

Advancing Global Response to Antimicrobial Resistance: Examining Current Global Initiatives

By Mirza Alas*

I. Introduction

Bacteria, fungi, and viruses rapidly develop resistance to our treatments to tackle infections. The ability of microorganisms to develop resistance and to survive is called antimicrobial resistance (AMR). The increase in AMR is threatening many modern medical advances that rely on antibiotics, antifungals, and antivirals to cure infectious diseases. Because microorganisms do

not respect borders, actions to control and slow down the spread of AMR need to include a global response and consider the needs and challenges of developing countries. AMR has been recognized as a worldwide health threat, and it was because of that international recognition that in 2015 the Member States of the World Health Organization (WHO) approved a Global Action Plan on AMR with five key objectives. The objectives of the plan are:1

Abstract

Antimicrobial resistance (AMR) is a severe ongoing crisis threatening our health systems. Since adopting the WHO Global Action Plan on AMR in 2015, there has been progress, particularly in improving awareness, surveillance and implementation of infection, prevention, and control measures. However, there has been a slower response related to optimizing the use of antimicrobials in the animal sector and actions related to the environment. Unfortunately, the COVID-19 pandemic has also undermined the implementation of activities to address AMR, including shifting resources to other areas and deprioritizing responses to AMR due to the ongoing pandemic. While national-level actions are at the core of the AMR response, given its global nature and impact, there is broad recognition of the need to ensure that national efforts are complemented with measures at the global level. Examining global initiatives to address AMR and how they can be strengthened to accelerate action is critical to better understand the importance of global coordination and increasing investment to close the gaps that remain.

La resistencia a los antimicrobianos (RAM) es una grave crisis actual que amenaza nuestros sistemas de salud. Desde la adopción del Plan de Acción Mundial de la OMS sobre la RAM en 2015, se han producido avances, en particular en la mejora de la concienciación, la vigilancia y la aplicación de medidas de infección, prevención y control. Sin embargo, ha habido una respuesta más lenta relacionada con la optimización del uso de antimicrobianos en el sector animal y las acciones relacionadas con el medio ambiente. Desafortunadamente, la pandemia de COVID-19 también ha perjudicado la ejecución de actividades para abordar la RAM, incluyendo el desplazamiento de recursos a otras áreas y la desprotección de las respuestas a la RAM debido a la pandemia. Aunque las acciones a nivel nacional son el núcleo de la respuesta a la RAM, dada su naturaleza e impacto global, existe un amplio reconocimiento de la necesidad de asegurar que los esfuerzos nacionales se complementen con medidas a nivel global. Examinar las iniciativas mundiales para hacer frente a la RAM y cómo pueden reforzarse para acelerar la acción es fundamental para comprender mejor la importancia de la coordinación mundial y el aumento de la inversión para colmar las lagunas que aún existen.

La résistance aux antimicrobiens (RAM) est une grave crise en cours qui menace nos systèmes de santé. Depuis l'adoption du plan d'action mondial de l'OMS sur la RAM en 2015, des progrès ont été réalisés, notamment en ce qui concerne l'amélioration de la sensibilisation, de la surveillance et de la mise en œuvre des mesures d'infection, de prévention et de contrôle. Cependant, la réponse a été plus lente en ce qui concerne l'optimisation de l'utilisation des antimicrobiens dans le secteur animal et les actions liées à l'environnement. Malheureusement, la pandémie de COVID-19 a également nui aux activités de mise en œuvre visant à lutter contre la RAM, notamment en déplaçant les ressources vers d'autres domaines et en privant les réponses à la RAM de leur priorité en raison de la pandémie. Bien que les actions au niveau national soient au cœur de la réponse à la RAM, étant donné sa nature et son impact mondiaux, il est largement reconnu que les efforts nationaux doivent être complétés par des mesures au niveau mondial. L'examen des initiatives mondiales visant à lutter contre la RAM et la façon dont elles peuvent être renforcées pour accélérer l'action sont essentiels pour mieux comprendre l'importance de la coordination mondiale et de l'augmentation des investissements pour combler les lacunes qui subsistent.

