



AMR STAKEHOLDER MAPPING

From ReAct Europe – Action on Antibiotic Resistance

A global mapping of stakeholders working with antimicrobial resistance.

2016-02-18

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List of Abbreviations

AGISAR:	Advisory Group on Integrated Surveillance of Antimicrobial Resistance
AMR:	Antimicrobial Resistance
ANSORP:	Asian Network for Surveillance of Resistant Pathogens
APFID:	Asia-Pacific Foundation for Infectious Diseases
APUA:	Alliance for the Prudent Use of Antibiotics
ARC:	Antibiotic Resistance Coalition
ARLG:	Antibiotic Resistance Leadership Group
CAC:	Codex Alimentarius Commission
CAESAR:	Central Asian and Eastern European Surveillance on Antimicrobial Resistance
CDC:	Centers for Disease Prevention and Control
CDDEP:	Center for Disease Dynamics, Economics and Policy
CGIAR:	Consultative Group for International Agricultural Research
CI:	Consumers International
CSO:	Civil Society Organization
DNDi:	Drugs for Neglected Diseases initiative
DRIVE-AB:	Driving reinvestment in research and development and responsible antibiotic use
EARS-NET:	European Antimicrobial Resistance Surveillance Network
EASAC:	European Academies Science Advisory Council
EC:	European Commission
ECDC:	European Center for Disease Prevention and Control
EEA:	European Economic Area
EFPIA:	European Federation of Pharmaceutical Industries and Associations
EFSA:	European Food Safety Authority
EIB:	European Investment Bank
EMA:	European Medicines Agency
EPN:	Ecumenical Pharmaceutical Network
ESAC-NET:	European Surveillance of Antimicrobial Consumption Network
ESVAC:	European Surveillance of Veterinary Antimicrobial Consumption
EU:	European Union
EUCAST:	European Commission on Antimicrobial Susceptibility Testing
EWEC:	Every Woman Every Child
FAO:	Food and Agricultural Organization of the United Nations
FDA:	US Food and Drug Administration
FIND:	Foundation for Innovative New Diagnostics
GARP:	Global Antibiotic Resistance Partnership
GLASS:	Global Antibiotic Resistance Surveillance System
IFPMA:	International Federation of Pharmaceutical Manufacturers and Associations
IGO:	Intergovernmental Organization
IMI:	Innovative Medicines Initiative

JPIAMR: Joint Programming Initiative on AMR
LMIC: Low- and Middle-Income Country
MSF: Médecins Sans Frontières - Doctors Without Borders
NDPHS: Northern Dimension Partnership in Public Health and Social Wellbeing
ND4BB: New Drugs for Bad Bugs
NGO: Non-Governmental Organization
NIAID: National Institute of Allergy and Infectious Diseases
NIH: National Institutes of Health
OGA: US Office of Global Affairs
OIE: World Organization for Animal Health
PAHO: Pan American Health Organization
TATFAR: Transatlantic Taskforce on AMR
TWN: Third World Network
UNGA: United Nations General Assembly
WAAAR: World Alliance Against Antibiotic Resistance
WEF: World Economic Forum
WHA: World Health Assembly
WHO: World Health Organization
WHO AFRO: WHO African Regional Office
WHO EMRO: WHO Eastern Mediterranean Office
WHO EURO: WHO European Regional Office
WHO PAHO: WHO Regional Office for the Americas
WHO SEARO: WHO South-East Asia Regional Office
WHO WPRO: WHO Western Pacific Regional Office

Introduction and Methodology

In this stakeholder mapping, we provide an overview of current key actors in the field of antimicrobial resistance (AMR). Given the complexity that AMR poses and the range of societal concerns it impacts on, the list of potential stakeholders that could be included is rather substantial. We have therefore developed a set of inclusion and exclusion criteria, which will be outlined below. Our selection criteria prioritize actors in certain areas, and while the final list of stakeholders included in this mapping does not amount to a comprehensive account of all agencies, initiatives and organizations that currently exist, we believe that it captures all relevant actors in key policy areas.

Categorization of stakeholders

The mapping divides **stakeholders** into the following **five categories**:

1. **Policy**
2. **Advocacy**
3. **Innovation & Research**
4. **Surveillance**
5. **Funding**

Our mapping is further divided into actors that operate at the **global** or the **regional level**. This division was deemed important to illustrate the outreach and potential impact that stakeholders may have. We also categorized organizations according to their **focus area of work**, and chose to include **three focus areas**:

- Human health (**H**)
- Animal health (**A**)
- Environmental effects (**E**)

Research Process

To arrive at the final list of stakeholders included in this mapping, the authors went through a multi-step process:

- Identification of categories of stakeholders to be included, in collaboration with WHO
- Agreement on inclusion and exclusion criteria for stakeholders
- Identification of potential stakeholders for inclusion
- Review of stakeholder list among authors and categorization into the five areas to be included in the report
- Interviews with key contacts within the field of AMR about suitable institutions and organizations to be included
- Review and adjustment of initial list

- Agreement on final list of stakeholders to be included
- Separation of stakeholders into global and regional actors
- Desk research and drafting process
- Internal review and validation

Inclusion and Exclusion Criteria for Stakeholders

To decide, which stakeholders to consider, we defined a list of inclusion and exclusion criteria:

1. Sites of activity
 - a. For global stakeholders: active on more than one continent
 - b. For regional stakeholders: active in more than one country
2. Dedicated, explicit commitment to work on AMR

In accordance with the prioritization in Global Action Plan, stakeholders were included if their work was primarily related to antibiotic resistance. Organizations working exclusively on issues of antiviral resistance (e.g. in the treatment of HIV/AIDS) or focusing exclusively on specific bacterial diseases (e.g. tuberculosis) were not considered. To be included, organizations must have a secretariat or other established structure to ensure ongoing activity. Some initiatives or organizations, which were included (e.g. some multi-national policy initiatives, surveillance networks or funding initiatives) did not strictly meet this criterion, but were deemed to be of particular importance to ongoing work in the field of AMR.
3. To be included, organizations must be actively involved in AMR issues. As a result, only organizations, which were active at some point over the last three years were considered for inclusion.
4. National initiatives were excluded, when their work focused entirely on interventions in one country.
5. National aid organizations were also excluded.
6. Professional societies, such as medical councils, which routinely work with AMR were not included in this list
7. Funders and initiatives were only included if they already commenced their work. Intent to work on issues relating to AMR in the future was insufficient for inclusion.

Limitations

Given the complexity of AMR as a policy challenge, this stakeholder mapping cannot include every organization at the national or regional level that is committed to working on AMR. The division into global and regional actors may have ruled out the inclusion of bilateral agreements, which were not widely publicized. Furthermore, national agencies working on AMR (e.g. Public Health Agencies) are currently not included.

For the desk research, which formed the basis for this report, only websites available in English were consulted, which inevitably excluded a number of actors in countries and regions where English is not widely spoken. In addition, this mapping only considers stakeholders that specifically address AMR. Where this involvement is part of another activity or focused on a single disease or pathogen (for example as part of efforts to reduce the burden of tuberculosis), stakeholders were not included.

Finally, this mapping relies on the accuracy of publicly reported information. Facts and figures cited in this report are based on data reported by stakeholders, and responsibility for their factual accuracy lies with the reporting institution.

The stakeholder mapping was completed on February 18, 2016.

Global stakeholders and initiatives

Policy

UN Institutions

World Health Organization - AMR Secretariat

Category: Policy | Global

Focus: H, A, E

Location: Geneva, Switzerland

Website: http://www.who.int/drugresistance/global_action_plan/director-amr-secretariat/en/

About

The World Health Organization is the directing and coordinating authority on international health within the United Nations' system. WHO currently defines its role in public health as follows:

- providing leadership on matters critical to health and engaging in partnerships where joint action is needed;
- shaping the research agenda and stimulating the generation, translation and dissemination of valuable knowledge;
- setting norms and standards and promoting and monitoring their implementation;
- articulating ethical and evidence-based policy options;
- providing technical support, catalyzing change, and building sustainable institutional capacity, and
- monitoring the health situation and assessing health trends.

Headquartered in Geneva, Switzerland, WHO was established in 1948 and currently has 194 Member States. More than 7000 people from more than 150 countries work for the Organization in over 150 WHO country offices, 6 regional offices, and headquarters. WHO is financed by contributions from Member States and outside donors.

AMR related activities

The World Health Assembly (WHA) adopted the Global Action Plan on Antimicrobial Resistance (GAP) in May 2015. The action plan reflects global consensus that antimicrobial resistance poses a profound threat to human health and is the first global action plan on antimicrobial resistance endorsed by all its Member States. It sets out five strategic objectives:

- to improve awareness and understanding of antimicrobial resistance;
- to strengthen knowledge through surveillance and research;
- to reduce the incidence of infection;
- to optimize the use of antimicrobial agents; and

- to ensure sustainable investment in countering antimicrobial resistance.

Following the adoption of the global action, WHO established a Secretariat for Antimicrobial Resistance, which is located in the Office of the Director-General, to coordinate the work on AMR across WHO's different departments, regional offices and country offices). The Director-General also appointed a Special Representative for Antimicrobial Resistance to provide international leadership and gain further political and intersectoral backing to address antimicrobial resistance through the United Nations General Assembly (UNGA). The Special Representative for Antimicrobial Resistance will further ensure that all relevant parts of the Organization are actively engaged and coordinated.

WHO has a significant and unique role to play in combating AMR and has defined two major priorities for 2016-2017. WHO will provide international leadership and coordination to raise awareness and gain further political and intersectoral backing to address antimicrobial resistance through the UNGA and build the consensus and partnerships needed to implement the global action plan.

In parallel, WHO will implement the technical work set out in the GAP and the WHA's resolution 68.7 in support to the GAP, using a "one health" approach in collaboration with FAO and OIE, where appropriate. This includes taking specific actions under each of the five objectives in the GAP and supporting countries in developing and implementing national action plans on AMR.

Food and Agriculture Organization of the United Nations (FAO)

Category: Policy | Global

Focus: A, E

Location: Headquarters in Rome, regional and country offices in member states

Website: <http://www.fao.org/antimicrobial-resistance/en/>

About:

The Food and Agriculture Organization of the United Nations (FAO) is an international agency that works on eliminating hunger, food insecurity and poverty. In addition, FAO promotes the sustainable use and management of natural resources and their preservation for future generations. The FAO was founded in 1945 and currently has 194 member states, plus the European Union as a member region. The organization is financed by membership contributions.

AMR-related activities:

FAO has been a vocal actor in drawing attention to the need for concerted action on AMR, and the need for better integration between policies on human and animal consumption of antibiotics. The FAO is also part of the Tripartite (WHO, FAO, OIE), which addresses AMR at the global level from a 'One Health' perspective. It provides advice and expertise in the areas of animal health, animal production, food safety and plant health. In its most recent Annual Conference in June 2015, FAO passed a resolution on the need for a global concerted effort to address AMR.

To reduce the impact of AMR, FAO supports countries on a number of levels and through different activities. These include¹:

1. Promotion of good hygiene practices to control the spread of AMR through food
2. Inclusion of antimicrobial resistance as an issue to be addressed in the Codex Alimentarius
3. Promotion of efficient livestock husbandry and good farming practice to improve animal health
4. Formulation of guidelines for prudent use of antimicrobials in aquaculture
5. Promotion of vaccination for infection prevention, and improved biosecurity
6. Advice on responsible use of antimicrobials
7. A 'One health' approach to the management of antimicrobial resistance that recognizes the links between animals, humans and ecosystems.

To coordinate these activities, FAO has established a working group on AMR. The group meets regularly and brings together FAO officers from Animal Health, Animal Production, Codex Alimentarius, Fisheries, Food Safety and Plant health.

Tripartite Collaboration: WHO FAO and OIE

Category: Policy | Global

Focus: H, A, E

Location: Geneva / Paris / Rome (respective headquarters of membership organizations)

Website: http://www.who.int/foodsafety/areas_work/zoonose/concept-note/en/ (concept note for activities covered under the Tripartite collaboration)

About:

Following a concept note in 2010, WHO, FAO and OIE established a Tripartite collaboration to share responsibilities and coordinating global activities. The collaboration was designed to focus on health threats at the human-animal-ecosystem interface, such as AMR, which pose risks to public health, animal health and global health security. WHO, FAO and OIE work in together to strengthen cross-sectoral collaboration and communication, and to address risks from zoonoses and other public health threats.

