-emergencies, scientific advice is more structured, driven by policy needs and is usually from highly specialized sources such as joint research centres, dedicated expert groups, political strategy think-tanks, and specialized committees[3]. In emergencies, the need for science advice is particularly more urgent,

Key Messages

- ***Promote coordination, partnerships, and collaboration amongst stakeholders; nationally and regionally***
- ***Institutionalize mechanisms for science advice into decision-making centres***
- ***Enable quality science and evidence***
- ***Prepare for future emergencies***
- ***Reevaluate messaging, messengers, and communication***

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1 Quirion R, Carty A, Dufuor P, and Jabr R. (2016). Reflections on science advisory systems in Canada. Palgrave Communications, DOI:10.1057/palcpomms.

2 Pielke, R. Jr. (2007). The Honest Broker: Making Sense of Science in Policy & Politics, Cambridge University Press.

3 European Commission. Strengthening Evidence Based Policy Making through Scientific Advice. May 2015. Retrieved from https://ec.europa.eu/research/sam/pdf/strengthening_evidence_based_policy_making.pdf

as it provides crisis managers and other decision-makers with evidence-based data to respond promptly to crisis situations[4]. A crisis is a challenging and unstable situation that requires reliable and appropriately presented data and scientific knowledge in a short time to inform the immediate situation analysis and support of the crisis. The general public, including West Africa, deserves the strengthening of the delivery of infectious disease risk information in a fast, transparent, verifiable, and non-politicized manner[5] to help mitigate health crises. The recent coronavirus disease (COVID-19) pandemic provides an example of the importance of an efficient public health information system.

Study Rationale and Process

In ensuring that the West African sub region is better prepared to address current and likely future public health emergencies, it is important to identify which mechanisms work best for providing science advice in the sub-regional context, as well as how science advice in health emergencies may be strengthened. To this end, the Nigerian Academy of Science (NAS), Académie Nationale des Sciences, Arts et Lettres du Bénin (ANSALB), and the Nigerian Young Academy (NYA), constituted a Study Committee (comprised of experts from within and outside Africa) to conduct a rapid consensus study on science advice in West Africa, particularly in health emergencies. Specifically, the Committee was tasked with examining the existing mechanisms for science advice in West Africa and their effectiveness in health emergency situations. Through a review of available literature, and consultation with experts and other relevant stakeholders, the Study Committee prepared this policy brief, detailing its findings and recommendations.

Findings

Situation of Science Advice in West Africa

- Although most West African countries have science, technology and innovation policy plans, the science-policy integration is weak
- There is high-level support for the scientific community by politicians, but this is mostly superficial in some countries and absent in others[6]. For example, only Ghana and Nigeria have a domesticated science and technology plan, while the other countries have adopted the framework provided by the African Union (AU) and the Economic Community of West African States (ECOWAS) as the major policy guide
- Political instability experienced in countries like Liberia, Ivory Coast, Sierra Leone, The Gambia, and Mali has led to a lack of continuity in adopted methods for science advice from one administration to the next
- Past disease outbreaks in West Africa such as the 2014 Ebola Virus Disease (EVD), and the ongoing COVID-19 outbreaks have seen the formation of adhoc national or sub national committees of experts as the channels for science advice for the policy response; solely or in combination with existing bodies such as the science academies

Structures for Science Advice in West Africa

- The sub-region currently has 7 national science academies: Ghana Academy of Arts and Sciences (GAAS); Nigerian Academy of Science (NAS); Academie des Sciences et Techniques du Senegal (ANSTS); Académie

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[4] OECD (2018), Scientific Advice During Crises: Facilitating Transnational Co-operation and Exchange of Information, OECD Publishing, Paris. https://doi.org/10.1787/9789264304413-en

[5] Gluckman P and Gillespie A. WHO reform: a call for an early warning protocol for infectious diseases. 2020 Retrieved from https://theconversation.com/who-reform-a-call-for-an-early-warning-protocol-for-infectious-diseases-148078

