



المؤتمر الوزاري الثالث  
لمقاومة مضادات الميكروبات  
Third Global High-Level Ministerial  
Conference on Antimicrobial Resistance  
**24 - 25 Nov. Muscat - Oman**



Report Of

**THE THIRD  
HIGH-LEVEL  
MINISTERIAL  
CONFERENCE**  
On Antimicrobial Resistance

In Collaboration With







In Collaboration With



Food and Agriculture  
Organization of the  
United Nations



World Health  
Organization



World Organisation  
for Animal Health  
Founded as OIE

مجلس الصحة  
للدول مجلس التعاون  
Gulf Health Council



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## Table of Abbreviations

<b>AI</b>	Artificial intelligence
<b>AMR</b>	Antimicrobial resistance
<b>AMU</b>	Antimicrobial use
<b>EMR</b>	Eastern Mediterranean Region
<b>FAO</b>	Food and Agriculture Organization
<b>GDP</b>	Gross domestic product
<b>GLASS</b>	Global Antimicrobial Resistance and Use Surveillance System
<b>GLG</b>	Global Leaders Group
<b>HE</b>	His/Her Excellency
<b>IPC</b>	Infection prevention and control
<b>NAPHS</b>	National Action Plan for Health Security
<b>SDGs</b>	Sustainable Development Goals
<b>UN</b>	United Nations
<b>UNEP</b>	United Nations Environment Programme
<b>UNGA</b>	United Nations General Assembly
<b>WOAH</b>	World Organisation for Animal Health

# 1 EXECUTIVE SUMMARY

The Sultanate of Oman organized and hosted the Third High-level Ministerial Conference on Antimicrobial Resistance (AMR) in Muscat on 24 and 25 November 2022 to accelerate tackling AMR and enhancing international cooperation. The focus of discussions at this global event were political leadership at the country, regional and global levels in response to the growing threat of AMR and the role of the One Health approach in the response.

The conference was inaugurated under His Highness Sayyid Taimur bin Asa'ad bin Tariq Al Said, the Chairman of the Board of Governors of the Central Bank of Oman. The conference was organized collectively by the Sultanate of Oman government represented by the high-level supervising committee chaired by HE Dr Hilal Al Sabti, Minister of Health, and co-chair Dr Saoud Al-Habsi, the Minister of Agriculture Fisheries and Water Resources. The scientific, technical and logistic aspects of the meeting were in preparation for over a year by a national committee from the Ministry of Health and Ministry of Agriculture Fisheries and Water Resources in collaboration with the Quadripartite organizations (WHO, World Organisation for Animal Health (WOAH), Food and Agriculture Organization (FAO), United Nations Environment Programme (UNEP)), and the Gulf Health Council.

High-level participation from 44 countries, government ministers and officials included ministers of health, agriculture, animal health and the environment, as well as the director generals of the Quadripartite organizations and the regional director of the Eastern Mediterranean Regional Office (EMRO) for health made up the attendees of the conference. The meeting was also attended by representatives of international organizations, policymakers, key global experts and representatives from the private sector, civil society, research institutions and multilateral organizations. The conference was conducted through keynote speeches, case studies demonstrating best practices and interactive discussions between participants. The conference allowed an interactive dialogue on One Health action to address the AMR pandemic.

All the discussion and recommendations from this conference has been incorporated in the Muscat Ministerial Manifesto which included, for the first time, setting targets for the utilization of antimicrobials in the different sectors (agri-food, animal health and human health). The Manifesto includes the following targets:

1. Reducing the total amount of antimicrobials used in the agri-food system by at least 30-50% from the current level by 2030;
2. Zero use of medically important antimicrobials for human medicine in animals for non-veterinary medical purposes or in crop production and agri-food systems for non-phytosanitary purposes;
3. Ensuring that Access group antibiotics comprise at least 60% of overall human antibiotic consumption by 2030.

The Manifesto has been endorsed by 47 countries so far (see Annex). The Sultanate of Oman, in taking the Manifesto forward, will be expected to advocate for it with the international organizations to be included and endorsed globally in the 2024 United Nations General Assembly (UNGA) AMR meeting.

Access group antibiotics: a group of antibiotics in the 2019 WHO AWaRe Classification Database that react to a wide range of common pathogens but also have lower resistance potential than antibiotics in other groups. Access group is comprised of 48 antibiotics, 19 included on the WHO Model List of Essential Medicines as first- or second-choice empiric treatment options for specified infectious syndromes. (<https://www.who.int/news/item/01-10-2019-who-releases-the-2019-aware-classification-antibiotics>, Accessed 12 May 2023).

Intercountry consultation on the Muscat Manifesto on AMR occurred on 17 October 2022. (<https://amrconference2022.om/>, accessed 18 May 2023). The Muscat Ministerial Manifesto on AMR. 2022. (<https://amrconference2022.om/MuscatManifesto.html>, accessed 18 May 2023).



## 2 WELCOME SPEECH & OPENING REMARKS



### The welcome speech

was graciously given by HE Dr Hilal bin Ali Al Sabti, Minister of Health, Sultanate of Oman, who stressed the critical stage we are passing through globally

in terms of AMR. With the WHO having declared AMR one of the top 10 global public health threats facing humanity, HE Dr Hilal bin Ali Al Sabti insisted we, from the individual to the organizational level, must unite to address this threat with a One Health approach. He applauded Oman's work to date in making great strides to address AMR and the success of the two previous conferences held in the Kingdom of the Netherlands which this conference builds upon, stating the goals of this conference were to reinforce the importance of political commitment in applying the One Health approach to address AMR; sharing experiences in methods of implementing the approach in risk mitigation; and finding opportunities for collaboration and partnership between countries and international organizations to address antimicrobial resistance in the context of the Sustainable Development Goals (SDGs).

"A recent scientific study showed that antibiotic resistance caused an estimated 1.3 million deaths in 2019. Scientific predictions indicate that if no action is taken by 2050, antimicrobial resistance could kill up to 10 million people annually, drop annual GDP by 3.8%, and push up to 28 million people into poverty. The COVID-19 pandemic has exacerbated the phenomenon of antibiotic-resistant microbes and highlighted the importance of readiness and preparedness for outbreaks and pandemics, including activating prevention and infection control, raising the diagnostic efficiency of laboratories, and developing and activating policies around antibiotic-resistant microbes".