AMR-related activities:

The Tripartite collaboration conducts its work through workshops and regular meetings of representatives of member organizations. The work of the Tripartite on AMR complements the activities of WHO, FAO and OIE in this field. The Tripartite addresses AMR from a 'One Health' perspective and focuses on three goals²:

¹ See <http://www.fao.org/antimicrobial-resistance/en/>

² WHO, FAO, and OIE unite in fight against the AMR (2015) fact sheet, http://www.who.int/foodsafety/areas_work/antimicrobial-resistance/amr_tripartite_flyer.pdf?ua=1

1. Ensure that antimicrobial agents continue to be effective and useful to cure diseases in humans and animals
2. Promote prudent and responsible use of antimicrobial agents
3. Ensure global access to medicines of good quality

The Tripartite's work towards these goals will include the following activities across human, animal and environmental health:

- Awareness raising
- Strengthening national capacities to address AMR
- Supporting countries to establish appropriate policy, institutional and regulatory frameworks and networks
- Supporting harmonized AMR surveillance and global monitoring of usage of antimicrobials
- Promoting research into new antibiotics, diagnostics, and new methods of infection prevention and control
- Addressing the problem of counterfeit drugs
- Reducing the need for antimicrobials by promoting better infection prevention standards

CODEX Alimentarius Commission

Category: Policy | Global

Focus: A

Location: Secretariat in Rome, Italy

Website: <http://www.codexalimentarius.org/>

About:

The Codex Alimentarius Commission (CAC) is an intergovernmental body with 187 members (member states and the EU) and 234 observers (NGOs, IGOs, and UN agencies), with the purpose of protecting the health of consumers and ensuring fair practices in the food trade. The Commission also promotes coordination of all international food standards.

The decisions of the Commission are published in the Codex Alimentarius, which is an extensive collection of international food standards, guidelines and codes of practice. The Codex Alimentarius Commission was set up in 1963, and it now governs the standards of almost all food products in the world.

AMR-related activities:

The Codex Alimentarius contains guidelines and codes of practice on minimization and containment of AMR in animal husbandry. These guidelines contain detailed responsibilities of farmers, veterinarians, the pharmaceutical industry, food producers and retailers in relation to the appropriate use of antibiotics in animals. The codex also contains guidelines for risk analysis

of foodborne AMR. The CAC has worked on AMR primarily through the regulation on residues of veterinary drugs in food. It also established an ad hoc Intergovernmental Task Force on Antimicrobial Resistance, which concluded its work in 2011.

World Bank (WB)

Category: Policy | Global

Focus: H

Location: Washington, D.C., USA

Website: <http://www.worldbank.org>

About:

The World Bank is an international financial institution that provides loans to LMICs and is a part of the UN system. In line with its global strategy for health, nutrition, and population, the World Bank provides financing, analysis, and policy advice to help countries expand access to affordable health care. The World Bank's program on health focuses primarily on health system strengthening and has traditionally not included programs for specific diseases.

AMR-related activities:

So far, AMR has not been at the center of World Bank activity and there is no dedicated program for work on drug resistance. However, the World Bank is involved in monitoring progress of universal health coverage through the Joint WHO/World Bank Group Report. Moreover, the World Bank has been working together with the Tripartite organizations (WHO, FAO, OIE) on the development of a 'One Health' approach in order to reduce health risks at the human-animal interface and as part of its efforts to strengthen pandemic preparedness.³ As part of this collaboration, assessment tools for health systems⁴, both clinical and veterinary were developed, but have so far not been implemented, due to lack of funding. In 2014, the World Bank Group President also stated that the World Bank was committed to extending its work on AMR, including a cost-analysis and greater alignment of its work with WHO, FAO and OIE.⁵

³ <http://www.worldbank.org/en/topic/pandemics/overview#2>

⁴ WHO-OIE (2014) Operational Framework, <http://www.oie.int/for-the-media/press-releases/detail/article/bridging-who-and-oie-tools-to-better-control-global-health-risks-at-the-human-animal-interface/>

⁵ For a video of the announcement by World Bank Group president Jim Yong Kim, see <http://www.worldbank.org/en/news/video/2014/07/11/jim-yong-kim-antimicrobial-resistance-crosses-boundaries-sectors>

Every Woman Every Child (EWEC)

Category: Policy | Global

Focus: H

Location: New York, USA

Website: <http://www.everywomaneverychild.org/>

About:

Launched by the UN Secretary-General in 2010, EWEC is a global initiative that strengthens international and national action by stakeholders from both governments, multilateral institutions and the private sector including civil society to address the major health challenges facing women and children around the world. The initiative builds on the Global Strategy for Women's and Children's Health, which outlines a roadmap on how to enhance financing, strengthen policy and improve services on the ground for the most vulnerable women and children.⁶

AMR-related activities:

13 life-saving commodities⁷

EWEC's Global Strategy highlighted the impact that a lack of access to life-saving commodities has on the health of women and children around the world, which led to the formation of the UN Commission on Life-Saving Commodities for Women's and Children's Health. The Commission was tasked with increasing access to life-saving medicines and health supplies for the world's most vulnerable populations. The Commission identified a set of 13 overlooked life-saving commodities across the reproductive, maternal, newborn, and child health (RMNCH) 'continuum of care'. Effective antibiotics are included among these commodities.

UN briefing on AMR⁸

In June 2015, EWEC co-organized an event entitled 'Antimicrobial resistance: An emerging Global Threat', which was held at the United Nations' Headquarters in New York. The meeting brought together a panel of experts to share research findings and discuss the significant challenges of antimicrobial resistance together with representatives from several missions in attendance actively participating in the dialogue.

Alliance of Champion Countries

Category: Policy | Global

Location: n/a

Focus: H, A, E

⁶ EWEC (2015) Global strategy 2.0, <http://globalstrategy.everywomaneverychild.org>

⁷ UN Commission on Life-Saving commodities (2012) 13 live-saving commodities, <http://www.everywomaneverychild.org/networks/life-saving-commodities>

⁸ EWEC (2015) UN briefing on AMR <http://www.everywomaneverychild.org/news-events/news/1107-antimicrobial-resistance-an-emerging-global-threat>

Website: <http://www.swemfa.se/2015/06/11/the-alliance-of-champions-the-fight-against-antimicrobial-resistance-amr/>

About:

During a meeting in Geneva in April 2015, health ministers of 14 countries signed a call to action on AMR.⁹ The ministers called for global commitment to fight AMR and to implement the GAP on AMR. In addition, they committed themselves to promoting increased political awareness, engagement and leadership on the issue. The ministers also called for a high-level meeting on AMR in the UN General Assembly in 2016. The call to action was signed by the ministers of health from Brazil, China, Germany, Mexico, the Netherlands, Norway, Pakistan, the Republic of Korea, South Africa, Sweden, Thailand, the United Kingdom, the United States and Zambia.

High-level Panel on Health Technology Innovation and Access

Category: Policy | Global

Focus: H

Location: N/A

Website:

<http://www.un.org/press/en/2015/sga1608.doc.htm>

About:

In November 2015, the UN Secretary General established the High-Level Panel on Health Technology Innovation and Access with 16 members, to support the achievement of Sustainable Development Goal (SDG) no. 3 (Ensuring healthy lives and promoting wellbeing for all at all ages). The proposed scope of the panel's work is *"to review and assess proposals and recommend solutions for remedying the policy incoherence between the justifiable rights of inventors, international human rights law, trade rules and public health in the context of health technologies."* The panel had its first meeting in December 2015 and will present a set of recommendations to the Secretary-General in June 2016.

AMR-related activities:

Currently, it is not clear if the panel will specifically address the issue of AMR. However, SDG 3 aims to ensure essential healthcare services and access to safe, effective, quality and affordable essential medicines and vaccines for all. Moreover, the panel's work on the creation of new business models for medicines and diagnostic tests will likely be of great importance to the future development of new antibiotics.

⁹ For the signed call to action, see https://www.bundesgesundheitsministerium.de/fileadmin/dateien/Englische_Dateien/150519_Signed_CALL_to_Action_on_AMR_Ministerial_Breakfast.pdf

Intergovernmental and International Institutions

World Organization for Animal Health (OIE)

Category: Policy | Global

Focus: A, E

Location: Headquarters in Paris, France, regional and sub-regional offices on every continent.

Website: <http://www.oie.int/our-scientific-expertise/veterinary-products/antimicrobials/>

About:

OIE is an intergovernmental organization that is responsible for improving animal health worldwide and has a total of 180 Member Countries. In addition, OIE maintains permanent relations with 45 international and regional organizations, including e.g. the WTO, the World Bank, the European Commission and the International Dairy Federation. Together with WHO and FAO it is part of the Tripartite.

AMR-related activities:

The OIE promotes the responsible use of antimicrobials in animals to prevent the emergence of AMR, and has been active in this field for over a decade.

Over the past decade, OIE has developed intergovernmental standards on antimicrobial resistance and on the monitoring of the quantities of antimicrobial agents used, which are frequently updated.¹⁰ More specifically, these include:

1. Guidelines and standards on antibiotic use in terrestrial and aquatic animals¹¹
2. Guidelines for monitoring and surveillance of AMR in animals
3. Manuals for risk assessment for the emergence of AMR in farm animals as a result of antimicrobial use
4. Laboratory guidelines for bacterial antimicrobial susceptibility testing

OIE maintains a worldwide network of reference laboratories and works with several collaborating centers at the regional level for purposes of data collection, harmonization of international standards, and scientific exchange. In addition, OIE has an ad hoc working group on AMR, which also includes members from other Tripartite organizations (FAO and WHO).

¹⁰ For a more detailed overview of OIE's guidelines on AMR see <http://www.oie.int/en/our-scientific-expertise/veterinary-products/antimicrobials/>

¹¹ OIE's terrestrial and aquatic animals health codes are available at <http://www.oie.int/en/international-standard-setting/overview/>

Global Health Security Agenda (GHSA)

Category: Policy | Global

Focus: H, A, E

Website: <http://ghsagenda.org/packages/p1-antimicrobial-resistance.html>

About:

The Global Health Security Agenda (GHSA) is a multilateral and multi-sectoral initiative of over 40 countries to enhance global capacities to prevent, detect, and respond to infectious disease threats. Originally set up in 2014 by 29 states, WHO, FAO and OIE, the GHSA seeks to invest into capacity building, primarily in the areas of infrastructure, equipment, and health care personnel. GHSA is intended to accelerate action and spur progress toward implementation of the World Health Organization's International Health Regulations and other global health security frameworks, such as the World Organization for Animal Health's Performance of Veterinary Services Pathway. The GHSA also engages CSOs, academic and research institutes and the private sector.

The GHSA has defined 11 action packages. Each action package contains a number of objectives, and indicators for monitoring and evaluation. The 11 action packages are:

1. Countering antimicrobial resistance
2. Preventing the emergence and spread of zoonotic disease
3. Advancing a whole-of-government national biosafety and biosecurity system in every country
4. Improving immunization
5. Establishing national laboratory systems
6. Strengthening real-time bio-surveillance
7. Advancing timely and accurate disease reporting at national and global level
8. Training a global health workforce
9. Establishing emergency operations centers
10. Linking public health, law and multi-sectoral rapid response units to better respond to infectious disease outbreaks
11. Establishing a system for exchanging medical countermeasures and health care personnel during public health emergencies.

Over the past year, the number of member states has increased significantly, together with financial commitments to GHSA activities. However, these resources will be spread across all action packages.

AMR-related activities:

The first action package on AMR will be based on a 'One Health' approach and in line with the Global Action Plan on AMR. GHSA supports the work that is coordinated by WHO, FAO, and OIE to develop an integrated global response to AMR and GHSA member states will support

LMICs in addressing AMR. Activities over the current five-year funding period will primarily focus on three areas¹²:

1. Assisting with the development of National Action Plans to combat AMR
2. Supporting the development and strengthening of laboratory capacity
3. Preservation of existing treatments and collaboration to support the sustainable development of new antibiotics and diagnostics

GHSA has developed a common set of 11 targets and an external assessment tool, which has now been piloted in 5 countries: Georgia, Peru, Portugal, Uganda, and the United Kingdom.¹³ GHSA's efforts in the area of AMR will be led by Canada, Germany, the Netherlands, Sweden and the United Kingdom but will receive support from other GHSA member states.