[6] Jorson F. West African countries have a science and technology plan but it's going nowhere. Retrieved from https://theconversation.com/west-african-states-have-a-science-and-technology-plan-but-its-going-nowhere-121273. 2019

Nationale des Sciences, Arts et Lettres du Benin (ANSALB); Académie Nationale des Sciences Arts et Lettres du Burkina (ANSAL-BF); Académie des Sciences, des arts, des Cultures d'Afrique et des Diasporas Africaines (ASCAD), and Académie Nationale Des Sciences, Arts Et Lettres Du Togo (ANSALT). Typically, academies of science are independent organizations committed to advancing science and evidence in policymaking

- West Africa has a number of young academies: Academy of Young Scientists in Benin (AJSB), Cameroon Academy of Young Scientists (CAYS), Ghana Young Academy (GhYA), Nigerian Young Academy (NYA), and Académie Nationale des Jeunes Scientifiques du Sénégal (ANJSS)[7]
- Other non-academy advisers in the sub-region that provide policy advice on science-related matters are advisory bodies and think tanks such as the West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL), Consortium Pour La Recherche Economique Et Sociale (CRES), Institute of Statistical, Social and Economic Research (ISSER), the Nigerian Economic Summit Group (NESG), ECOWAS's West African Health Organisation (WAHO)
- The position of the Chief Scientific Advisor (CSA) is largely missing in Africa[8]. The CSA is an individual scientist whose role is to ensure that science underpins every government policy decision. The CSA serves as an intermediary between scientific committees and decision-makers, and mediates contests between science and policy. The main advantage of the position of a CSA is that advice can be timely, relevant, and in line with the policy process[9]

Science Advice in Emergencies Situations: Case Studies

Lessons from the 2014 EVD Outbreak in Lagos, Nigeria

EVD emerged first in December 2013 in West Africa, and in Lagos State, Nigeria in August 2014. In total, there were 20 recorded cases and 8 deaths in Nigeria, and the country was certified Ebola- free in October 2014. The outbreak was unpredicted, and there was very limited scientific knowledge.

At the onset of the outbreak in Nigeria, a multisectoral emergency preparedness committee was set up which included scientists. An Incident-Management (I-M) approach was adopted, using the WHO protocols governing the management of the disease. The Ebola Emergency Operations Centre, core strategic planning and decision-making teams, as well as response teams were also established. The response teams included surveillance, case management, infection prevention and control, laboratory, point of entry, social mobilization, as well as management and coordination. There was need for capacity building in the sciences (clinical and laboratory), disease surveillance, data management, emergency response, communications, advocacy, logistics management, governance and ethics. The team relied on historical evidence; experiences and practices of partner countries; and available scientific information from experts. The success in containing EVD was largely due to integrating evidence into decision making.

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7 Global Young Academy. National Young Academies. Available at https://globalyoungacademy.net/national-young-academies/

8 Diallo M. 2020. Contributing to a better understanding of science advice in Africa. Available at https: //www.ingsa.org/ingsa-news/diallo-sciadvice/

9 Wilsdon, James. (2014). The Past, Present and Future of the Chief Scientific Advisor. European Journal of Risk Regulation. 2014. 293-299. 10.1017/S1867299X00003809

Lessons from COVID-19: Nigeria's MEACoC

In order to enhance leadership and governance of Nigeria's Federal Ministry of Health (FMOH) response to COVID-19, the FMOH established a Ministerial Expert Committee of the Health Sector for COVID-19 Response (MEACoC). The MEACoC was set-up by the Honourable Minister of Health (HMH) to directly advise him on the best ways and means to control COVID-19 in Nigeria using sound scientific evidence. The MEACoC is multidisciplinary and functions to ensure that there is evidence-based decision making that will be used to efficiently, effectively and equitably eliminate the threat of COVID-19 in a timely manner in Nigeria. Terms of reference (TOR) were given to the MEACoC by the HMH in order to guide its work. It was hoped that the evidence and information collected, collated, and distilled by the Committee would be invaluable in coordinating the response, and especially in helping the Minister to better inform and guide the Presidential Task Force (PTF).

