

The Road Forward for the SECURE Initiative: An ARC+ Consultation with the Global Antibiotic R&D Partnership and the World Health Organization

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Welcome and Opening Remarks

On Monday, July 18, 2022, the Secretariat for the Antibiotic Resistance Coalition, based out of the ReAct Strategic Policy Program (RSPP) and Innovation+Design Enabling Access (IDEA) Initiative at Johns Hopkins Bloomberg School of Public Health, organized a call between representatives of the Global Antibiotic R&D Partnership (GARDP) and World Health Organization (WHO) and members and other partner organizations of the Antibiotic Resistance Coalition. ARC is comprised of more than 25 civil society and intergovernmental organizations working across the human, animal, and environmental health aspects of antimicrobial resistance. Created by the WHO and Drugs for Neglected Diseases initiative (DNDi), GARDP is a not-for-profit organization established to develop new antibiotics effective against drug-resistant infections, working with partners to “ensure sustainable access to treatments, promoting responsible use and affordability to all in need.”

Serving as moderator, Dr. Reshma Ramachandran welcomed participants to the teleconsultation and offered opening remarks framing the goals for the meeting. She noted the focus of the teleconsultation in discussing two recent policy developments – 1) the draft business model released by the SECURE Initiative – a new and collaborative initiative being developed by GARDP, WHO, the Clinton Health Access Initiative, and UNICEF with the aim of improving access to essential antibiotics while also investing in stewardship and generating data on local AMR conditions and the effective use of newly approved antibiotics, and 2) the license negotiated between GARDP and CHAI with Shionogi, Inc for the novel antibiotic, cefiderocol.

Dr. Ramachandran introduced the Antibiotic Resistance Coalition and the goals of the teleconsultation including:

- that ARC members and partner organizations would learn more about these two efforts through briefings delivered by GARDP and WHO;
- that GARDP and WHO would have an opportunity to receive feedback from ARC and other partner organizations and to understand how key civil society actors and the South Centre within ARC view what conditions are critical for ensuring the success of the common aim of global equitable and sustainable access to novel and essential antimicrobials; and
- for GARDP and WHO to learn from the experiences from the diverse set of organizations assembled on how they make change, and how both the SECURE Initiative and GARDP in its licensing agreements might best support and extend such efforts.

Antibiotic Resistance Coalition Newsletter

The Antibiotic Resistance Coalition (ARC) publishes a monthly newsletter covering ARC Activities, key policy updates, and research updates in the space of antimicrobial resistance. Past issues of this newsletter can be found [here](#) and interested individuals can sign up using the link [here](#).

Meeting Participants

- Mirza Alas – South Centre
- Rosa Castro – European Public Health Agency
- Michelle Childs – Global Antibiotic R&D Partnership
- Jennifer Cohn – Global Antibiotic R&D Partnership
- CJ Cole – ReAct Strategic Policy Program
- Nafis Faizi – People’s Health Movement
- Matheus Falcao - Instituto Brasileiro de Defesa do Consumidor
- Anmol Gupta – Universities Allied for Essential Medicines
- Tine Rikke Jorgensen – World Health Organization
- Veena Karir - Médecins Sans Frontières Access Campaign
- Tapiwanashe Kujinga – PATAM Zimbabwe
- Tanisha Luthria – ReAct Strategic Policy Program
- Rohit Malpani – Global Antibiotic R&D Partnership
- Manuel Martin - Médecins Sans Frontières Access Campaign
- Phillip Matthew – ReAct Asia Pacific
- Viviana Munoz – South Centre
- Cristina Praz – Global Antibiotic R&D Partnership
- Suba Srinivasan – Global Antibiotic R&D Partnership
- Reshma Ramachandran – ReAct Strategic Policy Program, Universities Allied for Essential Medicines, Yale School of Medicine
- Anthony D. So – ReAct Strategic Policy Program, Johns Hopkins Bloomberg School of Public Health
- Maarten van der Heijden – World Health Organization
- Joshua Woo – ReAct Strategic Policy Program, Johns Hopkins Bloomberg School of Public Health