^{*} Mirza Alas is a Consultant with the Health, Intellectual Property and Biodiversity Programme of the South Centre.

- to improve awareness and understanding of antimicrobial resistance through effective communication, education, and training;
- to strengthen the knowledge and evidence base through surveillance and research;
- to reduce the incidence of infection through adequate sanitation, hygiene and infection prevention measures;
- to optimize the use of antimicrobial medicines in human and animal health; and
- to develop the economic case for sustainable investment that takes account of the needs of all countries and to increase investment in new medicines, diagnostic tools, vaccines and other interventions.

Since the approval of the Global Action Plan, many countries have designed their national action plans following the stated objectives and have started critical actions to contain AMR. There has been significant progress reported, particularly on improving awareness and understanding as envisioned by the first objective of the Global Action Plan. There have also been essential improvements in surveillance and implementing infection, prevention, and control measures. Some of

While national-level actions are at the core of AMR response, given its global nature and impact, there is broad recognition of the need to ensure that national efforts are complemented with measures at the global level. Therefore, examining global initiatives to address AMR and how they can contribute to accelerating action is critical to better understanding the importance of global coordination and efforts and the gaps that are still not addressed. Generating a better understanding of the ongoing global response to AMR can help examine it and perhaps provide opportunities to think about how the global response can best support national actions and provide a framework for all countries to respond to the complexity of AMR.

II. Global Governance on AMR

There have been many calls for a global response to AMR, particularly acknowledging that many of the issues that are needed for slowing down the emergence of AMR and conserving current treatments require the collaboration of many sectors. In 2015, an editorial from the WHO Bulletin noted that "solving the issues of access, conservation and innovation simultaneously will require new coordination and financing mechanisms, some of which must be organized globally". Moreover, "global standards are needed for surveillance, infection control, health-worker training, sales promotion, direct-to-consumer advertising

Figure 1 - Recommendation for the Establishment of a One Health Global Leaders Group on AMR¹²

Recommendation E2: The IACG recommends the urgent establishment of a One Health Global Leadership Group on Antimicrobial Resistance, supported by a Joint Secretariat managed by the Tripartite agencies (FAO, OIE and WHO), to:

- a. Maintain urgency, public support, political momentum and visibility of the antimicrobial resistance challenge on the global agenda;
- b. Advocate for action, including support for the expanding work of the Tripartite agencies (FAO, OIE and WHO), UN Environment and other international and regional entities;
- c. Monitor and report on progress, gaps and accountability in the global response to antimicrobial resistance;
- d. Advocate for multi-stakeholder engagement by facilitating a partnership platform with the participation of Member States, UN agencies, international and intergovernmental organisations and regional entities, civil society, the private sector, researchers and other key stakeholders to develop and work towards a shared global vision, goals and coordinated action on antimicrobial resistance;
- e. Provide advice and guidance on reports of the Independent Panel on Evidence for Action against Antimicrobial Resistance (recommendation E3):
- f. Monitor and advocate for the inclusion of antimicrobial resistance and a One Health "lens" in investments and programmes of major financing instruments for agriculture, health, development, food and feed production and other relevant areas (recommendation D1).

these achievements are documented in the self-assessment surveys carried out by the Tripartite organizations.² However, these assessments have also noted the slower response related to optimizing the use of antimicrobials in the animal sector and actions related to the environment.³ Unfortunately, the COVID-19 pandemic has also negatively affected implementing activities to address AMR, including shifting resources to other areas and deprioritizing responses to AMR due to the ongoing pandemic.⁴

and safeguards against incentives for overuse."⁶ At the time, the editorial had called for an international framework to address AMR; that aspiration was partly realized when in 2016, the United Nations (UN) held a High-level meeting and adopted the high-level political declaration of AMR through the UN General Assembly.⁷

Among the notable outcomes of the High-Level political declaration⁸ was the mandate to set up an Interagency Coordination Group (IACG), tasked with providing guidance and recommendations to the UN Secretary-General

(UNSG) on global action to address AMR. The IACG submitted its report to the UNSG in April 2019, and the UNSG urged countries to adopt the IACG recommendations, including the specific recommendations on global governance.

