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Antimicrobial resistance and sustainable development: A planetary threat but a financing orphan

Planet Earth faces the very real threat of having to survive and thrive in a 'post-antibiotic' era in which there are few, if any, antibiotics which effectively and affordably cure infections. A world without antibiotics would necessitate radical changes in health care and farming. Despite the severity of this threat, many low- and middle-income countries struggle to identify resources for even basic activities related to antimicrobial resistance (AMR).

In this context, the Dag Hammarskjöld Foundation and ReAct - Action on Antibiotic Resistance hosted a meeting to discuss how AMR could become more visible and how more funds to tackle AMR could be mobilised.

Introduction

In December 2018, a meeting was convened by the Dag Hammarskjöld Foundation and ReAct – Action on Antibiotic Resistance – to discuss funding for the global crisis of antimicrobial resistance (AMR). Participants came from a variety of organisations including national governments, multilateral and bilateral institutions, civil society organisations and academia. The meeting heard evidence from a number of low- and middle-income countries about the extreme difficulty in identifying funds for priority activities and finding people to act as AMR coordinators/focal points.

The meeting discussed the importance of delineating clear roles at global and country levels. In addition to global public goods functions, a role was identified for global catalytic funding to kick-start activities. AMR funding should also be integrated into existing programmes that work in relevant areas.

Six principles for AMR funding were identified – pay now or have to pay much more later; the form of funding mechanisms to follow the allocation of functions; harnessing existing funds to become more AMR-oriented; global financing channels to be visible and accessible to countries; a health systems (not single-programme) approach; and the promotion of sustainability. This meeting identified five next steps for developing concrete proposals about how to fund AMR activities:

- Explore what a global mechanism providing catalytic funding could look like.
- Develop stronger investment cases, nationally and internationally.
- Support country pilots to learn more about the practical challenges of implementing an AMR National Action Plan (NAP).
- Work with relevant international funders to explore how they can adapt their work to be more AMR-oriented.
- Make it easier for countries to access catalytic funds, particularly for developing AMR champions, strengthening narratives, collecting and using more data, and supporting countries to build their own investment cases.

Antimicrobial resistance: a planetary threat but a financing orphan

Planet Earth faces the very real threat of having to survive and thrive in a ‘post-antibiotic’ era in which there are few, if any, antibiotics which effectively and affordably cure infections. A world without antibiotics would necessitate radical changes in health care and farming. Despite the severity of this threat, many low- and middle-income countries (LMICs) struggle to identify resources for even basic activities related to antimicrobial resistance.

In this context, the Dag Hammarskjöld Foundation and ReAct – Action on Antibiotic Resistance – hosted a meeting to discuss how AMR could become more visible and how more funds to tackle AMR could be mobilised.

Antimicrobials are widely used in human and veterinary medicine and agriculture, and are then dispersed into the environment. The deliberations described in this document are the result of the interaction of a group of global health actors. This means that not all aspects of AMR are fully considered: it is also important to develop an analysis of needs and funding options for agriculture and the environment.

Neither did the meeting discuss the vital issue of research and development of new antimicrobials, diagnostics and vaccines. This is an important, but different, strand of the overall story about mobilising resources to tackle AMR.

A meeting to discuss AMR financing

A small meeting of around 20 people took place in December 2018 to discuss how AMR activities might be financed. Participants – who attended in their individual capacity – came from a variety of organisations including national governments, multilateral and bilateral institutions, civil society organisations (CSOs) and academia.

The meeting started with country presentations from Africa and Asia. A clear message emerged that there are practical difficulties finding people and money to implement AMR activities. A focal AMR-person in government can achieve a lot if they are allocated the time to devote to AMR and have sufficient authority to meet and influence key actors.

A presentation based on the report *Monitoring Global Progress on Addressing AMR*¹ reinforced the situation described by countries: there is a rapid tail-off from the number of countries that have produced an AMR National Action Plan to the number that are making significant progress with implementation.

The meeting then discussed narratives about AMR and how AMR can be presented as part of the wider movement for sustainable development, given its relevance to development concerns including poverty, equality and nutrition.