The GHSA is funded by its member states and the US government has recently announced that it plans to expand the GHSA by providing up to \$1 billion in additional funds over the coming years¹⁴.

G7

Category: Policy | Global

Focus: H, A, E

Location: n/a

Website: http://www.bmg.bund.de/fileadmin/dateien/Downloads/G/G7-Ges.Minister_2015/G7_Health_Ministers_Declaration_AMR_and_EBOLA.pdf

About:

The G7 is the intergovernmental group of seven major advanced economies: Canada, France, Germany, Italy, Japan, the UK and the US. The group was originally founded to facilitate shared macroeconomic initiatives but now also represents a discussion platform for collaborative work on global challenges.

AMR-related activities:

Following the most recent meeting in Germany, the G7 health ministers presented a declaration on AMR. This 'Berlin Declaration on Antimicrobial Resistance' included the announcement of a Global Union for Antibiotics Research and Development (GUARD).

The G7 declaration lists a number of commitments of G7 states in the area of AMR. These include:

¹² For an overview of GHSA's AMR Action Package see http://www.cdc.gov/globalhealth/security/actionpackages/antimicrobial_resistance.htm

¹³ For the GHSA country assessments see <http://www.cdc.gov/globalhealth/security/>

¹⁴ White House (2015) FACT SHEET: Global Health Security Agenda <https://www.whitehouse.gov/the-press-office/2015/07/28/fact-sheet-global-health-security-agenda>

- Support for initiatives by the Tripartite, including the Global Action Plan on AMR
- Greater emphasis on a 'One Health' approach
- Support for at least 60 countries to develop capacity to combat AMR, as part of Tripartite mechanisms and the Global Health Security Agenda
- Strengthening of infection prevention initiatives
- Support for awareness campaigns to inform the public about AMR
- International support for multi-sectoral antibiotic stewardship projects
- Harmonization of quality standards for the production of antibiotics
- Harmonization of surveillance standards for clinical and veterinary use of antibiotics and AMR

In addition, a number of new initiatives were announced. These include:

1. The creation of a global network of researchers and organizations working on AMR, to facilitate better exchange of information. The first meeting will be held in Germany in 2016/17.
2. The exploration and feasibility study for a global antibiotic product development partnership, which will work on new antibiotics, vaccines and diagnostics.
3. A high-level meeting on AMR at the UN General Assembly in 2016.

G20

Category: Policy | Global

Focus: H, A, E

Location: China (2016)

Website: <http://www.g20.org/English/>

About:

The G20 is an international forum for the intergovernmental dialogue of 20 major economies. It provides a high-level discussion platform to study international policy issues.

AMR-related activities:

The G20 countries have previously discussed the issue of AMR at the G20 meeting in Antalya, Turkey in 2015. China in particular has taken a lead on this issue and has also sought to strengthen collaboration in the area of AMR with other countries (see e.g. the UK-China Antimicrobial Initiative).

G77

Category: Policy | Global

Focus: H

Location: n/a

Website: <http://www.g77.org/>

About:

The Group of 77 is the largest intergovernmental body of developing countries in the United Nations. It provides a forum for the countries of the South to articulate and promote their collective economic interests and enhances their joint negotiating capacity on all major international economic issues within the United Nations system. In addition, the G77 promotes South-South cooperation for economic development.

AMR-related activities:

During the G77 Summit in Santa Cruz in 2014, the G77 expressed concern over the AMR situation and urged international health authorities and organizations to take action and assist developing countries that lack adequate resources with the development of appropriate national responses to the threat. It is expected that the G77 will continue to address AMR, however so far no specific agenda has been announced¹⁵.

Organisation for Economic Co-operation and Development (OECD)

Category: Policy | Global

Focus: H, A

Location: Secretariat in Paris, France

Website: <http://www.oecd.org/els/health-systems/Antimicrobial-Resistance-in-G7-Countries-and-Beyond.pdf>

About:

The OECD is an intergovernmental body with 34 members, which was set up in 1961. Its 2015 budget stands at \$ 363 million. The organization's activities focus on:

- achieving high and sustainable economic growth and employment in member countries, while maintaining financial stability
- contributing to sound economic expansion in member states and in countries that are in the process of economic development
- contributing to the expansion of world trade

¹⁵ G77 (2014) Summit Declaration, [http://www.g77.org/doc/A-68-948\(E\).pdf](http://www.g77.org/doc/A-68-948(E).pdf)

For member states, the OECD provides a forum for discussing and addressing shared economic problems. The OECD also sets international standards on a wide range of issues, from agriculture and tax to the safety of chemicals.

AMR-related activities:

The organization addresses the issue of AMR via publications for towards both scientific and political audiences. In its recent publications it presented a strong case for G7 action in the area of AMR. The OECD has also conducted work on potential future threats, and commissioned a report on the potential impact of pandemics.¹⁶ This report also discussed the effect of AMR on. More recently, the OECD commissioned a report on antibiotic use in livestock.¹⁷

Trans Atlantic Task Force on AMR (TATFAR)

Category: Policy | Global

Focus: H, A

Location: Secretariat hosted by CDC in Atlanta, USA (previously hosted by ECDC in Stockholm, Sweden)

Website: <http://www.cdc.gov/drugresistance/tatfar/about.html>

About:

Following an EU-US summit in 2009, TATFAR was initiated with the aim of creating communication channels and a platform for collaboration between US and EU agencies. TATFAR works through regular meetings, workshops and joint reports between health agencies on the issue of AMR in the US and the EU.

The US institutions that participate in TATFAR include the Centers for Disease Prevention and Control (CDC), the Food and Drug Administration (FDA), the National Institutes of Health (NIH), the National Institute of Allergy and Infectious Diseases (NIAID) and the Office of Global Affairs (OGA).

The European Union is represented by the European Commission's Directorate-General for Health, the EC-Directorate General for Research, the European Centre for Disease Prevention and Control (ECDC), the European Medicines Agency (EMA) and the European Food Safety Authority (EFSA). TATFAR was originally scheduled to run until 2016, but it is expected that the task force will continue its work for longer.

¹⁶ OECD (2011) 'Future Global Shocks', <http://www.oecd.org/gov/risk/46889985.pdf>

¹⁷ OECD (2015) *Global Antimicrobial Use in the Livestock Sector*, <http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=TAD/CA/APM/WP%282014%2934/FINAL&docLanguage=En>

AMR-related activities:

TATFAR's work is organized around three areas of concern for AMR:

1. Appropriate therapeutic use of antimicrobial drugs in the medical and veterinary communities
2. Better prevention of healthcare- and community-associated drug-resistant infections
3. Strategies for improving the pipeline of new antimicrobial drugs.

After its formation, TATFAR formulated 17 recommendations for EU-US collaboration¹⁸, pertaining to the three areas of concern. These were reviewed in 2014¹⁹ and a revised list of 16 recommendations has been adopted for the period from 2014-2016. Each recommendation was designed to improve communication or collaboration in the areas covered by TATFAR. Outcomes to date have included better communication protocols and joint publications on existing methods of surveillance and antibiotic prescribing in member states.

International Federation of Pharmaceutical Manufacturers & Associations (IFPMA)

Category: Policy | Global

Focus: H, A, E

Location: Geneva, Switzerland

Website: <http://www.ifpma.org/innovation/anti-microbial-resistance.html>

About:

The IFPMA represents the research-based pharmaceutical industry. It has a dedicated AMR group, which was previously located at the European Federation of Pharmaceutical Manufacturers and Associations (EFPIA).

AMR-related activities:

IFPMA and its member organizations have pledged to continue to fund research and development of new antibiotics and to work with international organizations to support antimicrobial stewardship and responsible use of antibiotics. These focus areas were also outlined in the report 'Rethinking the way we fight bacteria from 2015'.²⁰ In addition, IFPMA is involved in the project DRIVE-AB, which aims to develop new models to incentivize antibiotic discovery. IFPMA has also been vocal about policy changes and has proposed strategies to combat and contain AMR. In a recent statement on AMR at the 68th World Health Assembly the organization called for accelerating regulatory approvals of new pharmaceutical leads²¹.

¹⁸ TATFAR (2014) *Actions and recommendations*,
http://www.cdc.gov/drugresistance/tatfar/tatfar_recomendations.html

¹⁹ TATFAR (2014) *Progress report* <http://www.cdc.gov/drugresistance/tatfar/report.html>

²⁰ IFPMA (2015) *Rethinking the way we fight bacteria*,
http://www.ifpma.org/fileadmin/content/Publication/2015/IFPMA_Rethinking_the_way_we_fight_bacteria_April2015_FINAL.pdf

²¹ IFPMA (2015) *Statement on AMR at the 68th World Health Assembly*,
http://www.ifpma.org/fileadmin/content/Events/Statements/IFPMA_Statement_WHA68_AMR.pdf

Consultative Group for International Agricultural Research (CGIAR)

Category: Policy | Global

Focus: A, E

Location: Montpellier, France

Website: <http://www.a4nh.cgiar.org/our-people/>

About:

CGIAR is a global partnership of agricultural research centers, which was founded in 1971 and currently has 15 active member centers, which make up the CGIAR consortium. CGIAR also collaborates with a large number of CSOs, as well as national and international political actors. CGIAR is funded by contributions of its members and is not part of the UN or any other international organization.

AMR-related activities:

CGIAR has recently launched a new research program called Agriculture for Nutrition and Health, which examines the impact of agricultural practices on human health. This program also focuses on the consequences of antimicrobial use in agriculture and has recently published a review of AMR in animal agriculture in low- and middle income countries.²²

²² IRLI (2015) 'Review of Evidence on Antimicrobial Resistance and Animal Agriculture in Developing Countries', http://r4d.dfid.gov.uk/pdf/outputs/EoD/EoD_Consultancy_June15_Ag_Related_AMR.pdf

Policy Institutes and Think Tanks

The Review on Antimicrobial Resistance

Category: Policy Institutes and Think Tanks| Global

Focus: H, A, E

Location: London, England

Website: <http://amr-review.org/>

About:

The Review on Antimicrobial Resistance was commissioned by the UK Prime Minister in July 2014 and reports directly to the Prime Minister's office. The Review is headed by Jim O'Neill, formerly chief economist at Goldman Sachs. The AMR Review's work is supported by several government agencies, including the UK Department of Health, the Treasury, and the Foreign and Commonwealth Office. However, the review team operates independently and autonomously. The Wellcome Trust is providing funding towards the Review's work, and also hosts the review team at its London offices. The Review aims to publish its final conclusions and recommendations for future actions no later than August 2016.

AMR-related activities:

The AMR Review's aim is to explore options for action to combat AMR at both the national and international level. To this end, the AMR Review has already published a series of influential publications on different issues related to antimicrobial resistance. Publications to date have focused on the following issues:

1. The global burden of AMR
2. Options for improving the development pipeline for new antibiotics
3. Options for improving innovation and research into new rapid diagnostics
4. Improving the antibiotic supply chain
5. Reducing antimicrobial use in agriculture and the environment
6. Vaccines and alternative approaches

Chatham House

Category: Policy Institutes and Think Tanks | Global

Location: London, United Kingdom

Focus: H

Website: <http://www.chathamhouse.org/about/structure/global-health-security/antimicrobial-resistance-project>

About:

Founded in 1920, Chatham House is an independent policy institute with a focus on international affairs. It conducts research into a broad range of policy-related topics and offers a platform for open debate and confidential discussion.

AMR-related activities:

The Centre on Global Health Security at Chatham House examines key global health challenges and how they manifest themselves as foreign policy and international affairs problems. Over the past years, the center has conducted research and hosted several round-table discussions on AMR. Chatham House has particularly focused on the debate about global collective action on AMR and the need for novel business models in drug research and development. In a recent Chatham House report the authors concluded that any proposed solution must overcome inadequate market incentives for research and development, conservation and global access.²³ Antibiotic delinkage business models are identified as offering the most promising avenue for a sustainable, global approach to drug development.

World Economic Forum (WEF)

Category: Policy Institutes and Think Tanks | Global

Focus: H, A, E

Location: Davos, Switzerland

Website: <http://www3.weforum.org/docs/Media/TheGlobalRisksReport2016.pdf>

About:

The World Economic Forum (WEF) is a not-for-profit foundation, which was set up in 1971, and brings together political and business leaders at annual conferences. The WEF's work includes a number of projects and activities related to health care, including future health threats and the development of resilient healthcare systems.