The IACG recommendations regarding global governance acknowledged that to promote an integrated One Health approach, a response by the Tripartite agencies (FAO, OIE, and WHO) together with United Nations Environment Programme (UNEP) would need to engage with other UN agencies as well as with financial institutions such as the World Bank. Furthermore, the recommendations on establishing a One Health Global Leaders Group and the Independent Panel on Evidence for Action against Antimicrobial Resistance aim to expand knowledge, gather expertise, and bring additional evidence to help draft recommendations to better respond to AMR.9

One of the recommendations made by the IACG is to strengthen accountability and global governance. The IACG recommended the establishment of a One Health Global Leadership Group on AMR and supported by the Tripartite agencies (WHO, FAO, and OIE).10 The UNSG subsequently also requested the Tripartite agencies to propose the terms of reference and the mechanisms for establishing the Global Leaders Group.¹¹ The UN IACG also recommended creating an Independent Panel on Evidence and a Multi-stakeholder Partnership Platform to help complement the work of the Global Leaders Group.

At present, these latter two governance mechanisms are still being developed. The Tripartite agencies have publicly discussed the critical elements of the proposed AMR Multi-Stakeholder Partnership Platform that closed on the 18 of September 2021 to collect views on the elements presented. A compiled report on the submissions to this consultation should be published in 2022.

The excerpt below from the IACG report outlines the functions of the Global Leaders Group.

III. The Global Leaders Group (GLG)

The Tripartite organizations announced the launching of the GLG during the World Antimicrobial Awareness Week in November 2020.13 The GLG aims to provide political leadership to respond to AMR and help advocate for actions to address AMR. The GLG has 20 members and is co-chaired by Prime Minister Sheikh Hasina Wazed of Bangladesh and Prime Minister Mia Mottley of Barbados. The Group has a broad membership, currently including ministers from Bhutan, Iraq, Sweden, Australia, Saudi Arabia, and Singapore, leaders from academia, the private sector, and civil society.14

During the first formal meeting of the GLG, key functions to guide their work were emphasized, such as maintaining the urgency, public support, and political momentum of AMR and its challenges to address them. The meeting also emphasized the need to continue to advocate for action and expand the work of the Tripartite organizations plus UNEP, and to "advocate for the inclusion of Antimicrobial Resistance and a One Health 'lens' in investments and programmes of major financing

Figure 2 - Co-Chairs of the Global Leaders Group



Bangladesh

Barbados

Co-Chairs, Global Leaders Group on Antimicrobial Resistance

Source: Antimicrobial Resistance_NEW2.indd (who.int)

instruments for agriculture, health, development, food and feed production."15 The point on advocating for financing refers to a critical area that has been highlighted multiple times as one of the main gaps in AMR response. Mobilization for funding has been recognized as a vital component

Figure 3 - GLG Priority Work Areas

Priority areas of work

- 1. Sustained political action on antimicrobial resistance by seizing critical opportunities.
- 2. Transformation of the human health, animal health, food, plant and environment eco-systems.
- 3. Improved surveillance and monitoring of antimicrobial use and resistance across all sectors.
- 4. Increased mobilization of internal and external financial resources, with a focus on low-and-middle income countries.
- 5. Increased innovations across all sectors to secure a sustainable pipeline for new antimicrobials, vaccines, diagnostics, waste management tools, and alternatives to antimicrobials.
- 6. Better understanding of environmental pathways to the development and transmission of antimicrobial resistance.

Source: https://www.amrleaders.org/about-us/what-we-do

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Figure 4 - Economic Costs of AMR from the World Bank

AMR could reduce GDP substantially—but unlike in the recent financial crisis, the damage could last longer and affect low-income countries the most

(annual costs as % of GDP)

FIGURE ES2. Economic Costs of AMR May Be as Severe as During the Financial Crisis

of AMR response. Still, this recognition has lacked appropriate commitments and much-needed global cooperation, notably to support developing countries in implementing national action plans. The task of the GLG in this area is difficult, but if successful can finally respond to the much-needed resources to adequately respond to AMR.