**HE Dr Hilal bin Ali Al Sabti,**  
Minister of Health, Sultanate of Oman



### HE Dr Saoud Al-Habsi,

Minister of Agriculture, Fisheries and Water Resources, Sultanate of Oman spoke of Oman's success in effectively and coherently integrating the

fields of agriculture, health and the environment within the framework of the "One Health" approach, through the national plan to combat antibiotic-resistant microbes and in the context of the SDGs. HE Dr Saoud Al-Habsi detailed the two ways Oman focused on preventing and combating the spread of antibiotic resistance, first, by going beyond the field of biosecurity and food safety to the scope of food quality and nutritious foods, the Sultanate has adopted policies to guarantee animal health and food safety and strengthen systems to urge the public to adopt and maintain healthy habits; second, by applying biosecurity measures - improving management and production systems, banning the use of certain antibiotics, and raising awareness to follow good practices in all stages of production and processing. Furthermore, HE underscored the importance of dealing with the global threat of AMR was in reaching a global partnership to implement international guidelines and develop appropriate national legislation.



# 2 WELCOME SPEECH & OPENING & REMARKS



## HE Dr Ernst Kuipers.

Minister of Health, Welfare and Sport, Kingdom of the Netherlands detailed the Netherlands' commitment, alongside global partners, to push back against AMR,

specifically, the first One Health Ministerial Conference on AMR in 2014 which paved the way for the AMR Global Action Plan of 2015 and the UN political resolution of 2016, and a second ministerial AMR conference in close collaboration with the Tripartite (FAO, OIE and WHO) in 2019. Even though much has been done since 2019, HE Dr Ernst Kuipers stressed that challenging times call for more to be done. Strong action is needed to combat the persisting problem of AMR: mobilizing health care, agriculture and the environment sectors, mobilizing not only governments, but the private sector, NGOs and the public, and counter AMR through international cooperation to turn ambition into action. HE stressed the importance of cooperation, quick response in health security and preparation, referencing the COVID-19 pandemic and the current negotiations on an international pandemic instrument, of which the Netherlands is co-chair together with South Africa. In closing, HE made a call to action to be ambitious and innovative, urging the attendees to show strong leadership to the rest of the world.

"The rise of antimicrobial resistance remains one of the biggest, complex and growing global public health threats of our time. Misuse and overuse of antimicrobials are the main drivers in the development of drug resistant pathogens. AMR threatens the effective prevention and treatment of an ever-increasing range of infections. It affects the health of millions of people. It affects livestock. It affects our food, our water and our economies. And therefore, AMR directly threatens the achievement of the Sustainable Development Goals".

**HE Dr Ernst Kuipers, Minister of Health,**  
Welfare and Sport, Kingdom of the Netherlands



## Dr Qu Dongyu.

Director-General, UN FAO detailed FAO's efforts to curb AMR. FAO has been adapting by reducing the need for antimicrobials on farms, and providing com-

prehensive support at the country and farmer level as the farmer is a major player in the solution. To leave no one behind, FAO is working on a transformation of their systems to make them more resilient and sustainable and accessible to all. The DG applauded the political commitment and urged all to maintain momentum for the upcoming 2024 UNGA high-level meetings and to take the opportunity to transform the Muscat Manifesto's ambition into concrete achievable AMR reduction targets.

"AMR is one of the top 10 global public health challenges causing approximately 1.3 million deaths every year. The impact of AMR heavily goes far beyond human health threatening animal health and the environment, food security and food safety, economic growth as well social well-being".

**Dr Qu Dongyu,**  
Director-General, UN FAO

## 2 WELCOME SPEECH & OPENING REMARKS



Emphatically, **Dr Tedros Adhanom Ghebreyesus**, Director-General, WHO, expressed the gravity of AMR, a phenomenon estimated to lead to five million deaths every year.

According to the Strategic Framework published by the Quadripartite organizations, sustainable funding still requires establishment to realize the essential and effective interventions needed. Dr Tedros conveyed his hopes that this meeting would well prepare for the political commitments needed for the 2024 UNGA high-level meeting on AMR and reiterated WHO'S commitment to support national One Health responses to AMR which need to be underpinned by policy, technical frameworks, and sufficient institutional capacity and resources.

"AMR is one of the most urgent and complex challenges of our time, and yet perhaps because it is not as dramatic as a pandemic, a war or a humanitarian emergency, it doesn't attract the same attention from governments, donors or the media. The scale of the problem - and its consequences - cannot be ignored".

**Dr Tedros Adhanom Ghebreyesus**,  
Director-General, WHO



**Monique Eloit**,  
Director-General, WOA, conveyed facts regarding antimicrobial use in animal husbandry - currently 1.3 billion people rely on live-stock for their livelihoods

and 20 million people depend on aquaculture; annually, 75 000 tonnes of antimicrobials are used globally for animals. WOA monitors this data and urges countries to perform more data surveillance to transform information into action through well-designed national action plans. DG Monique Eliot stressed the importance using antimicrobials responsibly only when other alternatives are inefficient or unusable and echoed other speakers' urgings that we all must work together with a One Health approach.

Antimicrobials will never replace proper animal care. We all know what the world would look like without antimicrobials; for this reason, we must act together and really act urgently to preserve this precious therapeutic arsenal. If we do not change our behaviours, if we do not work together and support all sectors and support them equitably, we will not stop this silent tsunami.

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**Monique Eloit**,  
Director-General, WOA

## 2 WELCOME SPEECH & OPENING REMARKS



### **Inger Andersen,**

Executive Director, UNEP, explained AMR as an interconnected issue, tied closely to environmental problems which are all driven by unsustainable human consumption and production. Therefore, a One Health approach is essential. UNEP is working on a spotlight report on the environmental dimension of AMR which he explains as a complex global problem requiring a coordinated multisectoral and multinational approach and radically improved governance and international standards. This would translate into reformed national regulations and engagement with industry actors and changes in practices within these industries.