The next session explored practical examples to inform thinking about AMR financing. Relevant examples included the Green Climate Fund (which works through a number of different channels including readiness support, accreditation and funds for both project prepara-

tion and implementation), the Montreal Protocol about ozone depletion, the Global Environment Facility and the Global Financing Facility related to the health of women, children and adolescents. The meeting also discussed the relationship between AMR and existing funding streams, with a particular focus on the Global Fund for AIDS, Tuberculosis (TB) and Malaria. The meeting particularly benefited from some (as yet unpublished) academic work based on a number of key informant interviews. The preliminary results showed how people's opinions about the best way to fund AMR were greatly influenced by where they were based. Most respondents based in LMICs favoured some sort of AMR-dedicated global funding stream because it would

be a clear go-to place for financial support. Some respondents working for donors, on the other hand, were reluctant to create a new fund, partly because of the political will and work required, but also because of concerns about further fragmentation of global health funding. The meeting also highlighted that opportunities with private sector investment such as life and health insurance services and hospital investment programmes should be further explored.

Break-out groups were set the challenge of identifying tangible financing options. A clear resulting message was that it is important to think of different solutions at different levels – what needs to happen in countries and what is the role of the global level?

Frequently encountered barriers to implementing AMR activities in LMICs

- It is vital to have individuals with a designated role in moving AMR forward: AMR focal points. They cannot be effective if they are over-burdened with other non-AMR tasks or if the focal point role carries no authority.
- There is no go-to place for funds for the early stage of NAP implementation: easily accessible funds for initiating activities and for pilots would be very helpful.
- For countries, an effective AMR governance structure and a costed NAP are necessary but not sufficient: there needs to be a source of catalytic funding.

We need a convincing story to attract funds

In the context of policymaking and financing, a 'narrative' is a concise way of describing an issue and why it is important. The meeting discussed AMR narratives: how AMR can be presented as part of the wider movement for sustainable development and AMR's relevance to development concerns including ending poverty and hunger, good health, clean water, the environment and responsible production and consumption.

Developing AMR narratives is difficult but vital. AMR can be managed, but not completely solved; we must acknowledge that insufficient access to antibiotics in many countries occurs at the same time as some populations use antibiotics to excess. We need to communicate the importance of urgently tackling AMR and that if we do not do this there will be catastrophic impacts on people's health and diets, with food and medicines becoming more expensive and effective antimicrobials becoming scarcer.

Examples of AMR narratives connected to major global health issues include:

- Antibiotics have become a **substitute for good quality health care**. We must raise standards in basic infection prevention.
- **It is impossible to deliver Universal Health Coverage (UHC)** without ensuring access to affordable, quality antibiotics. AMR will make provision of basic essential health services more expensive and therefore delay UHC.
- Health insurance companies frequently fund activities related to better exercise and diet because **these investments save money over time**. The same should apply to AMR: insurance companies should demand high standards of drug stewardship and infection prevention and control.
- **The expansion of AMR is a huge risk** because it threatens recent gains in key areas of global health, including maternal and neonatal health, TB and HIV.
- **The Global Health Security Agenda** was launched in 2014 and has quickly attracted considerable attention and funding. Its aim is to create a world safe from infectious disease threats, including by elevating global health security to be a priority of national leaders. AMR is an important part of this agenda.

We need to make sure that AMR narratives are widely heard, as this will increase the prospects of mobilising funding. To do this we need to identify and educate AMR champions.

Narratives need to be backed up by credible data. There is a great deal to be done about this in the field of AMR. Existing data needs to be used to make as effective a case as possible now; the narrative can be strengthened over time as data improves. Narratives need to be based on information about:

- the prevalence and types of AMR (where is it a problem and relating to which particular drugs?),
- illness and deaths which can be attributed to AMR,
- the cost of tackling AMR and what can be achieved.

An **investment case** is a particular kind of narrative which describes alternative courses of action and their implications. Investment cases about AMR – at the hospital, national, regional and global levels – need to be developed and strengthened.

Investment cases should specify what can be done about AMR, how much that would cost and what the impact would be. This would then be compared with the negative impacts (the costs) of doing nothing about AMR. This work would build on the World Bank's 2017 simulations, which found that by 2050 annual global gross domestic product (GDP) could fall by as much as 3.8%, relative to a base-case scenario where no AMR effects were incorporated into the model. The GDP shortfall would exceed US\$ 3.4 trillion annually after 2030. Losses would disproportionately affect low-income countries. Investment in AMR was judged to have exceptionally high economic and health yields, with a potential 88% return if 75% of AMR's negative effects were avoided.²

Phases of implementation

By 2018, 112 countries had a National Action Plan for AMR, with a further 67 countries in the process of developing a NAP. However only about 12% of countries with NAPs had engaged all the relevant sectors and identified funding.³ It can be helpful to think about how countries move from developing a NAP, through early start-up activities, then scaling up implementation and moving towards sustainability.