Briefing from GARDP and WHO on the SECURE Initiative draft business model

Maarten van der Heijden, Technical Officer, Department of Global Coordination and Partnership, Antimicrobial Resistance Division, World Health Organization



In his briefing, Mr. van der Heijden acknowledged the opportunity to discuss SECURE – The Antibiotic Facility with ARC members and other civil society organizations as it has now moved from an idea to a reality. He noted the ongoing work to establish the SECURE Initiative over the past two years with close collaboration between WHO and GARDP, with technical input from CHAI and UNICEF. He emphasized that the primary focus of SECURE was around access as newly registered antibiotics are not reaching low- and middle-income countries (LMICs). Moreover, major global supply disruptions and shortages are also impacting access to generic

antibiotics. SECURE intends to impact the availability and affordability of these medicines in collaboration with originator and generic companies.

Mr. van der Heijden also relayed that SECURE is currently in Phase 1 of their roadmap in setting up the initiative and moving it from a concept to a project. Currently, the plan is to be in Phase 2 by mid-2023, during which implementation would begin initially in five countries as a pilot program. This would continue until 2026 before the launch of Phase 3 when there would be efforts to ensure long-term maintenance and establishment of a full-scale program with the goal of expansion across all countries. The pilot program has been limited to five countries due to funding and logistical reasons. So far, SECURE has acquired \$2 million USD in seed funding.

He next outlined the SECURE Impact Chain with the intended benefits of creating impact around access as well as stewardship in as many countries as possible focusing on LMICs. Towards achieving these goals, SECURE would collaborate with manufacturers to bring antibiotics to different markets and would also look at different modalities for companies to work with SECURE. The four CORE activities SECURE will pursue as part of the Impact Chain include:

1. **Assessing the local AMR situation** (Currently, SECURE has focused on five countries to assess the local antibiotic access and use situation. Although the sample size is limited due to constraints in funding, this will still provide data on antibiotic use, resistance, and access in these areas. SECURE will also be engaging with local partners to further assess the AMR situation.)
2. **Provide access to the SECURE portfolio** (The initial focus will be within LMICs where SECURE will develop product commercialization plans for each product within the profile and the specific country. This would also entail facilitating regulatory approval and ensuring that tailor-made antibiotic stewardship plans are also developed.)
3. **Procurement, forecasting and market shaping** (SECURE will ensure the procurement of antibiotics within SECURE's portfolio while also providing demand forecasting to suppliers to allow for a more stable antibiotic market.)
4. **Support evidence generation, optimal use and stewardship of antibiotics, and contribute to local capacity strengthening** (Entities part of SECURE will be involved in much as the work as SECURE around stewardship. This would also include collecting insights and performing check-ins when countries go above the demand forecasted for antibiotics within the SECURE portfolio. Additionally, SECURE would also work with countries to establish and strengthen local capacity for conducting clinical studies that would inform national guidelines.)

While the geographic scope of the SECURE Initiative during the pilot phase would be limited to five countries, the goal is to expand the geographic scope as soon as possible. For newly registered antibiotics, SECURE is advocating an expansion across all LMICs, depending on licensing. For generic antibiotics, the geographic scope would ultimately be across all countries, but with SECURE aiming to supply countries only for the short term as long as needed to mitigate shortages/stockouts. This has been discussed with the G7 countries and there has been ongoing engagement with G20, which will continue into the next year to allow for expansion of SECURE beyond the initial five pilot countries.

In developing SECURE's business model, the ambition is that following the initial public and philanthropic funding raised for the pilot phase that SECURE would be funded through self-sustaining sources for its programmatic activities. SECURE is currently exploring options for the financial model of

SECURE, for instance the feasibility of using a subscription model such that countries would pay a fixed amount or minimum revenues over a set period of time in return for a guaranteed supply of antibiotics. SECURE has also been examining other proposed business models including those within the [Boston Consulting Group report](#) released earlier this year. While there is recognition that there have been some issues with the implementation of the subscription model as adopted by the United Kingdom, it is unclear whether such a model would be appropriate for LMICs.