“Antimicrobials have protected humans, animals and plants for a long time but for decades we’ve literally been flushing antibiotics down the drain. This goes into our waterways into the environment and into the foods that we eat, so this coupled with the overuse of antimicrobials works to reduce the effectiveness of antimicrobials themselves... and imagine a world in which the medicines we produce no longer are affected”.

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**Inger Andersen,**  
Executive Director, UNEP



**HE Dr Chris Fearne,** Deputy Prime Minister of Malta and Vice Chair of the Global Leaders Group on AMR calls to attention the reason why the public is not up in arms about AMR.

Despite having a staggering death toll, connected and directly with this problem, the public does not appreciate the depth and the severity of this of this silent pandemic. Though the data is reasonably available in humans and to a lesser extent, animals, there is little data on AMR in plants and practically no data on AMR in the environment. Without these figures, the extent of the problem is not definable, therefore the public are not aware, and AMR is not given the required resources and attention. Therefore, surveillance is key, not only in humans, but in animal, plant and environmental health. He stressed the importance of change coming from individuals and from country’s national action plans, and that the current meeting is extremely important because it lays a solid foundation for change.

“Make no mistake, a One Health approach is a political decision, it is a political process, and we need to tackle this politically”.

**HE Dr Chris Fearne,**  
Deputy Prime Minister of Malta and Vice Chair of the Global Leaders Group on AMR



Following **HE Dr. Saoud Al-Habsi's** speech, a short video highlighting the efforts of the Sultanate of Oman to address the threat of AMR was produced and played at the conference. It emphasized the different milestones achieved by the multisectoral collaboration to tackle the threat of AMR in Oman.

<https://www.youtube.com/watch?v=XbtbUxfg2Jk>



# 3

## Launch Of The Multi-Stakeholder **Partnership Platform On AMR By The Quadripartite Organizations**

The growing global threat of AMR in all countries mandated an urgent, coordinated, multisectoral, One Health approach in the context of the 2030 Agenda for Sustainable Development . Therefore, The Quadripartite has established an AMR Multi-Stakeholder Partnership Platform (AMR Platform) as one of the three global governance structures. The meeting witnessed the launch of the Multilateral Partnership Platform on AMR to motivate countries to take measures to address AMR with the aim of enhancing cooperation between a variety of stakeholders at all levels within the scope of One Health. The platform also seeks to ensure a healthier, more sustainable, and resilient present and future that provides universal access to antimicrobials as vital life-saving medicines.

A short video about MSP-PP was played followed by a speech by HE Qu Dongyu, Director-General of the UN FAO who gave an overview of the platform on behalf of the principals of the Quadripartite.

<https://www.fao.org/sustainable-development-goals/en/>

Accessed 22 May 2023.

## 4

First Ministerial Plenary Panel:

## The Hindsight, Insight And Foresight For The AMR

### 4.1 Introduction

Talking about the threat of AMR is a dialogue of hindsight, insight and foresight – together providing the foundation for planning and decision-making.

- Hindsight identifies what patterns we have seen in the past, how those evolved, and what lessons we can learn: We need that wisdom.
- Insight provides a clear-eyed analysis of the data at hand, enhanced by AI tools and exposes our cognitive biases: We need those facts.
- Foresight identifies what we should be doing today to prepare for an uncertain tomorrow: We need that imagination.

Combining these three—wisdom, facts and imagination—the first ministerial plenary session was designed to enable better decision-making and better outcomes for mobilizing the global, regional and national AMR and One Health response from policies to action era. It was divided into three panel sessions.



## 4.2 Panel 1 A: AMR And The Political Response

AMR is the biggest threat the world is facing in the control of infectious diseases. This phenomenon already affects the entire world. Further, the cost of inaction against AMR may culminate in a horrific post-antibiotic era. Therefore, strong political commitment at the highest level in all countries is a prerequisite and the key to success.

### Key questions

- Why is AMR not getting the political support at national, regional and global level?
- How Do you think the experience of COVID-19 enhances the political commitment to AMR?

### Moderator

**Dr Almotasem Al Mamari**

### Panellists

**HE Dr Jerome X Walcott**

Minister of Health (Barbados)

**HE Dr Khalid Abdel Ghaffar**

Minister of Health and Population  
(Egypt)

**HE Dr Bharati Pravin Pawar,**

Minister of State for the Health and  
Family Welfare (India)

**HE Dr Anton Refalo**

Minister for Agriculture, Fisheries,  
Food and Animal Rights (Malta)

**HE Dr Osagie Ehanire**

Minister of Health (Nigeria)

**Helena Semedo**

Deputy Director  
General of FAO

## Summary Of The Discussion

- There was consensus that there is a lack of national, regional and global political response. We are lagging and must make political commitments for the benefit of humankind. The pandemic highlights the need to focus on the urgency of AMR and response as One Health. AMR is a silent pandemic that needs visibility within the political agenda.
- At the national level, the ministers agreed that countries need to see AMR as an economic and health priority and need to educate and raise awareness among the public, especially regarding the effect on animals, food and the environment. The need for behavioural change is paramount. Panellists discussed looking into the area of antimicrobial utilization in public and private sectors; national political commitment to bring sectors together to develop an action plan as One Health approach and include all pillars of response plan to take further steps for One Health approach; and that countries need more collaboration with organizations. Panellists also emphasized the need to increase awareness about AMR, especially with the public, to change the pattern of irrational use of antimicrobials. AMR action plans should focus on:
  1. national coordination through centre of disease control
  2. Taking AwaRe classification for monitoring consumptions
  3. regulation of prescriptions
  4. surveillance and report to Global Antimicrobial Resistance and Use Surveillance System (GLASS)
  5. strategic review of infection prevention and control (IPC) to strengthen the health care system, including antimicrobial stewardship (AMS)
  6. strengthen biosecurity.
    - At the regional level, AMR surveillance and situation assessment is essential to drive national action plans, funds and enhance the role of G7 and G20.
- At the global level, enforce implementation of the national action plan, especially financing, in collaboration with UN agencies and Quadripartite. The indicators included for AMR within SDGs will help in the response. The panellists highlighted that having a political declaration puts countries on the right track, as is the case with the Muscat Manifesto. The momentum of this conference and the high-level meeting during the UNGA in 2024 should be utilized to bring political visibility for AMR. The following actions are needed:
  1. encouraging collective action as the way to reach solutions
  2. embarking into an action plan
  3. taking political roles to enforce implementation.