There are four identifiable phases:

- Situation analysis and an approved NAP (Phase 1)
- Readiness to implement the NAP – ie establishing the structures and people that can mobilise resources, prioritise activities and stimulate implementation (Phase 2)
- Implementation of key priorities (Phase 3)
- Broader implementation with sustainable financing (Phase 4)

Each phase is different in every country and requires different kinds of support – technical and financial – from the global and regional levels. CSOs can play a pivotal role in many situations, including mobilising a range of stakeholders and monitoring for accountability. The nature of AMR means it is important to look at AMR governance and implementation of the NAP holistically. Tackling AMR requires change within the health system in terms of how it manages drugs and deals with infection: piecemeal funding of specific actions can help, but are not a substitute for embedded, system-wide change.

For countries without a completed NAP, the challenge is one of advocacy and practical technical support. What steps are needed to start the development of a NAP with appropriate local ownership and involvement? Countries vary in terms of how pro-active CSOs and development partners need to be.

Many countries are stuck at the first steps of implementing NAPs (Phase 2). It is challenging to develop an AMR Committee that functions effectively in relation to multiple sectors and which operates through clear action points with accountability for implementation. Full-time staff in an AMR Secretariat – or at least designated sectoral focal points – are vital at this stage.

When countries actually start implementing priority activities described in the NAP (Phase 3), much of the focus needs to be on working with existing players to make their activities more AMR-oriented. This phase may require some catalytic funding, but over time more and more funding will come from in-country sources.

The meeting did not discuss Phase 4 in any detail. At this stage, the vast majority of funding is country-based, with a relatively small role for ongoing global functions such as data analysis and information sharing.

Money for what activities, delivered and funded by whom?

Whilst exploring relevant examples and discussing during break-out sessions, meeting participants realised that it was important to be clear on what AMR activities were being talked about and the respective roles of countries and the global level. Detailed discussions resulted in the allocation of roles described in Boxes 1 and 2.

'Form follows function' is the notion that it is important to be clear about who does what. In this context, it means that the design of a funding stream depends on what activities are to be supported and who is best placed to deliver these activities.

Box 1: AMR activities - global functions

Global public good

- Data collection, analysis, interpretation and sharing. (Surveillance of resistance, the disease burden caused by AMR, antimicrobial use).
- Analysis of country progress with AMR to enable countries to compare themselves with others. Collect and share best practices and success stories.
- Guidelines and minimum standards, with accompanying technical support.
- Coordination
 - Efficient, streamlined implementation of the above functions (key roles for the World Health Organization (WHO), Food and Agriculture Organization (FAO), World Organisation for Animal Health (OIE), UN Environment Programme (UN Environment)).
 - Working with development partners which support relevant activities in countries: integration of AMR into existing funding portfolios at global level. Development partners to deliver strong, consistent messages about the importance of AMR activities and how they can be integrated into existing work.

Catalytic function

- Catalytic funding, advocacy and technical support for countries to move through the AMR Phases described above:
 - developing a NAP,
 - creating governance structures that enable NAP implementation,
 - understanding how to integrate AMR into existing programmes/initiatives and starting key workstreams within the NAP,
 - moving towards sustainability.

Some areas of work, notably collecting and using data, are both global and country functions. It is a national function to collect data according to the country's own needs and also to contribute information to meet global requirements. It is a global responsibility to collect and use this data, and to support countries which are struggling to collect it.

Different country phases require different kinds of global support

Having described **global functions** and identified **phases** of NAP development and implementation, it is

now time to bring these ideas together in the context of AMR financing.

For countries that are yet to develop a NAP or are in the early steps of implementation (Phases 1-3), the global functions related to data, coordination, guidelines and overviews of progress are all relevant. But there is also another global function: to be catalytic. 'Catalytic' in this sense means enabling a process to start and moving it towards being implemented with a country's own resources. For Phase 1 countries, much of the catalytic role is advocacy and technical support about how to



Box 2: AMR activities - country functions

The list below illustrates the range of work which needs to happen in countries. However, the list of 'AMR activities' is so long and wide-reaching that it can be more useful to think of AMR activities as a **crucial element of the health system as a whole**. From this angle, the challenge is to integrate AMR-action into the overall planning and governance of the health sector, into every health facility and programme.