Recognizing that SECURE has limited capital power and complex marketing objectives around access and stewardship, the project will also need sophisticated market shaping strategies. The core objectives would be market stabilization and expansion. Such a strategy would minimize risk, while also not disturbing competition. Approaches such as pooled procurement would be utilized primarily for securing sufficient volumes of generic antibiotics, but also for affordable purchasing of newly registered antibiotics. Additionally, SECURE has already done a study on financing solutions including looking at the possibility of social impact bonds, but the application to the procurement of antibiotics to address AMR may not be suitable. SECURE is exploring financing options for stewardship. SECURE is also looking further into stockpiling strategies to rapidly scale-up supply when there are disruptions.

As part of the next steps for SECURE, there will be a global consultation during the third quarter of 2022 hosted on the WHO webpage and a SECURE website. This will be a written consultation that will be open for at least two months, which will be open to all. SECURE will continue to fundraise, finalize its operational model, and further develop the economic model. SECURE will also begin country consultations, but cognizant that there must be a package to offer beforehand. Finally, SECURE will be exploring options for ensuring stewardship including support from national governments, considerations around the pricing of antibiotics, and what other strategies must be employed by countries at the hospital level towards this goal.

Q&A Session

Civil society participants in the teleconsultation thereafter had an opportunity to ask clarifying questions to the presenters from WHO as well as GARDP.

First, a question was posed regarding whether the countries for the pilot phase had been identified given that SECURE had been in discussions with country governments for Activity 1 of “assessing the local AMR situation.” An additional follow-up question was posed querying whether both LMICs as well as HICs would be included in the pilot phase.

Mr. van der Heijden clarified that SECURE has not yet identified the countries for the pilot phase as this is also more of a political process wherein countries can become partners to SECURE. However, there is a list of countries they are considering for the pilot phase based on which countries already have dedicated national action plans for AMR and have the capacity to collaborate with SECURE. This includes having the political will, domestic funding, mobilization capacity, and a sound healthcare infrastructure within which SECURE would operate. GARDP has also been conducting a landscaping exercise of countries for their recently negotiated license for the novel antibiotic, cefiderocol, which will be part of the initial SECURE portfolio; this also may be of assistance to SECURE in determining which countries to be part of the pilot phase. He also clarified that the pilot phase would only include LMICs as the goal is

to demonstrate proof-of-concept within those settings and ensuring that countries are dedicated to being part of the SECURE Initiative.

Next, a question was posed regarding the GARDP pipeline and whether besides the range of novel and generic antibiotics noted to be within the initial portfolio if other novel compounds would be included. Dr. Jennifer Cohn of GARDP clarified that SECURE is not the same as GARDP, so it would not necessarily include the full range of products within GARDP's portfolio and would be based on objective assessments of resistance patterns within local hospitals across countries part of the Initiative. However, GARDP is developing access plans for other antibiotics within its portfolio.

Mr. van der Heijden also noted that for selection of other newly registered antibiotics as part of the SECURE Initiative, they would have to go through a proper process with a WHO expert group. From a practical perspective, all countries should have access to antibiotics from WHO's essential medicines list. SECURE aims to initially explore such practical options, but may expand in the future. Funding continues to be challenge as the Initiative needs \$50 million USD to start and they have only obtained \$2 million USD to date.

Supporting evidence generation and stewardship of novel antibiotics

**Philip Mathew, ReAct Asia-Pacific;
Advisor, International Centre for AMR
Solutions; Doctoral Student, Global Public
Health, Karolinska Institutet**



Dr. Mathew opened his remarks noting his happiness in seeing the licensing plan for cefiderocol recently negotiated by GARDP and inclusion of this drug within the SECURE Initiative portfolio. He raised five considerations regarding this and the selection of other products within the portfolio:

Need for standardized criteria for evidence in selection of novel antibiotics for SECURE portfolio

Almost all clinical trials examining efficacy for cefiderocol were non-inferiority trials and there does not exist large-scale data of efficacy in the real-world setting. Moreover, the recommendations for use for cefiderocol are based on consensus and expert opinion rather than clinical trial data. Thus, this raises the question for SECURE of whether there should be a basic standard or set of criteria for robustness of evidence in selecting novel antibiotics for the portfolio.