### 4.3 Panel 1B: Key Challenges For The Amr Response

AMR increases mortalities, the costs of our health care, damages trade and economies, and threatens health security, all of which call for an urgent response, so what are the challenges hindering this response?

#### Key question

- What are the two most challenges hindering the progress for the AMR response for the sector you are responsible for?

Moderator

**Dalia Issam Hammad**

Panellists

**HE Michalis Hadjipantela**

Minister of Health (Cyprus)

**HE Mohammed Kareem Al Khafaji**

Minister of Agriculture (Iraq)

**HE Dr Mohammed Issa Al Hayari**

Secretary-General of Agriculture  
(Jordan)

**HE Rwamirama Bright Kanyontore**

Minister of State for Agriculture  
(Uganda)

**HE Sarah Boateng**

Principal Deputy Assistant Secretary,  
Department of Health and Human  
Services (United States of America)

**HE Dr Monique Eloit**

Director-General, WOAHA

## Summary Of The Discussion

### The panellist discussed the following challenges that hinder AMR response:

- pharmaceutical: To be addressed collectively - it is not good for the business to reduce antibiotics
- no standard reporting for AMR - the availability of such reporting mechanisms will help in the solutions' advancement
- effective and strict management of overusing antibiotics are needed; awareness at a global scale
- poor behaviour and indiscriminate use of antibiotics
- the absence of pre-emptive vaccination campaigns
- lack of public and animal awareness and knowledge on AMR
- overusing antibiotics
- lack of legal commitments.

### The panellists agreed on the importance of:

- implementing a multisectoral national strategy
- developing a national surveillance system
- updating information
- precautionary approach through a national vaccination campaign for animals and humans (One Health approach)
- building capacities, mainly the medical
- community protection
- encouraging research.

### Finally, the panellist listed the following recommendations:

- increasing national and international collaboration
- prohibiting some medicine and antibiotics
- mandating veterinary technical guidelines
- promoting a national and international multisectoral approach
- applying vaccination as a preventive measure
- banning the use of non-biodegradable chemicals
- enhancing effective IPC
- needing to strengthen capacity-building
- aligning AMR efforts with other related efforts
- leveraging and networking with laboratories
- improving detection
- reducing the misuse of antibiotics
- improving processes on farms and hospitals
- implementing best practices
- acting collectively and collaboratively at a global level
- applying preventive measures as a priority
- equally and multisectoral actions/works
- encouraging public-private partnership
- supporting diagnostic challenges
- appointing designated people to advise on best practices (dedicated network)
- investing in sustainable development and natural resources protection.



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لجنة الوزارة العامة  
حول الابتكارات  
Ministerial Plenary  
Solutions & innov



#### 4.4 Panel 1C: Solutions And Innovations

Combating AMR requires sustained national efforts and worldwide collaboration to generate the resources needed to preserve the efficacy of antimicrobials and to create new diagnostic and therapeutic tools to protect the health of all people, as enshrined in the UN SDGs and articulated in paragraph 26 of the political declaration on these goals.

##### Key question

- What can be some of the solutions and innovations we need in order to preserve antimicrobials for humans, animals and plants?

Moderator

**Dr Almotasem Al Mamari**

Panellists

**HE Dr Mai Salem Al-Kailah**  
Minister of Health (Palestine)

**HE Dr Jakob Forssmed**  
Minister of Social Affairs (Sweden)

**HE Dr Haitham Mohammed Ibrahim**  
Minister of Health (Sudan)

**HE Dr Ali Al Mrabet**  
Minister of Health (Tunisia)

**HE Dr Ahmed Al-Mandhari**  
Regional Director EMRO/WHO

**Professor Dame Sally Davies**  
United Kingdom Special Envoy on  
AMR and member of Global Leaders  
Group on AMR (GLG)



## Summary Of The Discussion

### Panellists agreed that:

- AMR is a multifactorial multi-dimensional and very complex issue that needs a multi-set of interventions through a multisectoral approach. It was stated that, "we cannot move alone, we have to come together in facing this challenge" either at a national level, all sectors private and public, or at regional or international levels.
- It is crucial to have a national AMR surveillance and to improve the capacity of the laboratories as well as to develop a research plan regarding AMR both on having evidence based on the practices of the use of antibiotics. It was agreed that "no data means no response" and "if you cannot measure it you cannot manage it". Therefore, it is vital to have accessible, usable and interoperable data on antimicrobial consumption and resistance that is used to shape policy, shape interventions and to know where to invest. Hence, it is necessary to urge all countries to use WHO's surveillance system, GLASS, that has been developed and strengthened to engage countries in the reporting of data. Also, establish digital systems to facilitate monitoring.
- More global governance and commitment at the highest political level and accountability of actions at the country level are required.
- Resources must be allocated and budgeted to finance the national action plan for AMR.
- Regulations and policies with enablers to enforce these regulations and policies to be implemented on the ground, including rationalizing the use of optimal antimicrobials in animal and human health.

- IPC measures should be focussed on and should be implemented very well in the health care system. This needs to include a preventive perspective to increase patient safety by strengthening IPC by decreasing the number of infections and using antimicrobials.
- Vaccination is the main tool to counteract diseases. It is a weapon that we have to control infections.
- Use of antimicrobial medicine must be optimized through access to qualified antimicrobial drugs and to have rules and regulations.

### **Panellist called for innovations and solutions on a national level that used formalized One Health which would work within an intersectoral coordination mechanism. Necessary solutions included:**

- Building stewardship programme number four to promote research in innovation into AMR - a national long-term AMR research programme has been implemented and an international research cooperation through our engagement in the joint programming initiative on AMR is being promoted.
- Educating and training of human and animal health professional to the must include instruction on the monitoring of microbial resistance.
- Communicating effectively with the leaders - we need to reflect on the health impact and consequences of the AMR on Health in general. Moreover, a people-centred approach is needed by using behavioural insights to reach effective engagement.
- Calling on everyone especially donors and funders to increase the innovation in quality-assured new antimicrobials, particularly antibiotics.
- Increasing innovation in novel diagnostics which is another challenge that health systems are facing as well as other Industries and systems.
- Incentivizing pharmaceutical manufacturers to invest in innovation and research in the development of antibiotics.