- Foster political will and decisiveness, generating and using data to strengthen the case for action on AMR.
- Develop a NAP that is formally approved.
- Establish a governance structure that can enable and monitor implementation and hold actors accountable.
- Map who is already doing what and with what resources: government, technical institutions, insurers, health providers, manufacturers, development partners, CSOs.
- Work with actors in relevant areas to encourage them to work in an AMR-oriented way: this capitalises on existing in-country activities. Relevant areas include:
 - AMR specific: antimicrobial stewardship (standard treatment guidelines, use, quality, retail conditions); Infection Prevention and Control.
 - AMR sensitive: integrate AMR into existing national programmes/institutions including primary care, hospitals, laboratories, HIV, TB, malaria, maternal and child health, water and sanitation (WASH), immunisation, global health security, health worker education and essential medicines programmes.
- Allocate responsibility for AMR-specific activities which may not have an obvious 'home', such as awareness and behavioural change interventions.
- Human resources: understand the skills and numbers of people required and plan how to make these available.

address AMR. In Phase 2, a key global role is to support the development of effective AMR governance structures, as well as some financing to kick-start implementation. Phase 3 countries will also require catalytic financing to expand the proportion of activities from the NAP which are functioning well.

A country that is implementing and sustainably funding its NAP (Phase 4) has largely integrated its AMR work into national processes: the AMR response has been institutionalised and many activities will be embedded in ongoing national programmes. The global role in such

countries is mostly about data, technical standards and sharing information.



Figure 1: AMR financing functions during different phases of the National Action Plan

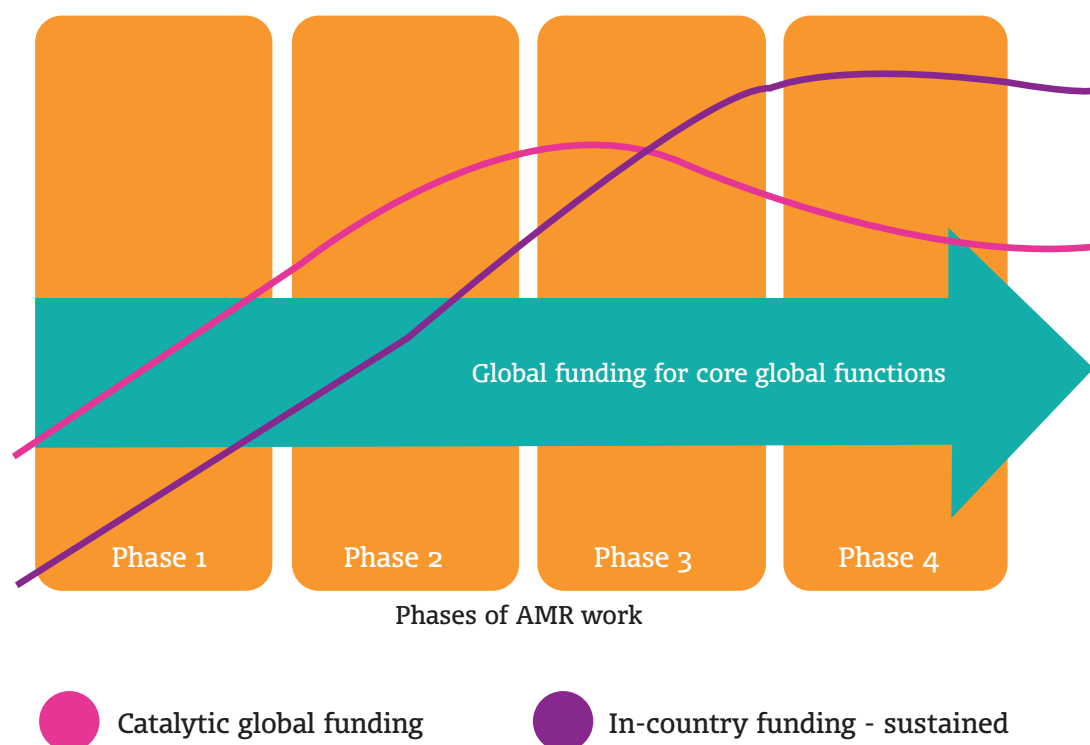


Figure 1 depicts how the composition of AMR funding is likely to change over time as a country develops its NAP and proceeds with implementation. The pink line shows the role of global catalytic funds: the amount of money required for this is likely to be highest in Phase 3 when a country moves from concerns about governance and writing the NAP towards starting to implement activities. The arrow in teal shows that there is also a fairly stable global public good element which requires ongoing financial support. The purple line shows in-country funding, mostly from government and the private sector: this funding grows over time until it can eventually plateau.