Prioritizing allocation of novel antibiotics in areas of high AMR burden

As cefiderocol has demonstrated efficacy against carbapenem-resistant gram-negative organisms, access should be prioritized in areas where there is the highest burden of gram-negative sepsis. He

noted that the load of gram-negative sepsis is higher in lower resource contexts where the case fatality rates are also much higher. However, there also must be investigation into the molecular mechanisms of resistance to ensure appropriate use of cefiderocol in such settings as well.

Need for complementary diagnostic testing to ensure stewardship of novel antibiotics

There may also be a concern regarding the lack of diagnostic facilities in areas that will use cefiderocol in the future. While unlike other newer antibiotic combinations such as ceftazidime-avibactam and meropenem-vaborbactam (which are the two other novel antibiotics included within the SECURE portfolio) cefiderocol has in vitro activity against carbapenem-resistant infections, cefiderocol should not be used in all cases of carbapenem resistance. Centers using cefiderocol should have access to diagnostic testing given its suggested broad-spectrum activity against carbapenem-resistant infections and the availability of alternatives with a narrower mechanism of action against carbapenem-resistant organisms.

Consideration of pricing and stewardship of novel antibiotics for enabling access

All three novel antibiotics included within the SECURE portfolio have limited availability, including through imports in countries such as India. Therefore, the selection of drugs by SECURE is appropriate and timely. Specifically in India, studies have indicated that 30% of isolates are carbapenem-resistant Enterobacteria, thus highlighting the need for alternatives to colistin. However, the pricing of these drugs is critical to ensuring access. Both pricing as well as stewardship efforts should be based on wide consultation with local experts.

Expansion of SECURE's scope beyond drugs to other complementary health technologies

The current SECURE platform should also aim to adopt the approach of the Global Drug Facility for tuberculosis. Rather than focusing solely on antibiotics, the mandate should be expanded to include other critical components such as antibiotic sensitivity testing systems, lateral flow assays for looking at beta-lactamases and carbapenemases, and molecular diagnostic testing platforms. While this may not be possible in the short-term, it should be advocated for as part of the medium- to long-term strategy.

Reshma Ramachandran, Board President of Universities Allied for Essential Medicines North America; Assistant Professor at Yale School of Medicine; Co-Director of the Yale Collaboration for Research Integrity and Transparency (CRIT)



Building off the previous presentation from Dr. Mathew, Dr. Ramachandran continued the discussion regarding the selection of novel antibiotics proposed as part of the SECURE Initiative and considerations for further evidence generation of these specific products. She noted that in the case of antibiotics, regulatory agencies have been successfully lobbied to pilot approaches that further lower approval

standards including the use of non-inferiority trials where antibiotic drugs are tested against a comparator or placebo and a primary endpoint is considered to be met if the candidate antibiotic is within a margin of efficacy of the comparator.

Her research has also shown that for novel antimicrobials awarded the special designation of being a qualified infectious disease product by the FDA, that over 20% were approved based on *in vitro* studies and a majority were tested in non-inferiority trials. Nearly half of the pivotal trials supporting FDA approval of these drugs also failed to enroll patients with potential or confirmed resistance. For less than a third of these indications did FDA confirm any efficacy against resistant pathogens. For clinicians prescribing and patients being administered these treatments, this means there is limited evidence available of the drug's effectiveness against resistant pathogens.