The MEACoC membership is divided into sub-committees to focus on priority areas and generate recommendations for consideration by the entire committee, and thereafter send them to the HMH for necessary actions to be taken. The MEACoC participates in the FMOH's situation room on COVID-19, so as to get firsthand information on the situation in the country. It also made contributions to Nigeria's pandemic and COVID-19 response plan. There are also sub-committees: epidemiology/surveillance; laboratory and testing; logistics and health technology assessment; clinical management (treatment); research and clinical trials; mitigation, social, and health economic implication; continuation of other health care/system strengthening; as well as risk communication and community engagement.

The MEACoC sent 3 sets of more than 200 recommendations cumulatively to the HMH and FMOH that cover all aspects of COVID-19 response and health system strengthening. The recommendations were all evidence-based and were deliberated and interrogated upon by the various sub-committees and by the whole MEACoC before they were accepted as MEACoC recommendations, and presented to the Minister. The FMOH initially appeared to be slow in taking action on the recommendations and at times the Committee was even unsure on the status of the implementation of its recommendations. However, in order to bridge the gap between the recommendations and their implementation, MEACoC set up a monitoring and evaluation (M&E) sub-committee that will track the implementation of the recommendations, and also help to advocate for the implementation of its recommendations. The setting up of the M&E sub-committee helped to bridge the gap in knowledge about the status of implementation of MEACoC recommendations, and also helped in the implementation of some. Additionally, MEACoC periodically (3 times now) presents a chart to the HMH and top management of the FMOH to show the level of implementation of its various recommendations.

Lessons from COVID-19: Benin's CNLS-TP

In the Benin Republic, there is an existing system set up by the government to manage outbreaks when they occur; Conseil National de Lutte contre le VIH/Sida, la Tuberculose, le Paludisme, les Infections Sexuellement Transmissibles et les Épidémies (CNLS-TP). This body is responsible for advising the government during outbreaks, and developing strategic epidemic outbreak plans. The Board consists of a President; the Minister of Planning and Development, and the Minister of Health as vice-presidents; several commission heads; and an Executive Secretary who coordinates the commissions.

At the start of the COVID-19 pandemic, CNLS-TP developed an operational plan and management flow chart made up of a decision centre and an operations centre linked by a communication and coordination unit. The operations centre functions through eight units: risk communication and community mobilization, epidemiology and surveillance, entry points, laboratories, infection prevention and control, therapeutic and clinical care, operation and logistical support, and systems resilience.

In addition to this existing system, the Minister of Health set up a scientific committee to help in decision making and crisis management. Similarly, the Minister of Higher Education and Scientific Research set up a committee of experts (ComExpert) to advice the minister on actions to be taken and scientific opinions on crisis management operations. While the plan is to make these structures permanent, the lack of permanent scientific advisors has led to hesitancy in taking actions by decision makers.

These case studies illustrate the lack of a statutory and effective science advisory mechanism, and a reliance on temporary and adhoc expert committees set up during emergencies and outbreaks.

Recommendations for Strengthening Science Advice in Emergency Situations in West Africa

1. **Promote coordination, partnerships, and collaboration:** There is need for coordinated observatories by ministries of health, academies of science, the West African Health Organization (WAHO), WHO, and non-governmental organizations in the sub-region. Partnerships will provide opportunities for resource sharing and learning across countries in the West African sub-region. Active collaboration is required to continually monitor data, track research findings, share information, and enhance partnerships to better use science in health emergencies and on a permanent basis. Transparency will also be required to develop such effective partnerships/ collaborations.
2. **Institutionalize mechanisms for science advice**: Channels for science advice, including experts, academies, and advisory bodies, should be integrated into decision-making centres to promote scientific input

during public health emergencies. The existing policy cycles should be re-examined to determine appropriate points for integrating science advice into the process of policymaking. There is also a need to ensure the training and retraining of policymakers and scientists on science advice.