The role of regions

A focus on national and global functions does not capture the whole picture – there is also the **regional level**, involving regional bodies such as the African Union and the Association of Southeast Asian Nations (ASEAN). There is great variation amongst regions in terms of their capacity, institutional set-up and the number and sizes of constituent countries.

Nevertheless, it is possible to identify some potential functions for regions:

- **Leadership:** Be aware of when countries are stuck on Phase 1 or Phase 2. Identify areas of common concern amongst countries which would benefit from a collective solution.

- **Coordination** and information-sharing.
- **Initiate country pilots:** This could be in specific technical areas, but would ideally support the wider governance function of working with multiple actors to make sure AMR work is happening in their specific area of work. Share information about experiences.
- **Engage with regional institutions and programmes:** All levels – global, regional and national – have a role to play in ensuring that AMR activities are integrated wherever relevant and in as consistent and cohesive a way as possible.
- **Work in areas where there are economies of scale, skills shortages or other compelling technical reasons to work on behalf of a number of countries.** Examples could include specialist procurement, quality control of laboratories or analysis of drug efficacy.

‘Regions’ refers to countries grouped geographically. The same list of functions could also apply to a group of countries from different regions that are at a similar place in the journey from Phase 1 to Phase 4.

Box 3: Funding sources in addition to governments and donors

There is a risk that financing discussions focus disproportionately on funding from governments and from donors (globally, donors contribute less than 1% of total health expenditure).⁴ In many countries out-of-pocket spending and private sector investment such as insurance are also very important.

One of the country functions specified in Box 2 is to have a dialogue ‘with actors in relevant areas to encourage them to work in an AMR-oriented way’. The nature of the dialogue – and its participants – varies according to the funding source.

Out-of-pocket expenditure. Out-of-pocket expenditure on antimicrobials typically happens when there are gaps in public sector services and essential medicine supplies and when consumers buy drugs from unregulated sellers. This is an extremely difficult issue to tackle, requiring a blend of education, regulation and enforcement. Nevertheless, well-designed and widely-disseminated messages to consumers about the quality of antibiotics and appropriate usage, for example, could help to shift this existing spending away from unwittingly harmful purchases of antimicrobials. If this issue is not addressed, a significant part of overall health sector activity does not become more AMR-oriented. Universal Health Coverage is important here, as one of its elements is to reduce reliance on out-of-pocket spending.

Insurance. Spend-to-save arguments can make sense to insurers. AMR cases cost more to treat than non-resistant cases; preventing infections and resistance can make financial sense.

Principles for AMR financing

So far this document has discussed the importance of explaining why AMR is important; the shortage of money to tackle AMR; the fact that a lot of funds are already spent on AMR-sensitive activities; and the need to be clear about which AMR activities are best dealt with at the national, regional and global levels. Taking all these considerations together, it should be clear that ‘funding AMR’ must happen in a variety of ways for different activities and at different levels: the challenge is to describe a bundle of financing mechanisms that combine to address AMR. The word ‘bundle’ is used deliberately – this is not about a neat set of activities that fit together like a jigsaw. We need to think in terms of tackling AMR on multiple fronts through multiple channels.

The meeting did not go into great detail about specific funding mechanisms, but it did identify a number of principles for AMR funding (see Box 4).

Given its complexity and the multiple stakeholders involved, **coordination** of AMR funding is vital: part of efficient financing is to devise effective coordination mechanisms at various levels. The need for coordination is made all the more apparent when the reader is reminded that this paper focuses on the health sector, and that equivalent attention needs to be paid to financing for animal health and the environment. It makes sense to think in terms of starting with funding mechanisms for animal health and the environment that are separate from health funding channels because this is how governments work and because different technical skills are required.

Box 4: Principles for AMR funding

- **The choice is to pay now or to have to pay much more later:** this case needs to be made persuasively to a variety of audiences.
- The **form** of funding mechanisms should follow the allocation of **functions**. Boxes 1 and 2 described global and country roles: funding should promote this division of labour.
- Much can be done to **harness existing funds to become more AMR-oriented**. We cannot just assume that international and national players will do this: there is a need for **accountability mechanisms** for being AMR-responsible.
- Global financing channels should be clearly **visible** and **accessible** for countries.
- Mechanisms should promote a health **systems approach**, rather than fragmentation.
- The design of financing mechanisms should promote long-term **sustainability**. Some mechanisms can be explicitly short-term and catalytic.