Among these qualified infectious disease products drugs are the three antibiotics proposed to be part of the SECURE Initiative's initial portfolio – ceftiderocol, ceftazidime-avibactam, and meropenem-vaborbactam. Examining their pivotal clinical trials and other supporting studies also indicate that from a clinical perspective, there remains continued uncertainty of their efficacy against resistant pathogens. Within their pivotal clinical trials, other carbapenem drugs served as the active comparator within non-inferiority studies, thus making it unclear whether the novel antibiotics were clinically effective against carbapenem-resistant pathogens. Moreover, as noted within the SECURE Initiative draft business model, both ceftazidime-avibactam and meropenem-vaborbactam are ineffective against New Delhi metallo-beta-lactamase (NDM-1) producing Enterobacteriaceae, thus excluding a significant proportion of patients with drug-resistant infections in South Asia.

She also noted that access to ceftazidime-avibactam and meropenem-vaborbactam were also considered as part of the AMR Preparedness Index, prepared by the Global Coalition on Aging and the Infectious Diseases Society of America and funded by the International Federation of Pharmaceutical Manufacturers Associations. The index assessed 11 countries' performance across seven categories thought to contribute to antimicrobial resistance. Included within this group of countries was several high-income countries as well as middle-income countries including China, India, and Brazil. Despite limited demonstrated efficacy of these two drugs against carbapenem-resistant pathogens including NDM-1, as all three middle-income countries had not approved or reimbursed this drug, their scores for the access category were lowered.

The limited evidence of these drugs' demonstrated efficacy against resistant pathogens including those that are considered to be critical on the WHO Priority Pathogens List thus heightens the need for continued, robust evidence generation to not only accurately inform clinical practice, but also key aspects of the SECURE Initiative business model including the geographic scope of where these drugs should be targeted for access and the continued evolution of SECURE's portfolio as further novel antimicrobials are developed. Within the draft business model, there is mention of the collection of real-world evidence in developing an evidence-based portfolio of essential antibiotics and informing treatment guidelines. However, in proceeding forward with utilizing real-world data to make such decisions, Dr. Ramachandran noted there must be further consideration of the promises as well as the perils in using such evidence sources. Prior research has shown that real-world data sources such as medical claims and electronic health records are rarely adequate for emulating clinical trials and not at all for confirming clinical benefit drugs approved through the FDA accelerated approval process. Thus,

the SECURE Initiative must proceed with caution in utilizing real-world evidence for the stated goal of “enhancing the public health value of these new agents” and informing treatment guidelines.

She concluded by stating that the SECURE Initiative must make clear the rationale for the selection of novel antimicrobials within their portfolio and the geographic impact of such a selection. With its unique role in providing access to novel drugs to address areas of the world where the burden of antimicrobial resistance is felt the most, SECURE could play a role both downstream in designing robust studies to confirm clinical benefit of selected drugs, especially against resistant infections, but also upstream, in urging regulatory agencies to set higher standards for regulatory approval.

Reactions from WHO and GARDP and Q&A

Mr. van der Heijden (WHO) responded regarding the scope of the SECURE portfolio that it is now only focused on antibiotics and does not include diagnostics. However, there is an interest of expanding the portfolio to include diagnostics in the future and there have been ongoing discussions with Foundation for Innovative New Diagnostics (FIND). Primarily, the use of real-world evidence will be for collection of data within vulnerable populations and not with the intent to replace clinical trials. However, the hope is that such data collected within LMICs can be used to inform future marketing authorization and local clinical guidelines.

Dr. Jennifer Cohn also noted that the concerns regarding the selection of antibiotics and the evidence generation to date pertains to regulatory and economic policy of critical nations with stringent regulatory agencies (SRAs) that pharmaceutical companies are targeting. However, there is a need for antibiotics with some evidence of efficacy against carbapenem-resistant organisms, which are now part of the WHO Priority Pathogen List. She noted that there may be value in using non-clinical data as well as safety signals for these antibiotics, but currently, this cannot be relied upon over real-world evidence. At the very least, such real-world evidence would be used to determine optimum use of the drugs. SECURE could assist downstream by helping facilitate quality studies on these antibiotics as well as upstream to improve regulatory standards for approval. However, regarding what antibiotic candidates go through the pipeline, SECURE is not able to re-evaluate every product coming to fruition and does not want to replace existing pivotal clinical trials that leads to regulatory approval. While there may be issues with non-inferiority studies as the basis for regulatory approval for most antibiotics, addressing this may not be within SECURE’s scope.