The GLG has also published information notes on

Percent of GDP (annual)

-2

-3

-5

critical areas AMR response. For example, on finance, the information note recognizes "[t]here is inadequate financial support currently available for the sustainimplementation of national action plans on antimicrobial resistance, particularly in lowand middle-income countries (LMICs). Increased investment is urgently needed to support countries to deliver on national action plans."16 This recognition is a vital startup point on the need to increase the attention for more

funding, particular-

ly now that countries' economies have been negatively affected by the COVID-19 pandemic. Recovery plans should include strengthening the capacity of health systems to deal with emergencies and other health threats such as AMR. On surveillance, their information notes stress how the lack of resources and continued reporting gaps across sectors make it difficult to ensure a One Health response to the AMR challenge. The note also emphasizes increasing investments and technical support for this area.¹⁷

In July 2021, the GLG published a more detailed work program with key performance indicators and priority areas that include efforts to increase advocacy to sustain political action and use opportunities arising from the COVID-19 pandemic response, to increase advocacy for integrating a One Health approach to the AMR response, increase infection prevention and control, and promote the responsible use of antimicrobials. Priorities also include advocating for improving surveillance and increasing and mobilizing financial resources.18

However, the GLG has been working without the other two governance structures meant to support its role, provide scientific advice (the Independent Panel on Evidence) and increase space for broader consultation, especially with civil society organizations (Multistakeholder Partnership Platform). The Antibiotic Resistance Coalition (ARC), in its submission to the public consultation on the terms of reference of the GLG in 2019, had pointed out concerning the Multi-stakeholder Partnership Platform, that this mechanism should be thought of as a "engagement platform that allows adequate consultation with public interest organizations and other rele-

> vant constituencies, with robust safeguards to protect against conflict of interest."19 Because these two structures have yet to be finalized, how the GLG would interact with these other structures will need to be defined later, even though the GLG has already commenced

The report on the GLG meeting of August 2021 noted that the COVID-19

its work.

pandemic has had dire economic consequences. This resulted in shifting attention from AMR to other areas in

"High-AMR" scenario, 2050 "Low-AMR" scenario, 2050 $^{-1.3}$ $_{-1.4}$ Country group: Low-income Lower middle-income Upper middle-income High-income

Source: World Bank Document

GDP growth fell during the 2008–2009 financial crisis,

compared to pre-crisis growth in 2001–2007

-1.7

particular pandemic response, which will be a challenge for increasing awareness to AMR. They requested the World Bank to update its 2017 annual cost estimate for antimicrobial resistance and estimate the loss to the global economy due to antimicrobial resistance. Updating this information could help countries better understand the economic consequences of AMR and provide more recent and accurate cost estimates and not only the projections.

In 2017, the World Bank²⁰ had already provided projections on the consequences of AMR on the global economy. The figure below from the 2017 World Bank report on AMR provides forecasts for 2050 on the economic cost of AMR. The request from the GLG could hopefully bring more attention to the economic impact that AMR will

The GLG report also noted that the GLG members would commission a paper to advocate for the inclusion of AMR in any new financing mechanisms that might be part of discussions on pandemic preparedness and response. However, AMR financing should focus on addressing the implementation of national action plans and ensure that critical areas are included, such as the environment that has seen less progress overall.

Page 4 POLICY BRIEF The purpose of the GLG is critical in trying to keep the AMR agenda high at the global level. It would be particularly crucial if it manages to promote the mobilization of the much-needed financial and technical resources for developing countries to implement national action plans to address AMR. However, the current setup of the GLG is not formally embedded in a governance process through a mechanism such as the World Health Assembly or the United Nations General Assembly; therefore, it is unclear how their work can be translated into further commitments and actions by other governments.