## 5

## Parallel Sessions

The technical experts conducted four parallel sessions to discuss in detail the implementation of AMR action plans, integrated surveillance, political actions, financing, and research and development.



### 5.1 Parallel Session 1: Country Implementation

United political leadership taking the One Health approach at the national level is required for creating sustainable momentum in the implementation of national action plans. Leadership is shown by joint visibility, joint commitment to follow up on progress, and by ensuring balanced and sustainable funding of all sectors concerned. The panels discussed and made recommendations in the following areas:

- Sector-specific target setting as a means of creating focus and directionality has proven to be effective. This approach should be used not only with respect to use in humans and animals, but also in, for example, environmental discharge.
- The AMR silo should be avoided. Include AMR in broader agendas and strategies, such as pandemic preparedness and response (lessons learned from COVID-19), national SDGs and in national security plans.

- Multisectoral coordination mechanisms are instrumental, and need to operate at all levels, including the ministerial level. They should be institutionalized to ensure sustainability and continuity over time.
- Priority should be given to reducing the need for antimicrobials, by strengthening health systems across sectors to improve basic infection prevention and control, as well as sanitation and waste management.
- What is not measured cannot be managed. Access to data opens the door for innovation, e.g., for improving decisions in health systems through AI.
- Health workers should be empowered to act as ambassadors for change, e.g., by inclusion of AMR mitigation in academic curricula.
- Change agents are needed at all levels and in all sectors. Mechanisms should therefore be in place to involve a broad range of stakeholders in execution of National Action Plan for Health Security (NAPHS) (not limited to government).
- Behaviour and expectations related to antimicrobial use (AMU) must change. Efforts should be made to increase public awareness through effective communication, focusing on agency as well as urgency.
- Technical country-to-country support in the implementation of NAPs, for example by support through the AMR Multi-Partner Trust Fund, is effective and available. Such mechanisms should be championed and funded in a sustainable manner. Change takes time.
- Constraints to implementation need to be managed proactively as part of national action on AMR.

### Call to action

- Adopt an all-of-government approach to One Health and think broader than AMR.
- Ensure multisectoral coordination is institutionalized at all levels.
- Set ambitious targets, specific for each sector, for focus, concretion and directionality.
- Involve the private sector and civil society in target setting and execution of NAPs.
- Foster an empowering narrative to strengthen agency.
- Invest in stronger health systems, for all, as well as in improving sanitation.
- Invest in the health systems' workforce, as agents of change.
- Ensure funding of country-to-country support for NAP implementation, e.g., through the AMR Multi-Partner Trust Fund, is sustainable and long-term to allow for change continuity.





## 5.2 Parallel session 2: Integrated surveillance

AMR is no longer a silent pandemic but one with multidirectional reach across sectors. Integrated One Health surveillance is the “collaborative and continuous, planning systematic collection, analysis, interpretation and communication of AMR, AMU and relevant AMR-sensitive data essential for action, to optimize One Health policy and practice to mitigate AMR, and may be initiated at any relevant point depending on the need and resources”.

- Addressing AMR/AMU is complex - however, integrated surveillance offers a comprehensive and unified collaborative approach to understanding AMR trends and implementing effective interventions.
- Data for meaningful action, even simple integrated figures, can lead to effective interventions - information from integrated surveillance is powerful and can be translated into meaningful action and policies.
- Integrated surveillance is doable and requires a stepwise approach - consultation, collaboration, coordination, communication, capacity-building and compromise are essential. Integrated surveillance should be country and context specific:
- Countries are used to map and assess their capacities and capabilities for sectoral and national AMR surveillance.
- Laboratories remain the backbone of surveillance; diagnostic capacity in human, animal and environment intersectoral collaboration is required for integrated surveillance.
- AMR surveillance protocols should be adopted and standardized at sectoral, national, regional and global levels.

- Existing surveillance systems, e.g., tuberculosis, HIV and malaria (legislation, surveillance, laboratory and IPC infrastructure), and COVID-19 genomic systems should be leveraged upon and integrated.

## Recommendations

- High-level political advocacy at the higher level for multisectoral integrated AMR surveillance (G7, G20, UNGA).
- Global investments for integrated AMR surveillance through strengthened national public health institutions and other national systems and structures to implement integrated surveillance across the One Health spectrum.
- The vital role of national public health institutes in supporting national laboratory networks and coordination of integrated surveillance must be promoted.
- Domestic financing and sustainable investment for strengthening of infrastructure and capacity for sector-specific surveillance of AMR and AMU with stepwise progress to integrated surveillance should be sought.
- Legal and regulatory frameworks to strengthen AMR data sharing mechanisms across sectors, countries and regions, must be built on trust, and importantly, with no blame games being played.





### **5.3 Parallel session 3: Political actions and financing**

AMR cannot be addressed unless it comes from the collaborative, multi-sectoral, and transdisciplinary One Health approach. Increased challenges exist in securing political commitment from animal, plant and environmental sectors. As an important pillar for AMR politics and financing were discussed in this session. We spotlight here some examples of lessons learned from Thailand and Zimbabwe and follow up with a summary from the perspective of funding agencies and some insights from the agri-food business.

## THAILAND

- **Infrastructure:** Thailand highlights the importance of prioritization and adoption of a pragmatic approach - which is not unrealistically ambitious/optimistic - while forming AMR governance structures, setting up systems and targets.
- **Regulation:** The country has been able to regulate antibiotic use, meet/exceed targets and annually report about use.
- **Financing:** Thailand has set up a mechanism that, through a pooled funding, national agencies contribute up to 80%.
- **Challenges:** Creating public awareness, enhancing leadership, and widening stakeholder engagement in new areas such as environment and consumer protection.