Dr. Cohn also emphasized that SECURE is interested in diagnostics, but it is unclear if this can be included into the portfolio in the near future. Moreover, whole genome sequencing is not widely available, so need to balance access to existing diagnostic tools. There might be a possibility of being able to triage testing to identify carbapenem-resistant organisms, but it is unclear how much this is needed in real clinical scenarios. Finally, regarding stewardship, SECURE views pricing as a rather blunt instrument to enact stewardship and should not be used as the main lever for stewardship. SECURE would want to work closely with local and regional partners to determine what stewardship measures and diagnostic tools are being utilized and how these could be further strengthened. Again, this is where real-world evidence could play a significant role.

One civil society participant queried further about the geographic scope in the selection of antibiotics, particularly that of India given the lack of efficacy for the predominant resistant strain of NDM-1. Mr.

van der Heijden responded that he could not speak for the drugs selected as they were determined by a consortium of partners and noted that the list is only for right now, which may evolve in the future. Dr. Cohn noted that for cefiderocol, although there are some potential concerns based on in vitro data in the development of resistance, its use should still not be discounted. A potential interesting case study may emerge with zoliflodacin for drug-resistant gonorrhea, which will likely be approved.

Ensuring sustainable supply and access to novel and generic antibiotics

Viviana Muñoz, Coordinator of the Health, Intellectual Property, and Biodiversity Program at South Centre



Dr. Muñoz introduced South Centre as an intergovernmental organization that works closely with developing countries, comprised of 54 Member States. As a think-tank for the south, South Centre aims to leverage south-south cooperation to support development efforts. South Centre has worked in collaboration with several civil society organizations in the realm of AMR prevention and control. She stressed the importance of linking the local to the global, supporting civil society groups, and building local expertise to support action on AMR.

Dr. Muñoz highlighted the process described by SECURE of engaging and choosing countries, stressing the importance of needing to make clear to countries what the value-add would be of those services offered by SECURE to address shortages and stockouts of antibiotics. She also noted the importance of helping countries identify the right suppliers, going beyond their current procurement process. She pointed out that within the current draft business model there is not clear guidance around global level procurement. Transparency around the choice of suppliers for the SECURE Initiative would be essential to ensure long-term impact. Moreover, SECURE should consider support mechanisms for local generic producers at the country-level as one of the entry points that would create more interest from certain countries to be part of the SECURE Initiative. Currently, there is a lot of skepticism with the scale of global supply chains, so there is more demand for local supply. It would be good for SECURE to see how they could address shortages by linking with local production.

Additionally, regarding the financing models being developed by WHO in collaboration with universities in the Global North, Dr. Muñoz stated that it would be helpful to have this information be made publicly available. The model should also be developed beyond these universities, inclusive of others within the Global South. SECURE could at least open a consultation on adapting this model for the LMIC context. Finally, she also emphasized the curiosity voiced by many as to the selection of countries that will piloting SECURE.

Matheus Falcao, Health Analyst at Instituto Brasileiro de Defesa do Consumidor (IDEC)



Mr. Falcao introduced IDEC as a nationwide organization working to represent healthcare users in economic forums. In Brazil, there have been some challenges to access to existing antibiotics, primarily with shortages of both essential and novel antibiotics. Initially, it was hypothesized that this shortage of antibiotics was related to drug pricing regulations within the country, but that was proven to be wrong. It became clear that this was due to a lack of local capacity. Instead, Brazil and LMICs have been largely dependent on the importation of antibiotics from global supply chains where there are disruptions contributing to shortages of these drugs.