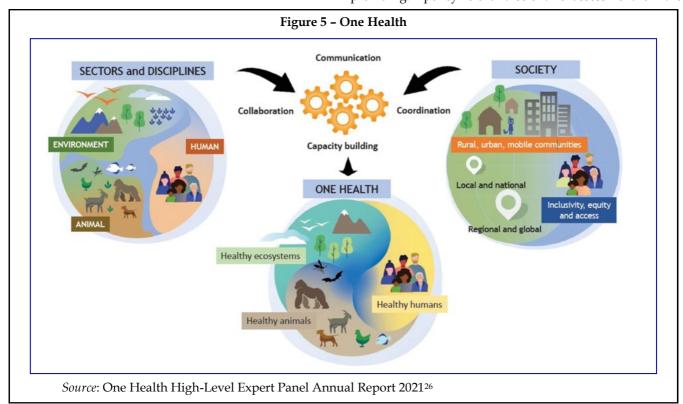
IV. Other Global Responses to AMR

Parallel to the work of the GLG, the adopted recommendations of the IACG by the UN General Assembly, and the ongoing work regarding the implementation of the WHO Global Action Plan on AMR, there have been other developments also aimed at keeping the attention on AMR high on the agenda. One of those initiatives came on 29 April 2021, when the United Nations held a High-Level Interactive Dialogue on Antimicrobial Resistance.21,22 and launched a Call to Action on Antimicrobial Resistance.23 The Interactive Dialogue and the Call for Action is another global initiative aiming to increase attention and global leadership to the complex issue of AMR, recognizing that national actions alone are not enough to stop the spread of resistant bacteria across the world. The document presented at the event and signed by 113 Member States with 35 supporting support of the One Health Global Leaders Group on AMR. The document also asks for work towards sufficient and sustainable funding for AMR, including COVID-19 recovery plans.

However, unlike the WHO Global Action Plan on AMR adopted by the World Health Assembly in 2015 and therefore endorsed by all the WHO Member states and the UN High-level political declaration adopted in 2016, the "Call to Action" is a show of commitment. Its main contribution is to continue highlighting the importance of AMR even if it cannot leverage global action.

At the same time, many international agencies have been working on setting up formal global collaboration arrangements to increase their expertise, and responses and increasing collaboration across animal, agriculture, health, and environment sectors particularly to intensify efforts that aim for a better "One Health" response to health issues. One Health efforts have been seen as a critical area in addressing AMR given the interaction between the human, animal, and environmental sectors in the transmission of resistant genes and how each sector contributes to exacerbating AMR.²⁴ Even though some of these collaborations focus on assessing One Health responses beyond AMR, particularly assessing the risk of zoonotic pandemics, it is also the hope that AMR will be part of their work.

For example, the One Health High-Level Expert Panel (OHHLEP) was launched in May 2021, and is composed of 26 international experts. The OHHLEP will be focusing on providing: "policy-relevant scientific assessment on the



organizations called for supporting the effective implementation of the recommendations of the Inter-Agency Coordination Group on AMR (IACG) and for the

emergence of health crises arising from the human-animalecosystem interface; and guidance on the development of a long-term strategic approach to reducing the risk of zoonotic pandemics, with an associated monitoring and early

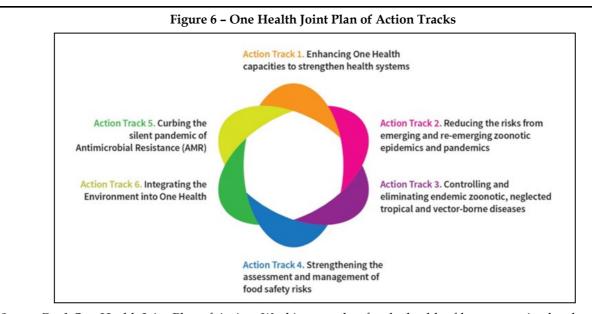
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warning framework, and synergies needed to institutionalize and implement the One Health approach, including in areas that drive pandemic risk."²⁵ This panel will provide the four partner agencies, FAO, OIE, UNEP, and WHO, with guidance, evidence, and inputs on One Health. This will be particularly key in the AMR area to help assess potential risks and also to help increase collaboration across sectors. The OHHLEP will play an advisory role to the international agencies and is expected to support their provision of

Plan of Action,²⁹ identifying six priorities. One of those priorities will be "curbing the silent pandemic of antimicrobial resistance (AMR) and better integrating the environment into the One Health approach."