Next steps

This meeting was an early step in developing concrete proposals about how to fund AMR activities. A lot of time was spent on thinking through the implications of the global/regional/country division of labour and mapping out how patterns of funding might change over time. There was considerable interest in mechanisms such as the Green Climate Fund and a desire to understand more about relevant examples. The discussions were inevitably inconclusive, but five clear areas for further work emerged.

1. Explore what a global mechanism providing catalytic funding could look like. Dialogues with governments, multilateral and bilateral agencies, foundations and others can build up a picture of what is desirable and realistic. There are many questions to explore, including:

- Should there be an AMR-specific, stand-alone funding channel? Or could a mechanism be housed within an existing institution? Which one? One or more UN agencies? The Global Fund? Or is there a need for a new set-up, for example a multi-partner trust fund?
- How much new global donor money is required and how much is about re-allocating existing funding?
- Is there an appetite for developing a new funding source, such as a tax or levy? A relevant example to explore is UNITAID, whose single main source of income is an airline ticket levy in approximately ten countries.⁵
- Could results-based financing be incorporated?
- Could one mechanism be designed to provide funds to a variety of types of organisations, including governments and CSOs?

- Is it possible for a large fund and its associated bureaucracy to maintain an effective focus on being catalytic?

2. Develop stronger investment cases, nationally and internationally.

- Develop tools to help countries build their own investment cases about AMR.
- Ensure that appropriate technical capacity exists and make it available to support countries with this.⁶
- Use existing data and improve data availability, develop convincing evidence-based narratives.
- Stress the implications of doing nothing or doing too little – this is impact in terms of human health, food supplies, poverty and inequality.
- Emphasise the real risk that past improvements in health, wealth and nutrition could be reversed if the world had to cope without effective antibiotics.

3. Support a small number of country pilots to learn more about the practical challenges in implementing a NAP. This is about improving our understanding of what happens during Phase 3, when activities are beginning but are not yet institutionalised and sustainable.

A crucial aspect of this is enabling one or more AMR coordinators at the country level to have time to work on the many strands of AMR work, with appropriate technical support and encouragement where necessary. What are the real-life experiences in harnessing existing activities to become more AMR-oriented? What strategies work? What conversations need to be had and what partnerships tend to be successful? What external support in terms of technical assistance and finances is required? Where do resources come from in practice?

4. Work with relevant international funders to explore how they can adapt their work to be more AMR-oriented. The Global Fund is one obvious funder, as is the Global Alliance for Vaccines and Immunization (Gavi), though this may be more in the area of product development and procurement. Key issues to explore with the Global Fund are the extent to which AMR-specific activities might successfully be included in proposals and how to encourage this, as well as ways to maximise work on infection prevention and control and antimicrobial stewardship. Would the mandate of the Global Fund need to be extended to do this in a significant way, or is the current mandate (including support for health systems strengthening) adequate?

5. Make it easier for countries to access catalytic funds in the short term and promote specific priorities for catalytic funding. Countries face a very practical challenge in knowing where to go to access funds to start the process of implementing a NAP. There are a number of things that could be done to improve this, ranging from basic steps such as compiling information about possible funding sources for AMR, to developing the global mechanism described above as quickly as possible, perhaps with an interim arrangement in place to speed up access to funds.

In terms of priorities for this funding, four areas were identified. These are all catalytic activities, in that they are about stimulating or enabling further substantive work on AMR:

- Continue to identify and work with a wide variety of **champions** to help spread understanding about AMR.
- Develop and improve **narratives** and related devices such as an ‘AMR clock’.
- Collect and use **more data, including sentinel point prevalence studies and estimates of AMR-attributable mortality**. This is to complement existing data collection funded by, amongst others, national governments and the Fleming Fund.
- Develop a tool to help **countries build their own investment cases**. Ensure that appropriate technical capacity exists and make it available to countries.

Endnotes

¹WHO/FAO/OIE, 'Monitoring Global Progress on Addressing AMR', (report, WHO/FAO/OIE, 2018). <https://www.who.int/antimicrobial-resistance/publications/Analysis-report-of-AMR-country-se/en/>

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⁶The collaborative Project on Medicine Prices and Availability by WHO and the NGO Health Action International is a potentially useful model for how this could work.

This paper was prepared by the Dag Hammarskjöld Foundation and ReAct. It was edited by Catriona Waddington, based on contributions from the meeting participants. It builds on background documents provided to the participants and processes and synthesises discussions. All contributors spoke in their personal capacities and not on behalf of the organisations or governments to which they belong. Participants were:

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