Thus, SECURE must consider alternatives for addressing the lack of economic interest in manufacturing or innovation of antibiotics that has led to shortages and limited access in countries. This might be done through a combination of public laboratories with centralized procurement as occurred in Brazil with vaccines. Mr. Falcao posited that this might create a virtuous cycle, thus ensuring supply of key health technologies to health systems. As the shortage of antibiotics and lack of innovation in developing novel antibiotics is related to the lack of interest and thus investment from the private sector due to relatively small revenue compared to other more profit drugs, instead of the typical practice of public funding flowing to the private sector to incentivize their participation, public manufacturers could instead play a role.

He noted that few other countries have public laboratories (e.g. China, Indonesia, Brazil, Argentina, and Cuba) and that Canada had had their own state-owned facilities. Public laboratories could provide a more transparent and stable supply to meet the needs of health systems compared to transnational markets. This could also help generate income and technological development at the national level. This could also be accomplished through a not-for-profit entity that is integrated into the health system. For public laboratories to be successful and to meet the same regulatory and manufacturing quality obligations as the private sector, a sustainable source of designated funds will be needed.

Moreover, centralized procurement by which a state body or international organization purchases a large amount of a health technology can ensure that there are adequate funds for the public laboratory to develop and maintain itself. In the long-term, the combination of centralized procurement and public manufacturing can create a virtuous cycle such that laboratories provide the health system with a transparent, adjustable, and stable source of antibiotics and the procurer strengthens the laboratory with a source of continuous funds. Further positive economic externalities can be realized in the form of income generation and technology development for that country as well.

Brazil has struggled with antibiotic shortages including of amoxicillin and penicillin benzathine. While Brazil did have local production capacity for antibiotics until the 1990s, the combination of the entrance of multinational manufacturers, improvement in regulatory standards, intellectual property laws, and

limited industrial policies eroded this national industry. However, Brazil has successfully been able to demonstrate the feasibility of a combination approach of public laboratories and centralized procurement with vaccines through the Immunization National Program. This has allowed Brazil to have sufficient vaccine supply and coverage, leading it to be the first country in the Americas to eradicate poliomyelitis. Two state-owned manufacturers serve this national program – the Butantan Institute and Fiocruz’s Bio-manguinhos. Not only do they supply vaccines to Brazil, but also have sold vaccines to international programs coordinated by WHO and UNICEF for use in countries in Africa.

Developing payment models for sustainable access to novel antibiotics

Rosa Castro, Senior Policy Manager for Healthcare Delivery & Networks Coordinator for the European Public Health Alliance (EPHA)



Dr. Castro began introduced EPHA as a coalition of more than 80 organizations including health professionals, patients and others NGOs representing vulnerable population groups (e.g. children, older, homeless, drug users, AIDS, Roma communities, gender focused organizations) that specifically work together around AMR to ensure it remains high on the political agenda, under a One Health approach. EPHA has emphasized the need for better education and information to be targeted to health professionals and patients to reduce misuse and overconsumption of antibiotics. EPHA’s main advocacy activities are directed to European authorities, including Member States in supporting the development and implementation of National Action Plans with a One Health approach. Working closely with its members and partners of the European Alliance for Responsible R&D and Affordable Medicines, EPHA has also advocated for access to effective antibiotics through a variety of mechanisms including:

- an end-to-end approach to de-risk the development of novel antibiotics through adequate public funding;
- conditions around affordability, availability, and accessibility tied to any public R&D funding for AMR technologies that would ensure accountability by the developer;
- delinkage of the costs of R&D investment from the price and volume of sales;
- coordination between national authorities and EU institutions to develop new antibiotics and address global unmet health needs;
- support for research around interventions to prevent the development and spread of AMR including vaccines and diagnostics with delinkage principles;
- encouragement of incentive models such as milestone prizes, public buyouts of compounds, or product development partnerships; and
- avoidance of pharmaceutical monopoly extensions and increasing prices.