The draft plan has just finalized the call for consultations with Member States and should be completed in 2022.

Increasing collaboration to provide a better One Health response with these global initiatives is a welcome sight.



Source: Draft One Health Joint Plan of Action: Working together for the health of humans, animals, plants and the environment, March 2022.³⁰

evidence-based scientific and policy advice to address the challenges raised by One Health. The group has recently launched a report containing a definition of One Health supported by WHO, UNEP, OIE, and FAO to help develop a common language and understanding of One Health.

Another example of the ongoing work across international agencies is the recently announced "Memorandum of Understanding" between UNEP and the Tripartite agencies (FAO, WHO, and OIE) to formally include the environmental agency in AMR work. The Tripartite agencies have been at the forefront of the global response of AMR, but UNEP was not formally part of their coordination. With this announcement, the agencies will be officially known as the "Quadripartite." and this should encourage expanding the work on AMR and the environment, which is an area that needs increasing attention and guidelines, mainly to help developing countries build expertise and infrastructure to address the environmental aspect of AMR.

The new Quadripartite has now developed a Strategic Framework for Collaboration on Antimicrobial Resistance²⁸ to support the pillars of the WHO Global Action Plan on AMR. Furthermore, the Quadripartite organizations are also working on a One Health Joint

However, it would be essential that there is good communication across the different initiatives to ensure that there is streamlining of work and that it can be presented to Member States through the governance structures of the other agencies to ensure that Member States can endorse adequate actions.

V. Conclusions

AMR is threatening the global ability to continue providing care for humans, animals, and plants. The core actions must be taken at the national level, as these responses should be adapted to the needs and circumstances of individual countries. But national efforts, particularly those in developing countries, need to be complemented with measures and support at the global level.

The WHO Global Action Plan on AMR continues to be an essential road map for countries to develop their national action plans and the UN High-Level Political Declaration of AMR in 2016 expanded the commitment calling for the mobilization of funding as well as for the integration of other global aspects such as research and development of new antibiotics. The UN Declaration also provided space for the work of the IACG that suggested critical areas where AMR work must be expanded. The work of the Global Leaders Group in this respect is particularly relevant and it would need to be supported by the other

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structures that had been recommended but are yet to be set up. Critically, the Independent Panel on Evidence whose aim is to provide scientific advice; and the Multi-stakeholder Partnership Platform for increasing space for broader consultation, especially with civil society organizations, keeping in mind the potential vested interest of non-state actors and work on safeguards must be set up.

Additionally, coordination among the different initiatives and their respective roles would also be needed mainly with the initiatives on increasing One Health response that go beyond AMR but that have strong linkages with the AMR response. Likewise, the recommendations coming from the different initiatives would need to be embedded into more formal global governance structures to ensure the broader adoption by countries. Recommendations regarding the mobilization of financing continue to be critical. Implementation of actions can only happen if international resources are mobilized. There is a recognition that some "countries have a greater differentiated responsibility to contribute resources to this common pool than others."31 This means that there is a clear recognition that developing countries will need technical and financial support to adequately address AMR.

Furthermore, the work of the Quadripartite will be critical in coordinating response across the different sectors for a truly One Health response to AMR and integrating the recommendations of the OHHLEP will also be necessary so that work is not fragmented but better coordinated.

Endnotes:

- ¹ WHO Global Action Plan and the five objectives can be accessed here https://www.who.int/publications/i/item/9789241509763.
- ² The Tripartite organizations refer to the World Health Organization (WHO), the Food and Agriculture Organization of the United Nations (FAO), and the World Organisation for Animal Health (OIE).
- ³ Report on the monitoring of global progress can be found here http://apps.who.int/iris/bitstream/handle/10665/273128/9789241514422-eng.pdf?ua=1.
- ⁴ See for example
- https://academic.oup.com/trstmh/article/115/10/1122/6195536 ?login=true.
- ⁵ The full editorial can be accessed here <u>Bulletin of the World</u> <u>Health Organization (who.int)</u>.
- ⁶ Bulletin of the World Health Organization (who.int).
- ⁷ See V. Muñoz Tellez, <u>PB45_The-Value-Added-of-the-United-Nations-General-Assembly-High-Level-Political-Declaration-on-Antimicrobial-Resistance_EN.pdf (southcentre.int)</u>.
- ⁸ UN High-level political declaration can be found here https://digitallibrary.un.org/record/842813?ln=en.
- https://www.who.int/antimicrobial-resistance/interagency-coordination-group/IACG_final_summary_EN.pdf?ua=1.