## ZIMBABWE

- **Prevention:** Zimbabwe has been making vaccines locally, as an effective tool to replace antibiotic use. They produce a vaccine (BOLVAC) to avoid tetracycline use in the treatment of theileriosis. They also produce vaccines (Anaplasma and Babesia) to discourage farmers from using antibiotics in treating tick-borne diseases.
- **Financing:** Zimbabwe has made effective use of funds (Fleming Fund) in renovating and upgrading human/animal health/environment laboratories and training personnel.
- **Planning:** The country has revised their AMR NAP and governance structures to reflect One Health.
- **Politics:** Upgrading AMR governance structure to a One Health governance structure, which can be established in a higher office (e.g., Prime Minister's office).

## Perspective From Funders

### World Bank: Prevention Plus Monitoring Is Cost-Effective

- Prevention does not cost much. In terms of funding, it is small. The difficult part is that it needs coordination - within government and different sectors (e.g., health, education, environment).
- Prevention is required to reduce the risk of an outbreak, which can never be zero. But if correct, quick and transparent monitoring is done, it can reduce the damage caused by the outbreak. This must be undertaken by every country to avoid the kind of devastation COVID-19 brought. It is important to shift the paradigm towards prevention and monitoring.
- Return on investment with prevention is very high. Because of the interdependence between the health of people, animals and ecosystems; if we prevent AMR, we prevent pandemics. One Health is a global public good.
- The World Bank is committed to supporting low- and middle-income countries in the prevention part of the action plan. The WHO-World Bank Financial Intermediary Fund for prevention, preparedness and response can fund critical investments for low- and middle-income countries.
- The challenge of quantifying and surfacing the problem: Lack of One Health

### Fleming Fund: Three Key Challenges To Securing Political Commitment To Address AMR Are:

- AMR data has prevented us from understanding its scale. The quantity and complexity of the data highlight the need for independent assessments of evidence; the Inter-Agency Consultative Group recommendation for an independent panel must be delivered.
- The need for relevant high-impact policies that respond to the data: ensure that AMR policies are based on high quality data, are evidence based and integrated with pandemic preparedness thinking.
- The need to create political will and incentivize leaders to enact these policies:
  - the existing top-down pressure from experts and global leaders needs to be accompanied by consistent pressure from below;
  - civil society organizations need to be enabled to help incentivize action by policymakers and frame the challenge as an economic and food security issue as well as a health challenge.
- Biosecurity can be an important tool to

## Lessons From Agri-Food Businesses

substitute the need to cure, but biosecurity needs investment, not in funding research but as an investment in training and protocols. Then to know the system works, it must be tested to maintain quality and safety because without food security, the agri-food sector cannot function.

- Big agribusiness can operate well with less use of harmful chemicals. It is about the right people, ideation, incubation, prototyping, commercialization, and may involve pilot projects and contract farming.
1. Call on every country to champion the UN

## Call To Action

Multi-Partner Trust Fund, donating where possible.

2. Call on countries to engage with the World Bank's country teams on AMR to demonstrate interest.
3. Call on the Quadripartite to collaborate with global financing institutions, including the World Bank.
4. Call on countries to support AMR integration in the pandemic instrument to lead to greater accountability.
5. Call on countries to engage with the GLG by bringing asks to the table.
6. Call on Quadripartite to engage and bring asks from the young.





#### 5.4 Parallel session 4: Research and development

As an essential pillar for the AMR action plan, research and innovation were discussed as a core matter in this session highlighting the importance of:

- Harnessing technology - Better, and faster, point of care diagnostic tools are required, together with new IPC methods, including vaccines, alternatives, and processes and practices that overcome the human factor.
- Antibiotic development - We must continue to strive towards the sustainable discovery and development of new antibiotics, strengthened by public-private partnerships. However, not a single new class of antibiotics broadly effective against gram-negative bacteria has reached the market in over 50 years and high risk this situation will continue. So we must therefore reconsider whether the allocation of resources between drug development and transmission control and antibiotic stewardship has the right balance.

- Renewed focus on the environment - a significant reservoir of resistance genes, in particular, address antimicrobial pollution sources and reduce the environmental transmission route for pathogens, including through management of water waste. Therefore, improved sanitation should be a priority on the AMR agenda.
- Commitment to policy implementation - focus on translational research to quickly and efficiently show where and how to focus policy interventions and awareness campaign.

**The following were also discussed:**

- focus on new methods to produce data, e.g., sampling approaches/targets;
- champion the role of metagenomics;
- prioritize social science – considering the need for varied approaches that suit different country contexts.

**Recommendations**

- Encourage private funding/public-private partnerships and develop sustainable national financial and non-financial market incentives (such as fast-track approvals for new antimicrobial products and diagnostics) and global coordination mechanisms for research and development to address sectoral and cross-sectoral AMR.
- Enhance investment into developing, prioritizing and implementing context specific IPC approaches, and into building the economic case - define the price tag of inaction and articulate the cost: benefit of implementing differing IPC methods.
- Urge funders and researchers should employ impact assessments with clear indicators and targets to aid in policy and investment decisions.
- Encourage governments and philanthropic organizations to support research activities that focus on the identified areas/questions of the One Health AMR priority research agenda and embed research components into AMR national action plans.
- Enhance international research collaborations and communicate the outcomes of research more effectively across the international community.
- Encourage all to apply for membership of the new AMR Multi-Stakeholder Partnership Platform as addressing the challenge of AMR needs common coordinated actions.

# 6

Second Ministerial Plenary Panel:

## Effective Collaboration And Partnership



Following a delightful dinner and Omani social night to which all participants were invited to gather and network with each other and enjoy different flavours and activities that represent Omani culture, Day 2 and the Second Ministerial Plenary Panel commenced.

**AMR** is a complex matter that needs a comprehensive approach that requires effective collaboration and partnership.

### Key question

- What are the key ingredients needed to catalyse effective collaboration and cooperation among different sectors relevant to AMR?