²³ Chatham House (2015) *Towards a New Global Business Model: Delinking Revenues from Sales*, <https://www.chathamhouse.org/publication/towards-new-global-business-model-antibiotics-delinking-revenues-sales>

AMR-related activities:

Since 2012, the WEF has continually highlighted AMR as a global health risk in its annual risk reports²⁴ and has discussed the implications of drug resistance on health security.²⁵ In its reports, the WEF identifies AMR as one of the greatest risks to economic development and global health, and the issue has been discussed in dedicated sessions at the annual WEF meeting in Davos over the past years. The WEF has announced that one of its future projects will focus on ways to manage the risk and impact of future epidemics, which will also examine how public-private partnerships can be used to avoid or mitigate infectious disease outbreaks.²⁶

²⁴ WEF (2016) *Global Risks 2016*, <http://www.weforum.org/reports/the-global-risks-report-2016>

²⁵ WEF (2013) *Global Risks 2013*, http://www3.weforum.org/docs/WEF_GlobalRisks_Report_2013.pdf

²⁶ For a press release of the announcement see <http://www.weforum.org/press/2016/01/preparing-for-the-next-pandemic-fear-cannot-be-our-motivation>

Advocacy

ReAct - Action on Antibiotic Resistance

Category: Advocacy | Global

Focus: H, A

Location: Network with offices in Sweden; Kenya, Ecuador, US

Website: <http://www.reactgroup.org/>

About:

ReAct is a global network with nodes located on five continents and has taken both regional and global approaches to mobilize policy action on antibiotic resistance. ReAct's strategy has been to raise awareness on antibiotic resistance to a range of constituencies, develop networks with interested parties, and move forward towards developing national policy platforms with social mobilization in selected countries.

AMR-related activities:

ReAct's work can be divided into the following areas:

- Develop and advocate national/regional policy solutions to address the challenge of antibiotic resistance
- Increase visibility of ABR in the global health dialogue together with global and local stakeholders
- Identify, develop and seed innovative solutions for R&D of new antibiotics and diagnostics
- Initiate debate about the need for rational use, affordable drug pricing and equitable access to antibiotics
- Gather and disseminate evidence and best practices for managing ABR, especially through the ReAct Toolbox, a freely accessible online resource²⁷
- Develop local training and education programs on ABR and assist with their implementation

²⁷ ReAct (2016) Toolbox, <http://www.reactgroup.org/toolbox/>

Antibiotic Resistance Coalition (ARC)

Category: Advocacy | Global

Focus: H, A, E

Location: N/A

Website: <http://abrdeclaration.org/>

About:

ARC is a coalition of 25 CSOs and stakeholders from six different continents working across health, agriculture, consumer, and development sectors. The coalition was formed to give voice to civil society and foster intersectoral dialogue on AMR. The organizations within ARC are signatories to the ARC Declaration, committing the organizations towards policy change and action to comprehensively address the challenge of AMR across policy sectors.²⁸ Through a process shepherded by ReAct - Action on Antibiotic Resistance, the coalition was established in May 2014 when 20 leading CSOs signed onto the ARC Declaration. The Declaration was then debuted at the World Health Assembly that year.

ARC was instrumental in driving forward the WHO-NGO Dialogue on Antimicrobial Resistance in April 2015 preceding discussions around the adoption of the Global Action Plan on AMR at the 68th World Health Assembly. At invitation of the WHO, over 20 CSOs joined the WHO-NGO Dialogue. The aim of this discussion was for WHO to hear the views of non-governmental and civil society organizations on the implications of adoption of the Global Action Plan on AMR, particularly with regard to implementation by countries and others. A subsequent WHO-NGO Dialogue is planned for April 2016.

South Centre

Category: Advocacy | Global

Location: Geneva, Switzerland

Focus: H, A, E

Website: <http://www.southcentre.int>

About:

The South Centre is an intergovernmental organization of developing countries, which was set up in 1995. The Centre assists its 52 member countries in promoting their interests internationally. Through research policy analysis and technical advice, the South Centre helps member states to formulate and promote shared interests. The South Centre is financed through donations from member states and works on a broad range of policy topics that encompass, among other topics, trade agreements, sustainable environmental policy, social development and global governance.

²⁸ ARC Declaration (2014) <http://www.reactgroup.org/uploads/ARC-declaration/ARC-declaration-May-22-2014.pdf>

AMR-related activities:

The South Centre is a member of the Antibiotic Resistance Coalition and has been an active participant of the WHO-NGO dialogue as a part of the consultations leading up to the adoption of the Global Action Plan on AMR in 2015. While the South Centre does not have a dedicated AMR workstream, it works on a number of issues related to AMR. Under the umbrella of their Social Development program, the South Centre addresses a number of health-related topics that particularly affect LMICs, including access to medicines and intellectual property law and the double-burden of communicable and non-communicable diseases.

Third World Network (TWN)

Category: Advocacy | Global

Location: Penang, Malaysia and Geneva, Switzerland

Focus: H

Website: <http://www.twn.my/>

About:

TWN is an independent, not-for profit international network, which works on issues related to development and global North-South relations. TWN was founded in 1981 and has since worked on a broad range of topic, including international trade and property rights, UN reform, health and sustainable development.

AMR-related activities:

TWN has worked extensively on issues related to drug pricing and access to medicines, including antibiotics in LMICs. Moreover, the network has been involved in research projects on antibiotic use and AMR.²⁹ TWN is a member of the Antibiotic Resistance Coalition.

²⁹ HAI, TWN (2013), 'Antibiotic Use and Antibiotic Resistance in Food Animals in Malaysia: A Threat to Human And Animal Health', <http://www.haiasiapacific.org/wp-content/uploads/2014/06/Memo-on-Antibiotics-in-animal-feeds-the-case-for-Malaysia-21-Nov-2013-V1.pdf>

Centre for Disease Dynamics, Economics and Policy (CDDEP)

Category: Advocacy | Global

Location: Washington, DC, USA & New Delhi, India

Focus: H, A, E

Website: <http://www.cddep.org>

About:

Founded in 2009, the Centre for Disease Dynamics, Economics and Policy (CDDEP) is a research and advocacy organization, which works on a range of public health threats, including antimicrobial resistance, pandemic influenza, malaria and alcohol and tobacco control.

AMR-related activities:

CDDEP initiated the Global Antibiotic Resistance Partnership (GARP), which was started in 2009 to create a platform for developing policy proposals on antibiotic resistance in LMICs.³⁰ GARP's work initially focused on four countries: India, Kenya, South Africa and Vietnam. It has since been expanded to include Mozambique, Nepal, Tanzania and Uganda. In collaboration with these countries, GARP has conducted national situation analyses focusing on antibiotic resistance and use, and developed recommendations on how to address the resistance situation in each country.³¹

CDDEP has also published assessments of the global AMR situation, most recently in 2015, when the organization presented their report 'The State of the World's Antibiotics 2015'.³² Simultaneously, CDDEP released their Resistance Map, a web-based tool for visualization of antibiotic use and AMR trends in different countries.³³

Alliance for the Prudent Use of Antibiotics (APUA)

Category: Advocacy | Global

Location: Boston, MA, USA

Focus: H, A

Website: <http://www.tufts.edu/med/apua/>

About:

The Alliance for the Prudent Use of Antibiotics (APUA) is a US-based non-governmental organization that works to preserve the effectiveness of antimicrobial drugs. APUA was founded

³⁰ CDDEP (2015), *Global Antibiotic Resistance Partnership* <http://www.cddep.org/projects/global-antibiotic-resistance-partnership>

³¹ For an overview of GARP's country situation analyses, see <http://www.cddep.org/garp/home>

³² CDDEP (2015), 'The State of the World's Antibiotics' http://www.cddep.org/publications/state_worlds_antibiotics_2015#sthash.UcZwCg7q.dpbs

³³ CDDEP (2015) *Resistance Map* <http://resistancemap.cddep.org>

in 1981 and has conducted national and international research and educational projects to control and monitor antibiotic resistance. The alliance accepts funding from public and private sector donors, including the pharmaceutical industry.

AMR-related activities:

APUA conducts research, education and advocacy programs to control antimicrobial resistance and ensure access to effective antibiotics. Through its network and research base at Tufts University, APUA has been involved in a wide range of projects, from microbiological research to policy development and economic cost studies of AMR.³⁴ The organization embraces a 'One Health' perspective and has also conducted work on the veterinary use of antibiotics. APUA has been particularly involved in US policy making and, among other things, has been an advocate for the Infectious Disease Society of America's "10'20" initiative to develop ten new antibiotics by 2020.

Médecins Sans Frontières (MSF) Access Campaign

Category: Advocacy | Global

Focus: H

Location: Geneva, Switzerland

Website: www.msfaccess.org

About:

MSF is an international not-for-profit humanitarian aid organization. Founded in France in 1971, the organization provides medical aid in more than 70 countries. In 1999, MSF launched the Access Campaign, to highlight the need for improved access to essential medicines, diagnostics tests and vaccines in LMICs. The Access Campaign's activities are currently focused on six medical challenges: HIV/AIDS, tuberculosis, malnutrition, malaria, vaccines and neglected diseases.

AMR-related activities:

Through its access campaign, MSF has frequently raised the issue of AMR and pushed for policy development in relation to improved access and greater emphasis on innovation.

At the global policy level, MSF has been actively involved in the debate about new diagnostics and the development of new antibiotics. A September 2015 meeting in Geneva convened by WHO, ReAct, MSF Access Campaign and FIND gathered more than 50 biomarker scientists, policy-makers and industry developers to explore the use of biomarkers to create a test to distinguish between bacterial and non-bacterial causes of fever.

³⁴ For a more comprehensive overview of APUA's activities see http://www.tufts.edu/med/apua/about_us/what_we_do.shtml

In addition to the Access Campaign's work, MSF has raised the issue of AMR in other policy forums, for instance at a conference in Jordan in 2014, which brought together experts to discuss the effect of AMR in the Middle East.³⁵

Health Action International (HAI)

Category: Advocacy | Global

Focus: H

Location: Amsterdam, The Netherlands

Website: <http://haiweb.org/>

About:

HAI is a non-governmental organization that works globally to improve access to essential medicines. Through a network of international partners, HAI collects data and conducts research in more than 70 countries. The organization's work focuses on:

- mapping the availability and affordability of medicines, as well as pharmaceutical marketing
- develop policy recommendations for policies on medicines access and use
- publicising poor business practices that threaten proper medicine use and affordable access
- raising awareness for the issue of access to medicines and rational use
- building expert capacity of civil society organizations in developing countries

AMR-related activities:

HAI has been working extensively on access to medicines, including antibiotics, in LMICs. In the past, HAI has worked with WHO on mapping the prices and availability of drugs and co-authored a manual for national drug price surveys.³⁶ HAI has also conducted research on alternative business models for pharmaceutical innovation, including research into novel antibiotics. In addition, HAI is one of the founding members of the Antibiotic Resistance Coalition.

³⁵ See <http://www.msf-me.org/en/news/news-media/news-press-releases/msf-conference-in-jordan-experts-recommend-a-series-of-steps-to-tackle-the-issue-of-antibiotic-resis.html>

³⁶ http://www.who.int/medicines/areas/access/Medicine_Prices_and_Availability/en/

World Alliance Against Antibiotic Resistance (WAAAR)

Category: Advocacy | Global

Focus: H, A, E

Location: Paris, France

Website and Declaration:

<http://www.waaar.org/>

About:

WAAAR was formed as a NGO in 2012 by 350 professionals from clinical, veterinary, and environmental backgrounds to raise awareness for AMR. Embracing a 'One Health' approach, WAAAR has stressed the need for a cross-sectoral and global response. In the organization's Paris Declaration from 2014, WAAAR calls for a holistic policy response and outlines ten suggestions for action, including improved awareness and education, better diagnostics, new drug development models and better stewardship and infectious disease control measures. In addition, WAAAR has called on UNESCO to recognize the concept of antibiotics as an 'intangible cultural heritage'. WAAAR has been particularly active in France, where many of its members are based.