- ¹⁰ IACG final report https://www.who.int/antimicrobial-resistance/interagency-coordination-group/IACG final summary EN.pdf?ua=1.
- ¹¹ One Health Global Leaders Group on Antimicrobial Resistance (who.int).
- ¹² IACG report https://www.who.int/antimicrobial-resistance/interagency-coordination-group/IACG final summary EN.pdf?ua=1.
- ¹³ World leaders join forces to fight the accelerating crisis of antimicrobial resistance (who. int).

AMR News: Global Leaders Group on Antimicrobial Resistance announced during World Antimicrobial Awareness Week (campaignarchive.com).

- 14 A full list of GLG members can be found here $\underline{\text{One Health Global}}$ $\underline{\text{Leaders Group on Antimicrobial Resistance (who.int)}}.$
- ¹⁵ CL 165/INF/4 WA2 Establishment of the Global Leaders Group (GLG) on Antimicrobial Resistance (AMR) by the FAO/WHO/OIE Tripartite.
- 16 financing-to-address-amr.pdf (who.int).
- ¹⁷ surveillance-of-antimicrobial-resistance-and-use-.pdf (who.int).
- ¹⁸ Their full plan can be found here <u>glg-action-plan-July-2021_final.pdf</u> (who.int).
- ¹⁹ Full submission from the Antibiotic Resistance Coalition members is available from
- $\label{lem:https://static1.squarespace.com/static/5c3784843c3a534eadd60de4/t/5dc6eee4a14d2e0d1db07e16/1573318372779/FINAL ARC+Feedback+on+GLG+ToR+-+9+Nov+2019.pdf.$
- ²⁰ Full report from World Bank is available from World Bank Document.
- 21 Information on High-level Interactive Dialogue on AMR is available from $\underline{\text{https://www.who.int/news/item/30-07-2021-call-to-action-on-antimicrobial-resistance-2021}.$
- ²² See South Centre report on the High-level Interactive Dialogue on AMR https://us5.campaign-archive.com/?u=fa9cf38799136b5660f367ba6&id=299c3d9635.
- ²³ The full Call to Action document is available from https://www.un.org/pga/75/wp-content/uploads/sites/100/2021/04/Call-to-Action-on-Antimicrobial-Resistance-AMR-2021.pdf.
- ²⁴ See more information on the One Health interactions regarding AMR here https://www.southcentre.int/research-paper-104-march-2020/#more-13730.
- ²⁵ Information on the panel can be found here https://www.who.int/groups/one-health-high-level-expert-panel/ and here https://www.who.int/groups/one-health-high-level-expert-panel/meetings-and-working-groups.
- ²⁶ The full report is available from https://www.who.int/groups/one-health-high-level-expert-panel.
- ²⁷ Announcement of UNEP joining the Tripartite can be found here https://www.who.int/news/item/18-03-2022-un-environment-programme-joins-alliance-to-implement-one-health-approach.
- 28 https://www.who.int/publications/i/item/9789240045408.
- ²⁹ See the draft plan here https://www.oie.int/en/document/one-health-joint-plan-of-action-2022-2026-working-together-for-the-health-of-humans-animals-8-plants-and-the-environment/.
- ³⁰ https://www.oie.int/en/document/one-health-joint-plan-of-action-2022-2026-working-together-for-the-health-of-humans-animals-8-plants-and-the-environment/.
- ³¹ Setting the standard: multidisciplinary hallmarks for structural, equitable and tracked antibiotic policy | BMJ Global Health.

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The South Centre
International Environment House 2
Chemin de Balexert 7-9
PO Box 228, 1211 Geneva 19
Switzerland
Tel.: +41 22 791 8050
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