Moderator

**Dr Almotasem Al Mamari**

Panellists

**HE Dr Zahid Malik**

Minister of Health and Family Welfare, (Bangladesh)

**HE Dr Cao Xuetao**

Vice Minister, National Health Commission of the People's Republic of China

**HE Dr Yasumasa Fukushima**

Vice Minister of Health (Japan)

**HE Dr Riyad Atari**

Minister of Agriculture (Palestine)

**HE Dr Abbas Jabr Al Elyawi**

Minister of Agriculture (Iraq)

**Prof Lothar Wieler**

(GLG Member)



## Summary of the discussion

- Multisectoral coordination and national action plans need to be set and reinforced by laws and regulations. It is required to focus on monitoring antimicrobial consumption, the formulation of biosecurity laws and empowering the industry.
- The climate is changing, as well as diseases. Mandates to strengthen international collaboration and adapting a One Health approach should evolve equally as fast if not get ahead of climate change and disease evolution. Global coordination and mechanisms for intercountry strengthening and leadership in multiple sectors, countries and organizations should work to this end.
- A good foundation and AMR committees is important to build. Constructing a specialized laboratory and interactive platform for consultation and evaluation as well as focussed action plans to combat the crisis is paramount. Outcomes are very important. COVID-19 was a great lesson in how to control a pandemic and gave motivation to move in a coordinated way; in the changing world today, we need collaboration.

- Prevention is key. Four topics are important in building trust-fostering a One Health approach, respecting the role of each sector, and promoting cooperation at institutions.

## Recommendations

1. Enhance the diagnostic capacities, and available and affordable tools.
2. Review the use of antimicrobials in animal health and restriction of their use.
3. Support countries with finance and technical support as it is a global issue and affects all countries.
4. Endorse the awareness at all levels.
5. Bring One Health into action.
6. International collaboration and cooperation between countries and organizations which will improve areas of gaps and weaknesses.

# 7 STATEMENTS FROM HEADS OF DELEGATION



All heads of delegation were given a three minute speech. In their speeches, they expressed their thanks and gratitude to the government of the Sultanate of Oman on organizing this high-level meeting. Most of the heads of the delegations took the opportunity and endorsed the Muscat Manifesto in their speech.



## AFGHANISTAN

A resilient health system is more responsive to combat the AMR, however the health systems in developing countries are not resilient enough to address this emerging health issue adequately.



## ALGERIA

I would also like to value the efforts of all organizers and the participants in such a conference.



## BAHRAIN

The Kingdom of Bahrain places AMR as a top priority having started the programme for the management back in 2011.



## BANGLADESH

Low-income countries are more vulnerable to the impact of AMR; political will and leadership are very crucial in combating this complex issue.



## BARBADOS

Barbados reaffirms its commitment to advocacy and action and a One Health approach which we need to tackle the scourge of AMR; We look forward to working with you towards the UNGA High-Level Meeting on AMR in 2024.



## CHINA

Faced with this situation, the Chinese government has always attached great importance to the control of microbial resistance. We establish a multisectoral coordination and cooperation mechanism.





## CYPRUS

We commit to taking all necessary actions on the basis of a One Health approach and working with other countries and international organizations in fighting this problem.



## DENMARK

The main challenge is now to move from policy to action on the ground changing behaviour to preserve the efficiency of the antibiotics that we have and for new antibiotics to come.



## EGYPT

The global nature of antibiotic resistance calls for a global response, both in the geographical area and across the whole range of sectors involved.



## FRANCE

We should also reinforce prevention action and the rationale for the good use of antibiotics in order to better care for humans and animals now and tomorrow.



## INDIA

COVID-19 pandemic highlighted the need for a whole-of-government and One Health approach as essential for tackling inter-sectoral health challenges.



## INDONESIA

Low- and middle-income countries are disproportionately impacted by AMR as they often lack sufficient access to human and animal health care services and to quality and safe medicines.



## IRAQ

We must make every effort to preserve a safe environment by adopting a more rational approach in the field of human consumption of antibiotics.



## ITALY

Recognized the urgency of improving strong governance and leadership to the AMR response, accelerating global, national and regional political commitment in investments to scale up AMR.



## JAPAN

Enhance political attention and international momentum on the importance of AMR countermeasures towards the 2024 UN General Assembly High-Level Meeting on AMR.



## JORDAN

Considering that seven out of every 10 newly discovered diseases affecting humans are of animal origin, agricultural practices had to be adjusted in an attempt to contain AMR towards enhancing the commitment to the One Health approach.



## KINGDOM OF SAUDI ARABIA

AMR demands urgent Collective and global action to develop effective and Sustainable Solutions. Therefore, we reiterate the utmost importance of reaffirming commitments of international forums, including the UN and G20.



## KUWAIT

A national action plan for Kuwait to combat AMR has been formulated in line with the global action plan, thereby contributing to combating AMR worldwide.





## LIBYA

The COVID-19 pandemic and climate changes exaggerate the problem of AMR. We stress that we need a union global protocol in fighting AMR and protocol of using antibiotics.



## MALAYSIA

Antimicrobial resistant infections also induce heavy economic burdens through loss of productivity and additional health care costs.



## MALTA

AMR has progressively raised concerns in many countries, including Malta, as many antimicrobials are losing their effects on bacteria and infections are increasing.



## MAURITANIA

This subject is very important for human life, and it is not unique for humans only but extends to animal health and plants.



## MOROCCO

Commits to continue the work on AMR prevention and control through the National Action Plan by taking actions in order to implement all the targets that are set in the Manifesto.



## NETHERLAND

COVID-19 has disrupted our lives and affected our economies and AMR may soon do the same. It is therefore crucial to relate and integrate AMR into our pandemic preparedness and response measures.



## NIGERIA

This conference paves the way to bold and specific commitments in the interest of global health security.



## PALESTINE

The slogan of the "One Health" approach is a revolution to promote collaboration between different sectors at national and global levels.



## PHILIPPINES

Acknowledges the importance of public-private collaboration and global governance in research and development to ensure timely development of new antimicrobials and tools for fast detection to contain resistant pathogens at source and prevent further transmission.



## QATAR

Putting international targets in fighting AMR will help all countries to move forward.



## RUSSIA

We intensify our efforts not only within the country but also on international scale both on a bilateral and multilateral basis.



## SOMALIA

We hope that the outcome of this high-level conference will underline the importance of the political commitments at national levels in addressing the AMR threat.





## SOUTH AFRICA

We call upon all the other countries that might want to work with us to further develop partnerships with ourselves so that we can share our experiences, and we are interested to learn best practices from other countries.



## SUDAN

AMR is an important threat to humans and animals. Sudan worked together with Quadripartite organizations on building a national action plan.