Consumers International

Category: Advocacy | Global

Focus: H, A

Location: London, United Kingdom

Website: <http://www.consumersinternational.org/our-work/food/key-projects/antibiotics/>

About:

Consumers International (CI) is the world federation of consumer groups, which advocates for consumer rights. CI is active in around 120 countries with more than 240 member organizations. The organization's work encompasses a broad range of consumer-related issues, ranging from financial service regulation to food safety. CI engages industry and policy makers to push for better protection of consumer rights and to protect consumer interest.

AMR-related activities:

As part of their work on food, CI has launched the "*Campaign to get Antibiotics off the Menu*". The campaign aims to raise awareness about the routine use of antibiotics in livestock and agriculture as growth promoters and for metaphylaxis, and outlines the risks of widespread antibiotic use in farming. CI also targets food producers, especially fast food chains, to demand a cut in the use of antibiotics in their meat supply. In 2014, CI published a set of

recommendations to reduce the use of antibiotics in farm animals, which called for globally coordinated and intersectoral efforts to address AMR³⁷.

CI has also announced that the topic for the World Consumer Rights Day 2016 (March 15) will be “Antibiotics off the menu”³⁸. As part of this initiative, CI will be campaigning globally for fast food companies to commit to stopping the sale of meat raised with the routine use of antibiotics that are important to human medicine.

³⁷ CI (2014) *Antibiotics in farming - CI recommendations*, <http://www.consumersinternational.org/news-and-media/resource-zone/antibiotics-policy-position/>

³⁸ CI (2016) *WCRD 2016 - Antibiotic Resistance*, <http://www.consumersinternational.org/our-work/wcrd/wcrd-2016/>

Innovation & Research

Global Antibiotic Research and Development (GARD) Partnership Incubation (formerly known as WHO-DNDi Collaboration)

Category: Innovation | Global

Location: Geneva, Switzerland

Website: http://www.who.int/phi/implementation/consultation_imnadb/en/

Focus: H

About:

As a follow up to the WHO Technical Consultation on Innovative Models for New Antibiotics' Development and Preservation that took place in May 2014, WHO and DNDi have developed a proposal for a "Global Antibiotic Research and Development Facility to promote research, responsible use, and access to new antibiotics".³⁹ The proposal focuses on the development of new drugs, but places a strong emphasis on improved access to drugs and the conservation of the effectiveness of existing antibiotics. Furthermore, it advocates for the prioritization of developing medicines and medical devices that can also be used in resource-limited settings. GARD is intended to become a fully independent organization within the next two years and will work towards the fulfillment of the following objectives:

- address the specific needs of low- and middle-income countries in relation to medical products that are not being developed due to a lack of profitability
- pilot the use of alternative incentive models that support conservation of and access to new antibiotics
- ensure the affordability of new antibiotics

Institut Pasteur

Category: Innovation and Research | Global

Focus: H

Location: Paris, France

Website: <http://www.pasteur.fr/en>

Budget: €280 million (2013)

³⁹ For a concept note on the organization of GARD, see http://www.dndi.org/wp-content/uploads/2016/02/Global_Antibiotic_RD.pdf

About:

The Institute Pasteur is a private non-profit foundation with research in infectious diseases, prevention and treatment. With headquarters in France, the Institute Pasteur has research institutes in 32 countries, and is host to 130 research units, which work on a wide range of diseases. In addition, the Institute Pasteur hosts 16 National Reference Centers and 9 WHO Collaborating Centers.

AMR-related activities:

Many of the Institute's research groups conduct work in the field of AMR and antibiotics. This covers a broad spectrum of topics, from basic research in microbiology to epidemiology, biostatistics and pharmacology. In 2014 the Institute announced a call for application for a new research unit dedicated specifically to antibiotic resistance.

Foundation for Innovative New Diagnostics (FIND)

Category: Innovation and Research | Global

Focus: H

Location: Headquarters in Geneva, Switzerland

Website: <http://www.finddiagnostics.org/>

About:

FIND is an NGO based in Geneva that works towards overcoming development gaps for new diagnostic tools. FIND works together with the international research community, the public sector and partners in industry. Their network includes well-established partnerships with international organizations, such as WHO and national governments and aid organizations. FIND works primarily on syndrome-based approaches to diagnostics, which help health care workers identify causes of conditions such as coughs or fever. FIND's work falls into four categories:

1. catalyzing development of new diagnostics
2. accelerating access to diagnostic technology
3. guiding product development from clinical trials to global implementation
4. promoting the need for new diagnostics and advocating for their usefulness

FIND works with a number of core programs, including TB, Malaria, Ebola, Respiratory Tract Infections (RTIs), Hepatitis C, acute febrile syndrome and neglected tropical diseases.

AMR-related activities:

AMR is identified as a cross-cutting theme in FIND's programs. FIND currently addresses AMR by developing diagnostic tests that can identify the causative agent of common symptoms, such as fever or coughs, with the aim to reduce overuse and misuse of antibiotics.

FIND convened an expert meeting in 2015 with WHO, MSF and ReAct on biomarkers to discriminate bacterial from other infectious causes of acute fever.⁴⁰

Community for Open Antimicrobial Drug Discovery (CO-ADD)

Category: Research | Global

Website: <http://www.co-add.org>

Focus: H

Location: University of Queensland, Australia

About:

CO-ADD is a not-for-profit initiative led by academics at The University of Queensland. Their goal is to screen compounds from academic research groups around the world for free. CO-ADD's aim to assist researchers around the world in identifying new compounds against multi-resistant pathogens. The project is supported by the Wellcome Trust.

⁴⁰ Meeting Report FIND, MSF, ReAct (2015) http://www.finddiagnostics.org/resource-centre/reports_brochures/fever-biomarker-report.html

Surveillance

World Health Organization

GLASS

Category: Surveillance | Global

Focus: H

Location: WHO Headquarters, Geneva

Website: <http://www.who.int/drugresistance/surveillance/en/>

About: The Global Antimicrobial Resistance Surveillance System (GLASS) was introduced in 2015 as part of the strategic target of establishing global surveillance and monitoring capacity for AMR, and a manual for early stage implementation has been published.⁴¹

GLASS will be rolled out incrementally over the coming years and harmonize surveillance and reporting standards in WHO member states. WHO aims for enrollment of 40 percent of its member countries by 2019. Collected data will provide the evidence base for future action and advocacy. In the medium run, it is envisioned that GLASS will facilitate a switch from a case-finding approach based on specimens for priority specimens to a syndromic surveillance approach, which would allow for the calculation of the incidence of drug-resistant infections.

WHO Advisory Group on Integrated Surveillance of AMR (AGISAR)

Category: Surveillance | Global

Focus: H, A

Location: n/a

Website: <http://www.agisar.org/>

About:

Established in 2008, AGISAR is an expert group that supports WHO's efforts to reduce the public health impact of AMR that is associated with the use of antimicrobials in food animals.

Through publications and expert advice, the AGISAR provides WHO member states with advice on the development of an integrated surveillance system for AMR across both the human and veterinary sector. AGISAR has more than 30 expert members from different professional

⁴¹ WHO (2015) 'Global Antimicrobial Resistance Surveillance System: Manual for Early Implementation' http://apps.who.int/iris/bitstream/10665/188783/1/9789241549400_eng.pdf?ua=1

backgrounds, which are appointed for a six-year term (current members will serve from 2014-2019).

The AGISAR meets annually and at the 2015 meeting, its activities were formally aligned with the Global Action Plan (GAP). The AGISAR supports WHO in the implementation of the GAP, especially in relation to the GAP's objectives number 2 (Strengthening the knowledge and evidence base through surveillance and research) and 4 (Optimizing the use of antimicrobial medicines in human and animal health). In supporting the GAP, the AGISAR's work focuses on four key areas:

1. Support WHO activities on the containment of AMR from the food chain
2. Support WHO in capacity building and offer advice on the establishment of integrated surveillance systems for AMR and antimicrobial use
3. Review WHO's list of critically important antibiotics (from 2015 this will be done every five years)
4. Support WHO in the implementation of Tripartite activities and Codex Alimentarius activities on AMR

GASP (The Gonococcal Antimicrobial Surveillance Program)

Category: Surveillance | Global

Focus: H

Location: Worldwide network

Website: http://www.who.int/reproductivehealth/topics/rtis/gonococcal_resistance/en/

About:

GASP is a global network of laboratories for the collection of data on antimicrobial susceptibility of gonorrhoea in participating countries. GASP has focal points in all WHO regions, which collect data from around 70 participating countries in collaboration with the WHO's regional offices.

The GASP networks were initially set up in the WHO WPRO and American Regions in the 1990s. Throughout 2000-2012, GASP was extended to cover all other WHO regions, due to the continued spread of drug-resistant *N. gonorrhoeae*. The GASP pursues three goals:

1. To conduct sentinel AMR surveillance to inform treatment guidelines
2. To establish a strategy to rapidly detect patients with gonococcal infections, who experience treatment failure with recommended cephalosporin therapy
3. To ensure the effective clinical management of infected patients and their sexual partners

GASP is also an integral part of the *Global Action Plan to control the spread and impact of antimicrobial resistance in Neisseria gonorrhoeae*.⁴² Participating countries report susceptibility data to regional focal points and the data is regularly published to inform policy making.

⁴² WHO (2012) *Global Action Plan to control the spread and impact of antimicrobial resistance in Neisseria gonorrhoeae*, <http://www.who.int/reproductivehealth/publications/rtis/9789241503501/en/>

Funding

Wellcome Trust

Category: Funding | Global

Focus: H

Location: Headquarters in London, UK

Website: <http://www.wellcome.ac.uk/>

Budget: The Trust has an endowment of GBP 18 billion and pays out around GBP 700 million per year. The proportion spent on projects related to AMR varies each year.

About: The Wellcome Trust is an independent charitable foundation, dedicated to improving health through science, research and societal engagement. It is the largest non-governmental donor for biomedical research in the UK. The Wellcome Trust has engaged with AMR on a number of levels. It regularly hosts meetings and conferences on AMR, and funds research into AMR-related issues. The Wellcome Trust funds research projects across a broad range of academic disciplines, broadly divided into 5 categories:

1. **Biomedical Science:** Awards for researchers or research teams. Activities include laboratory-based work, field projects, support for medical trials and technology development
2. **Innovations:** Awards for translational research, seed funding for drug development and start grants for innovative research projects
3. **Public Engagement:** Awards for community outreach and dissemination of research findings
4. **Humanities and Social Science:** Investigator awards for social science research, covering a broad range of topics, from empirical to normative research
5. **Strategic Funding:** Major research grants in areas judged to be of strategic importance. Currently funded research focuses on environment and health, research in humanitarian crises and health system strengthening

Funded projects are mostly located in the UK, however around 10 percent of research is carried out overseas.

AMR-related activities:

The Wellcome Trust has identified drug resistance as a spotlight issue, and funds a number of initiatives and projects in this area. Of particular note are:

- **Public Perspectives on AMR:** The Wellcome Trust commissions research into public perceptions and public understanding of antibiotics and antibiotic use.
- The Wellcome Trust hosts the team of *The Review on Antimicrobial Resistance*
- **Basic research funding:** The Wellcome Trust has provided grants and awards to investigators for a number of microbiological projects related to the development of new antibiotics or innovative treatments.

- Coordination and administration of major research grants: The Wellcome Trust is involved in the coordination of major research grants in the field of AMR, including the Longitude Prize, and the forthcoming Fleming Fund.

Fleming Fund

Category: Funding | Global

Focus: H

Location: Department of Health, UK

Website: As of yet there is no dedicated website for the Fleming Fund. For its announcement see <http://www.wellcome.ac.uk/News/Media-office/Press-releases/2015/WTP058933.htm>

Budget: £195 million

About:

In March 2015, the UK government announced the launch of the Fleming Fund, endowed with £195 million. In its new strategy 'UK Aid: Tackling global challenges in the national interest', the Department for International Development announced that the UK government would invest an additional £70 million into the fund as part of its AMR strategy. The fund was launched as a response to the AMR Review's initial recommendations and will focus on building laboratory capacity and surveillance networks in LMICs in order to improve global surveillance of AMR. The Fleming Fund will operate over the next five years. During the 2015 World Health Assembly, the UK announced that £3 million of the Fleming Fund's endowment would be given to WHO to accelerate the implementation of the GAP.