3. **Enable quality science and evidence:** Science/evidence for policymaking needs to be sound, defensible, and as accurate as possible. There has to be integrity and transparency in the findings and the scientific processes adopted, as scientists strive for improvement and the development of good science. Capacity building for scientists is necessary in clinical and non-clinical skills, research, emergency response, communications, advocacy, governance, and ethics. Scientists also have to be honest in admitting the limitations of their research. Better and improved funding of research institutions and scientific committees will encourage such opportunities.
4. **Prepare for future emergencies:** There is the need to develop approaches to better position the sub-region for health emergencies yet to come. This can be done by drawing lessons from past and current outbreaks and pandemics, as well as evaluate actions that amplified desired and undesired outcomes. Questions must be asked and current strategies modified for greater effectiveness in a future emergency. After the 2014 EVD outbreak in Nigeria, NAS organized a workshop to document the events that led to the containment of the disease in Nigeria. This meeting, which brought together policymakers, scientists, and healthcare professionals- at the forefront of the response, served as an avenue to discuss critical factors responsible for Nigeria's successful control of EVD. Lessons learnt from the response to the outbreak, and strategies for strengthening the country's capacity in the prevention and response to infectious disease outbreaks were also discussed. Discussions at this meeting helped identify critical success factors from various aspects of the country's response, including hospital management, policy, as well as community mobilization and communication. Additionally, NAS has organized national and sub-regional workshops aimed at strengthening the full implementation of the Integrated Disease Surveillance and Response (IDSR), a tool that has been adopted by most African countries for responding and preparing for disease outbreaks.
5. **Reevaluate messaging, messengers, and communication**: It is important to recognize that the messenger and communication methods are as vital, if not more, as the message. The message must be clear, simple, and useable, while retaining the accuracy of the science. Additionally, scientists and science advisors should be honest about what is known and what is still uncertain. This would be helpful in fostering trust on the part of other stakeholders including the public.

There are different ways to get information to decision makers; including traditional and nontraditional channels. All messengers are important, as they have their specific audience with whom they have established credibility. For example, in the current Nigerian response to

COVID-19, the Nigeria Centre for Disease Control (NCDC) has utilized varied messengers in communicating with stakeholders, some of which are the Presidential Task Force (PTF) on COVID-19, state governors, the Association of Public Health Physicians of Nigeria (APHPN); while also coordinating media engagement almost on a daily basis.

The role played by religious and cultural leaders in conveying good information that can protect people now and in the future, as well as coalitions of new types of messengers could be part of a strategy to build partnerships amongst relevant stakeholders to better use science in health emergencies.

About the Nigerian Academy of Science

The Nigerian Academy of Science (NAS) is the foremost independent scientific body in Nigeria which was established in 1977, and incorporated in 1986. The NAS is uniquely positioned to bring scientific knowledge to bear on the policies/strategic direction of the country and is also dedicated to the development and advancement of science, technology, innovation (STI) in Nigeria. The aims and objectives of the Academy are to promote the growth, acquisition, and dissemination of scientific knowledge, and to facilitate its use in solving problems of national interest. The Academy strives to do this by:

- Providing advice on specific problems of scientific or technological nature, presented to it by the government and its agencies, as well as private organizations
- Bringing to the attention of the government and its agencies, problems of national interest that science and technology can help solve
- Establishing and maintaining the highest standards of scientific endeavours and achievements in Nigeria, through the publication of journals; organization of conferences, seminars, workshops, and symposia; recognition of outstanding contributions to science in Nigeria; and the development of a working relationship with other national and international scientific bodies and academies

As with national academies in other countries, NAS is a not-for-profit organization with a total membership (since inception) comprising 259 Fellows (who have distinguished themselves in their fields both locally and internationally), elected through a highly competitive process. Some of her members have served as vice-chancellors of universities, directors-general of government parastatals, and ministers in federal ministries. The Academy, given its clout, also has the ability to attract other experts from around the country and internationally when needed. NAS is Nigeria's national representative on such bodies as the International Science Council (ISC) – the umbrella body for all science associations and unions- and the Inter-Academy Partnership (IAP) – the umbrella body for all national science academies globally. The Academy is a member of the eexecutive committees of IAP Science and IAP Health, as well as a member of the Network of African Science Academies (NASAC).

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