## SWEDEN

We consider implementation of national action plans of high priority. All countries must allocate sufficient resources and achieve the necessary support to set priorities and speed up the implementation of the NAPs.



## SWITZERLAND

It must be taken into account that countries which have already drastically reduced the prescription of antibiotics in veterinary medicine will probably not be able to half it again in the next few years as this would endanger the health of animals.



## SYRIA

AMR is threatening all sectors around the world. We need to work together to control the spread of AMR, especially for poor countries and countries at war.



## THAILAND

We affirmed through this extensive evaluation that we will eventually leverage the country's capacity in tackling AMR in our socioeconomic context.



## TUNISIA

COVID-19 gave us a great and good lesson on AMR: We have to work together to address that AMR threat.



## UGANDA

The critical interventions that are required moving forward to address AMR in the animal sub-sector have been identified and stakeholders are called upon to support the implementation of these activities.



## UNITED ARAB EMIRATES

AMR is one of 10 global threats as per the WHO report. It is threatening human life where no antibiotics can work.



## UNITED KINGDOM

We need focus and leadership of all countries on pulling together the food chain surveillance data.



## USA

As we have learned, major global health threats like COVID-19 and AMR cannot be addressed in a silo, and require coordinated, targeted action facilitated by close international collaboration and strong partnerships.



## YEMEN

Acknowledging the increasing burden of AMR globally and in Yemen in particular because of its current political status. AMR has a devastating effect on our economy, especially the animal sector which is one of the main resources in Yemen.

## 8 Closing Sessions



**“Excellencies, Honourable Heads Of Countries Delegations, Ladies And Gentlemen,**

It gives me great pleasure to give these closing remarks on behalf of Dr Saoud Al-Habsi, the Minister of Agriculture and Fisheries Wealth and Water Resources, and me; we have worked together for the last 12 months preparing for this conference. We have come to the end of a very productive dialogue at this conference around antimicrobial resistance. I thank all participants, panellists and moderators for their thoughtful remarks about this global threat.



**We** believe the outcomes of this conference will inform our continuous dialogue on One Health actions in the run-up to the High-Level Meeting on AMR in the 2024 United Nations General Assembly.

We have discussed critical challenges and solutions for AMR, including the political actions needed to progress in implementing the national action plans.

**The Muscat Ministerial Manifesto on AMR we discussed will help accelerate our political actions and coordination among sectors, countries and organizations.**

Excellencies, in this conference, we have had many agriculture, animal and human health representatives discuss the AMR threat and its impact on development. Let's learn our lesson from the COVID-19 pandemic and consider the science of AMR to galvanize our actions urgently. We have no time to waste.

We highly appreciate the initiative from the Kingdom of Saudi Arabia in organizing the Fourth High-Level Meeting on AMR in 2024; we wish them all the best in preparation for the conference. We look forward to meeting you again in two years in KSA.

We thank all of you who have endorsed the Manifesto so far, and it will be available for other countries to express support for a month after this meeting. Let us all be part of this foresight for AMR control. Thank you”..

**Similarly, the heads of the FAO, WHO and WOAHA gave closing remarks where they shared appreciation of the effort of the government of the Sultanate of Oman in organizing this successful meeting. They welcomed the endorsement of the Muscat Manifesto given by the majority of the countries represented in the meeting.**



# 9

## The Way Forward

**The** meeting recommendations and the Muscat Manifesto will be implemented by all countries that have endorsed them, including Oman, through One Health action. This will involve the establishment of a One Health implementation and governance body with adequate funding to oversee the execution of national plans to combat AMR.

In taking the Manifesto forward, the Sultanate of Oman is expected to advocate for it with the countries and international organizations to be included and endorsed globally in the 2024 UNGA AMR meeting. In the interim, building the national capacity for a One Health response will be of great importance to project the Sultanate as a success story and encourage other countries to move forward.

The Kingdom of Saudi Arabia has invited the next global high-level meeting on AMR so that it continues to be a political forum for countries, discussion of AMR's global control effort and paving the way forward.

## Annex

### 1. List of attendees

S. No	Country
1	Afghanistan
2	Algeria
3	Bahrain
4	Bangladesh
5	Barbados
6	China
7	Cyprus
8	Denmark
9	Egypt
10	France
11	India
12	Indonesia
13	Iraq
14	Italy
15	Japan
16	Jordan
17	Kenya
18	Kingdom of Saudi Arabia
19	Kuwait
20	Lebanon
21	Libya
22	Malaysia

23	Malta
24	Mauritania
25	Morocco
26	Netherlands
27	Nigeria
28	Oman
29	Palestine
30	Philippines
31	Qatar
32	Russia
33	Somalia
34	South Africa
35	Sudan
36	Sweden
37	Switzerland
38	Syria
39	Thailand
40	Tunisia
41	UAE
42	Uganda
43	United Kingdom
44	USA
45	Yemen

### 2. Muscat Manifesto

<https://www.amrconference2022.om/MuscatManifesto.html>

### 3. SUMMARY OF COUNTRIES WHICH ENDORSE THE MUSCAT MANIFESTO

NUMBER	COUNTRY
1	KINGDOM OF SAUDI ARABIA
2	SWEDEN
3	BAHRAIN
4	BANGLADESH
5	BARBADOS
6	CYPRUS
7	EGYPT
8	INDONESIA
9	ITALY
10	JORDAN
11	KUWAIT
12	LIBYA
13	MALAYSIA
14	MALTA
15	MOROCCO
16	MAURITANIA
17	NETHERLANDS
18	NIGERIA
19	PALESTINE
20	PHILIPPINES
21	QATAR
22	RUSSIA
23	SOMALIA

24	SUDAN
25	SOUTH AFRICA
26	SYRIA
27	THILAND
28	TUNISIA
29	UAE
30	ALGERIA
31	UGANDA
32	YEMEN
33	INDIA
34	SWITZERLAND
35	SPAIN
36	IRELAND
37	LEBANON
38	PORTUGAL
39	ANDORRA
40	UNITED KINGDOM
41	ARGENTINA
42	BRUNEI
43	ST. VINCENT AND THE GRENADINES
45	SURINAME
46	ZIMBABWE
47	OMAN







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24-25 November 2022