The Ross Fund

Category: Funding | Global

Focus: H

Location: tbd

Budget: £1 billion

About:

In November 2015, the UK government announced the launch of the Ross fund in collaboration with the Bill & Melinda Gates Foundation. The fund's resources will be used to fight Malaria and other infectious diseases, but it has been announced that resources will also be dedicated to projects that target diseases with epidemic potential, neglected tropical diseases and diseases with emerging resistance. While a detailed breakdown of the fund's anticipated activities is not yet available, it has been announced that £100 million will be used for research into infectious

diseases and £115 million will be dedicated to the development of new drugs and diagnostics for diseases such as TB and malaria.⁴³ At this point, no details about the organization of the fund or a timeline for its implementation have been released.

Longitude prize

Category: Funding | Global

Focus: H

Location: Hosted at Nesta, London, UK

Website: <https://longitudeprize.org>

Budget: Prize of £10 million

About:

The Longitude Prize was launched in 2014 with the aim of identifying new point-of-care diagnostics that will help to conserve antibiotics. Submissions must meet minimum criteria of accuracy, affordability and usability and must be deployable worldwide. Submissions are reviewed in a multi-stage process by a panel of experts. Until the end of 2015, 12 submissions were evaluated, however none of them have been able to move past the first round of evaluation.

Horizon Prize

Category: Funding | Global

Focus: H

Location: Brussels

Website: <http://ec.europa.eu/research/horizonprize/index.cfm?prize=better-use-antibiotics>

Budget: Prize of €1 million

About:

The European Commission (EC) launched the Horizon Prize for better use of antibiotics in 2015. It will be awarded for the development of a rapid point-of-care test to determine whether patients with upper-respiratory tract infections require antibiotics. The prize is open until August 17 2016 to participants in EU countries, or in countries affiliated with the EC's Horizon 2020 program.

⁴³ For the UK government's press release see: <https://www.gov.uk/government/news/chancellor-george-osborne-and-bill-gates-to-join-forces-to-end-malaria>

National Institutes of Health / National Institute of Allergy and Infectious Diseases

Category: Funding | Global

Focus: H

Location: Bethesda, Maryland, US

Website: <https://www.niaid.nih.gov/topics/antimicrobialresistance/>

AMR strategy:

<https://www.niaid.nih.gov/topics/antimicrobialResistance/documents/arstrategicplan2014.pdf>

Funding: The total NIAID budget for 2016 is \$4.6 billion. AMR is covered under different parts of NIAID's budget, including research grants, drug development and biodefense.

About: The NIAID is one of the 27 institutes of the US National Institutes of Health (NIH) and conducts basic and applied research into infectious, immunologic and allergic diseases. Its research portfolio includes work on biodefense and emerging infectious diseases, vaccine development and research into infectious diseases and immune system responses.

AMR-related activities:

AMR (including antiviral resistance) is a key aspect of NIAID's work and is included in many of the institute's research fields. Broadly, NIAID's activity in the field of AMR comprises the following:

- Basic research into resistance mechanisms
- Development of new rapid diagnostic technology
- Support of clinical trials of new antibiotics or new applications of existing drugs
- Support for researchers and companies that develop new antimicrobials

One of the key activities of NIAID lies in supporting basic research into the mechanisms of resistance. This includes work on priority pathogens, such as MRSA and *E. coli* and the analysis of microbial genomes as part of a strategy to identify novel target sites for new antibiotics. NIAID also works on the translation of basic research insights into clinical practice, by issuing guidelines on appropriate use and dosing of antibiotics, and by issuing prevention strategies for the emergence of AMR. Finally, NIAID has significant laboratory capacity for research, diagnosis and surveillance of AMR.

To assist with the identification and prioritization of the most pressing research issues, NIAID established the Antibiotic Resistance Leadership Group (ARLG), which is based at Duke University. The ARLG develops, designs, implements, and manages a clinical research agenda to increase knowledge of AMR.⁴⁴

⁴⁴ For more information on the ARLG, see <http://arlg.org/>

UK-China Antimicrobial Resistance Initiative

Category: Funding | Global

Focus: H, A

Location: n/a

Budget: UK contribution £4.5 million, Chinese contribution: up to CNY 3 million per project

Website: <https://www.mrc.ac.uk/funding/browse/uk-china-amr-partnership-initiative/>

About:

The UK-China AMR initiative is a bilateral agreement to fund collaborative research projects to address AMR, in the veterinary and clinical sector in China. The initiative is managed by the three UK councils, namely the Biotechnology and Biological Sciences Research Council (BBSRC), the Medical Research Council (MRC), the Economic and Social Research Council (ESRC), and one Chinese partner, the National Natural Science Foundation of China (NSFC). The UK contribution is provided via the Newton Fund. The Newton Fund is a £ 375 million initiative by the UK government to promote economic development and welfare in 15 partner countries.⁴⁵ The UK-China AMR initiative was announced as part of a joint declaration of the two heads of state, following a Chinese state visit to the UK in October 2015.⁴⁶

Proposals for projects are accepted from January until March 2016. The initiative will fund research projects with a budget of up to £1 million, which focus on the following areas:

1. Understanding development, epidemiology and inter-species transmission dynamics of AMR
2. Developing new drugs and/or new diagnostics to appropriately treat bacterial infections
3. Understanding behavior that contributes to the emergence of AMR in the clinical and veterinary sector
4. Understanding how health systems can best structure the supply chain for antibiotics

⁴⁵ <http://www.newtonfund.ac.uk/about/>

⁴⁶ The full declaration is available at <http://china.cctv-america.com/2015/10/22/full-text-of-china-uk-joint-declaration/>

Regional Stakeholders and Initiatives

Policy

European Region

European Commission

Category: Policy | Regional - Europe

Focus: H, A

Location: Brussels, Belgium

Website: http://ec.europa.eu/dgs/health_food-safety/amr/index_en.htm

About:

The EU Commission adopted their 5-year Action Plan on AMR in 2011. It contains 12 actions for implementation with EU member countries and identifies 7 areas where measures are most necessary:

- Appropriate use of antimicrobials
- Preventing microbial infections and their spread
- Developing new effective antimicrobials or alternatives for treatment
- Cooperating with international partners to contain the risk of AMR
- Improving monitoring and surveillance in human and animal medicine
- Promoting research and innovation
- Improving communication, education and training

The EC has compiled a detailed overview of the 12 actions covered by the action plan in a roadmap, including operational objectives, concrete activities and deadlines.⁴⁷

A progress report on the AMR Action Plan was published in February 2015 and a complete evaluation of the initiative is currently ongoing.⁴⁸ A new action plan is expected to be developed later in 2016.

In 2014, the EC introduced joint procurement as a preventative tool for better preparedness of Member States to an outbreak of any cross-border health threat. The scope of this legislative tool spans from pandemic preparedness to antimicrobial resistance, allowing member states to engage in a joint procurement procedure to purchase medical countermeasures, including antibiotics.⁴⁹

⁴⁷ EC (2015) Action Plan Against the rising threats from Antimicrobial Resistance: Road Map, http://ec.europa.eu/health/antimicrobial_resistance/docs/roadmap_amr_en.pdf

⁴⁸ EC (2015) Progress report on the Action plan against the rising threats from Antimicrobial Resistance, http://ec.europa.eu/health/antimicrobial_resistance/docs/2015_amr_progress_report_en.pdf

⁴⁹ European Commission (2015) Joint procurement on medical countermeasures, http://ec.europa.eu/health/preparedness_response/joint_procurement/index_en.htm

European Parliament

Category: Policy | Regional - Europe

Location: Brussels, Belgium

Website: <http://www.europarl.europa.eu/portal/en>

Focus: H, A,

About:

The European Parliament (EP) is the directly elected parliamentary institution of the European Union and one of its three legislative bodies.

AMR-related activities:

The Netherlands will hold the EU presidency from January to June 2016 and have selected AMR as one of the key issues of the presidency.⁵⁰ Over the past years, the EP has already undertaken a number of steps to address AMR. These include:

A resolution on AMR:

In July 2015, the EP adopted an own-initiative report to improve patient safety and combat AMR in Europe.⁵¹ The resolution includes recommendations for both human and non-human use of antibiotics.

New EU Animal Health Legislation:

In June 2015 the EP and the EC reached a political agreement on a proposed new animal health law, which is currently undergoing procedural steps before publication. Two additional legal proposals on veterinary medical products and medicated feed are currently pending.⁵²

European Medicines Agency (EMA)

Category: Policy | Regional – Europe

Focus: H, A

Location: London, United Kingdom

Website: <http://www.ema.europa.eu/>

⁵⁰ Program for the Ministerial EU-Conference on Antimicrobial Resistance (2016), <http://english.eu2016.nl/documents/publications/2016/02/10/programme-ministerial-eu-conference-on-antimicrobial-resistance>

⁵¹ European Parliament resolution of 19 May 2015 on safer healthcare in Europe: improving patient safety and fighting antimicrobial resistance, <http://www.europarl.europa.eu/sides/getDoc.do?type=TA&reference=P8-TA-2015-0197&language=EN&ring=A8-2015-0142>

⁵² Regulation of the EP and of the council on the manufacture, placing on the market and use of medicated feed and repealing Council Directive 90/167/EEC, <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52014PC0556>

About:

The European Medicines Agency (EMA) is an agency of the European Union. Founded in 1985, the agency is responsible for the scientific evaluation, supervision and safety monitoring of medicines developed by pharmaceutical companies for use in the EU.

AMR-related activities:

EMA has been actively involved in the European policy response to AMR on a number of levels. To increase the speed of drug development, EMA has issued guidance to pharmaceutical companies for the development of antibiotics, including advice on risk-benefit assessment, clinical testing and streamlining of market authorization.⁵³

EMA has also worked extensively on reducing the veterinary use of antibiotics. The agency set up and runs the network for the European Surveillance of Veterinary Antimicrobial Consumption (ESVAC), which covers antibiotic use for around 95% of farm animals in 26 countries in the EEA.

The EMA has provided scientific advice on the impact of AMR on animal and human health to the European Commission, and in 2013 the agency formed the Antimicrobial Advice Ad Hoc Expert Group (AMEG). The AMEG has provided expert opinion on the impact that the veterinary use of antibiotics has on public health. The EMA has issued scientific advice on the use of specific antibiotics in animals, as well as strategies to reduce the need for antibiotic use in animal husbandry.⁵⁴ The EMA is also engaged in TATFAR.

European Food Safety Agency

Category: Policy | Regional - Europe

Location: Parma, Italy

Website: <http://www.efsa.europa.eu/en/topics/topic/amr>

Focus: A, E

About:

EFSA is an agency of the European Union and offers independent scientific advice on existing and emerging risks along the food chain.

AMR-related activities:

EFSA provides scientific support and advice to risk managers on the risks to human and animal health related to the possible emergence, spread and transfer of AMR in the food chain and in animal populations.

⁵³ See http://www.ema.europa.eu/ema/index.jsp?curl=pages/special_topics/general/general_content_000439.jsp

⁵⁴ For an overview of EMA's recent publications on veterinary use of antibiotics and AMR, see http://www.ema.europa.eu/ema/index.jsp?curl=pages/regulation/general/general_content_000639.jsp&mid=WC0b01ac058080a585

In its work, EFSA cooperates closely with other EU agencies such as the European Centre for Disease Prevention and Control (ECDC) and the European Medicines Agency (EMA).

- *Monitoring and analysis of AMR in the food chain:*
The agency's work on AMR focuses mostly on monitoring and analyzing the situation on AMR in food and animals across Europe. EFSA also operates a task force on zoonoses data collection. Based on data collected by the EU Member States, EFSA and ECDC produce annual reports on zoonotic infections, food-borne outbreaks and AMR in Europe.⁵⁵ Additionally, EFSA consults with national authorities regarding their monitoring and reporting activities.
- *Risk assessments and recommendations:*
EFSA's scientific panel conducts AMR risk assessment and provides scientific consultations on control options. EFSA, ECDC, EMA and the European Commission's Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) have also published a joint scientific opinion on antimicrobial resistance focused on zoonotic infections.⁵⁶

Nordic Council

Category: Policy | Regional – Europe

Focus: H, A

Location: Copenhagen, Denmark

Website: <http://www.norden.org/en>

About:

The Nordic Council of Ministers is the official body for Nordic intergovernmental co-operation. Member states include Denmark, Sweden, Norway, Finland and Iceland. The Nordic Council of Ministers works across a broad range of policy issues, including health and agriculture.

AMR-related activities:

The Nordic Council of Ministers has repeatedly voiced concern over the emergence of AMR over the past years and has held a number of meetings and conferences on the issue. In 2014, the council published a report on how to develop health cooperation in the region, which included AMR-specific suggestions.⁵⁷

In September 2015, the Council adopted a resolution calling for a 'One Health' approach to AMR in the Nordic region and calls for the establishment of a strategic group of senior officials to exchange national experiences and advise the region on how the Nordic region can support

⁵⁵ For EFSA's most recent report, see <http://www.efsa.europa.eu/en/press/news/160211>

⁵⁶ EFSA et al (2009), 'Joint Opinion on AMR focused on zoonotic infections' <http://www.efsa.europa.eu/en/efsajournal/pub/1372>

⁵⁷ Bo Könberg (2014) 'The Future Nordic Co-operation on Health', <http://norden.diva-portal.org/smash/record.jsf?pid=diva2%3A723237&dsid=-5345>

the global fight against AMR. In particular, the declaration calls for support in the following areas:

- Development of national action plans which incorporate the 'One Health' perspective
- Development of guidelines for effective hygiene and prevention mechanisms
- Ensuring prudent use of antimicrobials
- Identification and elimination of economic incentives in all sectors that encourage inappropriate use of antimicrobial agents, and introduction of incentives to optimize use.
- Improving awareness and understanding of AMR.
- Strengthening surveillance of AMR in both clinical and veterinary use

The Nordic Council has not yet announced what resources it will make available for its work on AMR and there is currently no dedicated budget for its activities in this field.

Northern Dimension Partnership in Public Health and Social Well-being

Category: Policy | Regional - Europe

Location: Secretariat in Stockholm, Sweden

Focus: H, A,

Website: http://www.ndphs.org/?amr_tg

About:

The Northern Dimension Partnership in Public Health and Social Well-being (NDPHS) is a cooperative effort of 9 North European governments, the European Commission and eight international organizations. The Partnership's member states are: Estonia, Finland, Germany, Latvia, Lithuania, Norway, Poland, Russia and Sweden. Organizations that are members of NDPHS include a number of Baltic organizations, UNAIDS and the WHO.

AMR-related activities:

In 2010 the NDPHS formed a task force on AMR, which is led by Sweden and Germany. The task force is made up of high-level experts from member states and their work focuses on:

1. Contributing to policy formulation and improving collaboration between member states
2. Surveillance of AMR
3. Providing information to the public about the prudent use of antibiotics

The AMR task force also collaborates across other NDPHS activities in relevant areas, such as prison health and tuberculosis.

In 2015 the NDPHS adopted the declaration ‘From strategies to action – how to tackle the challenges of Antimicrobial Resistance (AMR) in the Northern Dimension area’⁵⁸. In the declaration, members committed, among other things, to collaboration in the field of AMR, better information sharing and a strengthening of intersectoral coordination from a ‘One Health’ perspective.

European Federation of Pharmaceutical Industries and Associations (EFPIA)

Category: Policy | Regional - Europe

Location: Brussels, Belgium

Website: <http://www.efpia.eu>

Focus: H

About:

EFPIA represents the interests of the pharmaceutical industry in Europe. Its members are 39 leading pharmaceutical companies and 33 national associations, which in turn represent around 1,900 companies in the European region.

AMR-related activities

The federation’s main AMR activity is its involvement in the European Innovative Medicines Initiative (IMI) and specifically the “New Drugs for Bad Bugs (ND4BB)” program. Through ND4BB, the IMI has established multiple public private projects spanning from biomedical research to the development of economic models to increase R&D of new antibiotics. The Consortium is detailed in the separate IMI entry under the section *Innovation and Research | Regional - Europe*.

South-East Asian Region

APEC: Strategic action plan to control AMR in the Asia-Pacific Region

Category: Policy | Regional – South-East Asia

Focus: H

Location: n/a – regional strategy document

Website: <http://www.apec.org/Groups/SOM-Steering-Committee-on-Economic-and-Technical-Cooperation/Working-Groups/Health.aspx>

⁵⁸ NDPHS (2015), ‘From strategies to action - how to tackle the challenges of Antimicrobial Resistance in the Northern Dimension area’ http://www.ndphs.org/internalfiles/File/About_NDPHS/NDPHS_Declaration_on_AMR.pdf

About:

The Asia-Pacific Economic Cooperation is a forum for 21 member states along the Pacific rim, which promotes free trade across the Asia-Pacific region. Since 2007, APEC has a dedicated Health Working Group (HWG), which addresses health threats that impact the region, and focuses primarily on communicable diseases and capacity building in its member states.

AMR-related activities:

Following an initial evaluation of AMR strategies in South-East Asia in 2011, the HWG developed a strategic guideline document, which was released in 2014. In this APEC Guideline to Tackle Antimicrobial Resistance in the Asia-Pacific Region⁵⁹, a six-step plan was proposed:

1. Strengthen surveillance capacity for monitoring AMR and antibiotic use
2. Improve awareness of antimicrobial resistance
3. Develop guidelines for the appropriate use of effective antibiotics
4. Strengthen regulation on infection prevention and control
5. Expand vaccination programs
6. Develop comprehensive, multi-sectoral policy and regulation for AMR

⁵⁹ APEC (2014) *Guideline to Tackle Antimicrobial Resistance in the Asia-Pacific Region*, http://publications.apec.org/publication-detail.php?pub_id=1577

Advocacy

African Region

Ecumenical Pharmaceutical Network (EPN)

Category: Advocacy | Regional – Africa

Focus: H

Location: Nairobi, Kenya

Website: <http://www.epnetwork.org/en/>

About:

The Ecumenical Pharmaceutical Network (EPN) is an international network of faith-based organizations that works to improve the quality of pharmaceutical service delivery and the access to essential medicines. Set up in 1981, EPN emerged out of a commission at the World Council of Churches, which provided advice on pharmaceutical services in low and middle income countries, with a focus on Africa.

EPN has more than 100 member organizations in more than 30 countries, across Africa, Europe and South-East Asia. The organization currently has six parallel work streams, including projects on AMR, access to medicines and HIV/AIDS.

AMR-related activities:

In 2008, EPN and other partners, such as ReAct, created a public campaign to raise awareness about the challenge of AMR. Since then, EPN has become one of the leading institutions in Africa to work on AMR and its members have undertaken a number of activities including:

- Sensitization seminars for health professionals in Malawi, Zimbabwe, Tanzania Togo, Kenya, Cameroon and Nigeria.
- Education for children and high school students on rational use of antibiotics in Moldova and India
- Development and distribution of information, education and communication materials on AMR and rational use of antibiotics, targeting different audiences such as health care workers and local communities
- Random testing of antibiotics entering the church health systems in 15 countries to assure the quality of drugs
- Research to investigate knowledge about antibiotic use and antimicrobial resistance in Sierra Leone and Tanzania.

EPN also hosts the African node of ReAct-Action on Antibiotic Resistance at its offices in Nairobi.

European Region

Alliance to Save Our Antibiotics

Category: Advocacy | Regional – Europe

Focus: A

Location: Network of multiple organizations in the UK

Website:

<http://www.sustainweb.org/antibiotics/>

About:

The Alliance to Save Our Antibiotics is a network of organizations that work on ending the overuse of antibiotics in animal farming. The Alliance currently has 34 supporting member organizations, including medical, pharmaceutical, veterinary and patient organizations, as well as consumer groups, animal welfare and agricultural organizations. The Alliance has a UK-focus and has proposed concrete actions to be taken by the UK government.⁶⁰ These include:

1. Setting a target for reducing farm antibiotic use by 50% by 2020 and by 80% by 2025 (including a target to cut the use of critically important antibiotics by 80% by 2020 and 95% by 2025)
2. Banning preventative mass medication in feed or water, except for where disease has been diagnosed
3. Collecting and reporting annual national surveillance data on the human health impacts of antimicrobial resistance

Antibiotic Action

Category: Advocacy | Regional – Europe

Focus: H

Location: Birmingham & London, UK

Website: <http://antibiotic-action.com/>

About:

Antibiotic Action is an independent UK-led global initiative, which is funded by the British Society for Antimicrobial Chemotherapy (BSAC). The initiative organizes campaigns and produces publications to inform and educate the public about AMR and the need for R&D of new treatments. Through its collaboration with BSAC, Antibiotic Action has created an online resource center on AMR, which provides information material about the emergence of AMR, and its relevance for the public and health professionals.

⁶⁰ *The Alliance to Save our Antibiotics (2015) the campaign*, <http://www.soilassociation.org/antibiotics/alliancetosaveourantibioticsthecampaign>

The European Consumer Organisation (BEUC)

Category: Advocacy | Regional – Europe

Focus: H, A

Location: Brussels

Website: <http://www.beuc.eu/can-we-trust-our-meat>

About:

BEUC (Bureau Européen des Unions de Consommateurs) is an international consumer rights organization, which was founded in 1961. BEUC brings together 41 member organization, which come from 31 EU and EEA countries, and works on a broad range of issues related to consumer rights.

AMR-related activities:

BEUC has a dedicated campaign about food safety, which also addresses AMR. The campaign ‘Can We Trust Our Meat?’ informs consumers about food safety and appropriate labeling of meat products. As part of this campaign, BEUC has called for the reduction of antibiotic use in food animals, the phasing out of critically important antibiotics for animal use and the strict enforcement of veterinary prescriptions for all antibiotic use. In 2014, BEUC released a position paper on the use of antibiotics in food animals, in which it outlined a list of key recommendations for reducing antibiotic use in the veterinary sector.⁶¹

⁶¹ BEUC (2014) ‘Antibiotic Use in Livestock: Time to Act’, http://www.beuc.eu/publications/beuc-x-2014-043_pca_beuc_position_paper_on_antibiotic_resistance.pdf

Innovation & Research

European Region

Joint Programming Initiative on AMR (JPIAMR)

Category: Innovation and Research | Regional – Europe

Focus: H, A, E

Location: Coordinated by the Swedish Research Council in Stockholm, Sweden

Website: <http://www.jpiamr.eu/>

About:

The Joint Programming Initiative on Antimicrobial Resistance (JPIAMR) was set up to streamline the European research efforts in AMR by joint planning, implementation and evaluation of national research programs. Because national research agendas are otherwise poorly coordinated, JPIAMR creates a forum for dialogue and joint planning to identify and address gaps in the existing research agenda. JPIAMR is now also including non-European countries.

JPIAMR has identified six priority topics to form its Strategic Research Agenda with a multidimensional approach to tackle the AMR problem.⁶² These are:

- Improving current antibiotics and developing new antibiotics and alternatives to antibiotics
- Developing new and improved diagnostics to reduce inappropriate use of antibiotics
- Developing an international, standardized surveillance program for AMR and antibiotic use in human, and agricultural settings
- Improving the understanding of disease transmission mechanisms
- Assessing the degree of antibiotic pollution of the environment and developing strategies to minimize environmental contamination.
- Evaluating preventative and infection control interventions.

In line with the Strategic Research Agenda, the JPIAMR has conducted two rounds of joint calls until February 2016. The research areas of the first call covered a range of topics, from infection prevention to drug development. The second call focused on new combination therapies and the reintroduction of discontinued antibiotics into the market.⁶³

There are currently 22 participating countries (Argentina, Belgium, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Israel, Italy, Japan, the Netherlands, Norway, Poland, Romania, Spain, Sweden, Switzerland, Turkey and the United Kingdom).

⁶² JPIAMR strategic research agenda, <http://www.jpiamr.eu/activities/strategicresearchagenda/>

⁶³ JPIAMR (2015) Funded projects, <http://www.jpiamr.eu/fundedprojects/>

Innovative Medicines Initiative (IMI)

Category: Innovation and Research | Regional - Europe

Location: n/a

Website:

<http://www.imi.europa.eu>

Focus: H

About:

The Innovative Medicines Initiative (IMI) is a public-private partnership between the European Union and the European pharmaceutical industry and aims to speed up the development of medicines, especially in areas with unmet needs. With a budget of €3.3 billion for the period from 2014-2024, IMI is currently the world's biggest public-private partnership in the life sciences.

AMR-related activities:

IMI's New Drugs for Bad Bugs (ND4BB) program specifically addresses the problem of AMR. The program currently comprises seven projects, spanning from drug discovery platforms for new antibiotics to explorations of new economic models for antibiotic development.⁶⁴ These include:

1. The ENABLE project is working to advance the development of potential antibiotics against Gram-negative bacteria. The goal is to develop viable antimicrobial candidates for testing in clinical settings.⁶⁵
2. The project DRIVE-AB aims to identify new economic models, which could incentivize the discovery and development of novel antibiotics while simultaneously ensuring equitable access and responsible use⁶⁶. DRIVE-AB is in its mid-term and is expected to publish its final recommendations in late 2017.
3. TRANSLOCATION is a project aiming to increase the overall understanding of how to promote entry to antibiotics into Gram-negative bacteria as well as how to minimize their ejection⁶⁷.
4. The COMBACTE project's focus is to develop a network of clinical investigation sites as well as improving clinical trial design. The project has also focused on capacity-building of clinical sites in south-Eastern Europe.⁶⁸
5. The COMBACTE-CARE project specifically focuses on carbapenem-resistant enterobacteriaceae (CRE). The project aims to understand how CRE infections are

⁶⁴ For an overview of the ND4BB project structure, see <http://www.imi.europa.eu/sites/default/files/uploads/documents/projects/ND4BBoverview.pdf>

⁶⁵ ENABLE (2016) <http://www.imi.europa.eu/content/enable>

⁶⁶ DRIVE-AB (2016) <http://drive-ab.eu/>

⁶⁷ ND4BB (2016) TRANSLOCATION <http://www.nd4bb.eu/index.php/myarticles/2-translocation>

⁶⁸ ND4BB (2016) COMBACTE <http://www.combacte.com>

managed, development of new diagnostic CRE tools and will conduct clinical trials with AstraZeneca's combination product, Aztreonam-Avibactam.⁶⁹

6. The COMBACTE-MAGNET project will conduct clinical trials of an antibody and a new beta-lactam.⁷⁰
7. The iABC project is advancing development of two inhalable antibiotics for patients with cystic fibrosis and bronchiectasis.⁷¹

European Academies Science Advisory Council (EASAC)

Category: Innovation and Research | Regional – Europe

Focus: H

Location: Halle, Germany

Website:

<http://www.easac.eu/home.html>

About:

EASAC is a collaboration formed by the national research councils of all EU member states. It provides independent scientific advice to European policy makers and allows national research councils to offer scientific opinions with one voice. EASAC was founded in 2001 and has since focused on providing studies on scientific issues related to EU policy, organizing workshops and issuing statements on current scientific questions.

AMR-related activities:

EASAC has repeatedly voiced concerns over the lack of innovation in the field of antibiotic research. To address this question, EASAC organized a workshop on antibiotic drug development in 2014 and subsequently released a statement, outlining the council's view of the challenges and issuing a set of policy recommendations.⁷² These recommendations include greater support for basic research, optimizing research collaborations, changed regulatory frameworks and greater public awareness.

⁶⁹ ND4BB (2016) COMBACTE-CARE <http://www.combacte.com/About-us/COMBACTE-CARE>

⁷⁰ ND4BB (2016) COMBACTE-MAGNET <http://www.combacte.com/About-us/COMBACTE-MAGNET>

⁷¹ ND4BB (2016) iABC <http://www.imi.europa.eu/content/iabc>

⁷² EASAC (2014) *Antimicrobial Drug Discovery: Greater Steps Ahead*, http://www.easac.eu/fileadmin/PDF_s/reports_statements/Easac_statement_AntimicrobialDD_webvs.pdf

BEAM Alliance - Biotechs of Europe Innovating in Antimicrobial Resistance

Category: Innovation and Research | Regional - Europe

Focus: H

Location: n/a

Website:

<http://beam-alliance.eu>

About:

The BEAM Alliance is a group of 40 small and medium-sized biopharmaceutical companies from 11 European countries and aims to be the “voice of small and medium European biopharmas involved in antimicrobial innovation.” The BEAM alliance was founded in 2015 and lobbies for three proposals⁷³:

1. Creation of a specific fund dedicated to small and medium biopharmas developing innovative antibacterial products.
2. Creation of a special status for curative and preventive antibacterial products.
3. Acceleration and simplification of regulatory pathways

InnovFin Infectious Diseases

Category: Innovation and Research | Regional - Europe

Focus: H

Location: n/a

Website:

<http://www.eib.org/products/blending/innovfin/products/infectious-diseases.htm>

About:

InnovFin Infectious Diseases was launched in 2015 as part of InnovFin Advisory, a financing initiative for research and innovation, jointly funded by the European Commission and the European Investment Bank (EIB). InnovFin Infectious Diseases enables the EIB to provide between €7.5m and €75m to innovative stakeholders active in developing vaccines, drugs, medical and diagnostic devices, and research infrastructures for combating infectious diseases⁷⁴.

⁷³ BEAM Alliance (2015) Position paper,
http://www.eib.org/attachments/documents/innovfin_infectious_diseases_flysheet_en.pdf

⁷⁴ InnovFin (2015) Fact Sheet,
http://www.eib.org/attachments/documents/innovfin_infectious_diseases_flysheet_en.pdf

Financing is aimed at projects that have passed the pre-clinical stage and for which clinical validation is needed for further development. In line with other InnovFin initiatives, the infectious disease project is initially equipped with €100 million. In the future, the tasks of InnovFin Infectious Diseases may be transferred to a new Infectious Diseases Finance Facility, which is currently under consideration for funding by EU agencies.

South-East Asian Region

Asia Pacific Foundation for Infectious Diseases (APFID)

Category: Innovation and Research | Regional – South-East Asia

Focus: H

Location: Seoul, South Korea

Website: <http://www.apfid.org>

About:

APFID was established in 1996 as a non-governmental facility for research on infectious diseases and antimicrobial agents. APFID's work is divided into four international projects:

1. The Asian Network for Surveillance of Resistant Pathogens (ANSORP, see separate entry in the surveillance section)
2. The organization of the annual International Symposium on Antimicrobials and AMR (ISAAR) with a focus on the Asia-Pacific Region
3. The management of the Asian Bacterial Bank (ABB), which collects and catalogues isolates of bacterial samples from 14 countries in the region
4. The I CARE campaign, which raises awareness for AMR in the Asia Pacific region among the public and healthcare professionals, and involves workshops and the production of information, education and communication material.⁷⁵

⁷⁵ I CARE project website available at: <http://icareproject.org/english/>

Surveillance

European Region

ECDC (European Centre for Disease Prevention and Control) Surveillance Programs: EARS-NET and ESAC-NET

Category: Surveillance | Regional – Europe

Focus: H

Location: Stockholm, Sweden

Website: http://ecdc.europa.eu/en/healthtopics/antimicrobial_resistance/pages/index.aspx

About:

The ECDC is responsible for the coordination of surveillance in the field of ABR in Europe. Its two key surveillance programs measure antibiotic consumption (ESAC-NET) and resistance (EARS-NET) in humans.

ESAC-NET collects data both at the community and hospital level to measure antibiotic consumption. The program was initially set up at the University of Antwerp / Netherlands, before it was transferred to ECDC in 2011, where it is now managed by the ARHAI (Antimicrobial Resistance and Healthcare Associated Infections) division.

ESAC-NET collects data from national focal points, which are then aggregated, summarized and reported by ECDC. Currently, 30 countries in the EU and the EEA (plus Iceland and Switzerland) report data at community level and 18 countries report hospital data.

Data reported to ESAC-NET is not yet entirely standardized, and different countries report in different metrics, such as defined daily doses or packages of antibiotics sold.

EARS-NET is a European surveillance system for antibiotic resistance. Participation in EARS-NET presupposes minimum laboratory standards and a national reference laboratory for susceptibility testing. EARS-NET collects resistance data for a number of priority pathogens, collected from either blood or cerebrospinal fluid. The system relies on standardized measuring procedures, set by EUCAST (European Commission on Antimicrobial Susceptibility Testing), which has been rolled out in most member states that report data to EARS-NET. EARS-NET data is reported to ECDC and summarized in regular reports.⁷⁶

⁷⁶ For an overview of EARS-Net reports see <http://ecdc.europa.eu/en/activities/surveillance/EARS-Net/Pages/index.aspx>

Central Asian & Eastern European Surveillance of Antimicrobial Resistance (CAESAR)

Category: Surveillance | Regional – Eastern Europe

Focus: H

Location: Administered at WHO EURO in Copenhagen, Denmark

Website: <http://www.euro.who.int/en/health-topics/disease-prevention/antimicrobial-resistance/antimicrobial-resistance/central-asian-and-eastern-european-surveillance-of-antimicrobial-resistance-caesar>

About:

CAESAR is a network of national surveillance systems for AMR in all countries of the WHO European Region that are not part of EARS-Net. It is administered by WHO EURO, and supported by the European Society of Clinical Microbiology and Infectious Diseases (ESCMID) and the National Institute for Public Health and the Environment in the Netherlands (RIVM).

CAESAR's methodology is fully compatible with EARS-NET's to allow comparison of collected data. However, data are not recorded via ECDC, which is a EU agency. It has 19 participating countries, of which five are currently reporting data (Turkey, Switzerland, Belarus, Serbia, Former Yugoslav Republic of Macedonia). The remaining countries are developing surveillance capacity and working towards joining CAESAR reporting in the future. The network therefore does not only serve as a surveillance instrument, but also as a project for capacity strengthening.

European Medicines Agency - European Surveillance of Veterinary Antibiotic Consumption (ESVAC)

Category: Surveillance | Regional - Europe

Focus: A

Location: London

Website:

http://www.ema.europa.eu/ema/index.jsp?curl=pages/regulation/document_listing/document_listing_000302.jsp&mid=WC0b01ac0580153a00

About:

Following a request from the European Commission in 2010, the European Medicines Agency (EMA) developed a standard for the harmonized reporting of veterinary antibiotic use within the EU and the EEA. The EMA has since released the ESVAC reports annually. ESVAC has expanded from initially reporting data from nine countries to currently 26 European countries. These countries account for approximately 95% of the food-producing animal population in the region. As part of the EC's Action Plan on Antibiotic Resistance, ESVAC data is now being used

for integrated reporting of antibiotic consumption and resistance in animals and humans, together with data from ECDC's EARS-NET and ESAC-NET.

Currently, ESVAC does not include species-specific antibiotic consumption data, and reports use of antibiotics in its own metric (mg per estimated biomass per year). To allow for better analysis and comparison with human use data, ESVAC aims to expand to species-specific reporting in the future.

South-East Asian Region

Asian Network for Surveillance of Resistant Pathogens (ANSORP)

Category: Surveillance | Regional - South East Asia

Focus: H

Location: Hosted by the Asia-Pacific Foundation for Infectious Diseases (APFID), Seoul, Korea

Website: http://apfid.org/06_ansorp/ansorp_01.htm

About:

ANSORP is a not-for-profit organization, which remains independent from the governments in the countries it collects data in (120 centers, 70 cities, 14 member countries). ANSORP publishes annual reports and newsletters, which highlight results of surveillance studies conducted within the network and other work on AMR in the region. The ANSORP network was set up as part of APFID.

Mohnarin - Chinese National Antimicrobial Resistance Investigation Net

Category: Surveillance | Regional - South East Asia

Focus: H

Location: Beijing, China

Website: <http://www.nhfpc.gov.cn/>

About:

Established in 2004, the Chinese National Antimicrobial Resistance Investigation Net (Mohnarin) conducts systematic susceptibility testing of clinical isolates, primarily in the secondary and tertiary health care sectors. Mohnarin is administered by the Chinese Ministry of Health.

Region of the Americas

ReLAVRA

Category: Surveillance | Regional - Americas

Focus: H

Location: International Surveillance Network - administered at the Pan American Health Organization (PAHO)

Website: <http://antimicrobianos.com.ar/category/resistencia/relavra/>

About:

The Latin America Resistance Surveillance Network (Red Latinoamericana de Vigilancia de la Resistencia a los Antimicrobianos, ReLAVRA) was set up in 1996 to strengthen laboratory capacity for antibiotic susceptibility testing across Latin America. It collects data from 20 countries for 7 nosocomial and 11 community-acquired priority pathogens.