Dr. Castro relayed that recently there has been a lot of work in the EU focused on developing a pharmaceutical strategy for Europe, which was developed after the emergence of the COVID-10 pandemic. This intends to address pharmaceutical policy issues including shortages of medicines such as antibiotics. This strategy has also informed the revision of the EU general pharmaceutical legislation, where the EU Commission is creating a proposal for the revision, which is likely to include new pull incentives for the development of antibiotics used in human health. The Commission is closely watching what is currently being implemented and piloted in different European countries.

In December 2021, the European Alliance for Responsible R&D and Affordable Medicines developed a series of recommendations around incentives within the new EU pharmaceutical strategy. Specifically for AMR, they examined two proposals the EU Commission is currently considering and were discussed in consultation with other stakeholders in April 22:

- 1) transferrable exclusivity voucher that could be transferred or sold for use to extend the protection time period of any other patented medical product in exchange for the regulatory approval of an antibiotic for an unmet medical need, and
- 2) the “Pay or Play” model where either a manufacturer includes an antimicrobial within its portfolio or pays into a fund that would finance the development of novel antimicrobials.

In response, EPHA partnered with ReAct Europe to develop a joint position paper noting that market incentives may not be the most efficient and will instead be socially costly. Specifically, in relation to the Transferrable Exclusivity Extension, they enumerated the following 10 reasons why such an incentive would be inefficient and socially costly:

- 1) *It will create additional excessive social costs, which will directly affect European patients and national payers.*
- 2) *It is ethically questionable as one therapeutic area will be subsidized at the expense of another.*
- 3) *It presents significant risks of overcompensation and disproportional reward for drug developers.*
- 4) *It will cause additional problems of predictability of financing for EU healthcare systems.*
- 5) *It would primarily favour large companies and only secondarily small and medium enterprises (SMEs).*
- 6) *It risks allowing a weak link between the value of innovation and its rewards.*
- 7) *It does not ensure patients’ access to the new antibiotic brought to market.*
- 8) *It does not consider the availability of viable compounds in the pipeline in early discovery and development to actually “pull” from.*
- 9) *It does not inherently ensure obligations of stewardship and appropriate use and would require that conditions and compliance stipulations be attached to the voucher to ensure appropriate use.*
- 10) *It will set a bad precedent and can lead to huge social costs outside of the EU.*

Creating market-shaping interventions to enable access to novel and generic antibiotics

Anthony So, Director of the ReAct Strategic Policy Program and Professor of the Practice at Johns Hopkins Bloomberg School of Public Health

Overcoming Path Dependency: Regional Alliances

Coalition of the Willing

- C. Other countries with significant domestic manufacturing capacity
- B. Country with significant domestic manufacturing capacity
- A. Countries at greatest risk of limited access

Efficiency

Equitable Allocation

Effectiveness

Procurement

Development and Production

Healthcare Delivery

So AD, Woo J. Achieving path-dependent equity for global COVID-19 vaccine allocation. Cell Mol 2021; 218: P573-577.

Source: So AD, Woo J. Towards a Regional Approach to Ensuring Vaccine Access as part of Pandemic Preparedness and Response, 2022 (in review)

Dr. So noted the remarkable opportunity to re-engineer the pharmaceutical value chain in tackling AMR, but the need for putting innovation and access into context. He then pointed out that the traditional business model for drug development has not been up to the task of delivering a robust pipeline of novel classes of antibiotics. Just a half billion has been spent so far in push financing including through CARB-X and GARDP. Even with an additional billion in financing from the AMR Action Fund, this barely reaches the \$1-4 billion target that the International Federation of Pharmaceutical Manufacturers' Associations has claimed that would be needed to bring just one new antibiotic successfully to market under the traditional business model. Thus, the need for an alternative business model is clear, without a huge infusion of financing.

Dr. So noted that two conditions would be necessary for such a model including 1) antibiotics have to be cost-effective against the development of alternative, complementary technologies, such as vaccines and diagnostics; and 2) even more significantly, these technologies to tackle AMR need to save more lives than cost-effective, non-pharmacologic interventions to tackle AMR. World Bank projections and a proposed Organisation for Economic Co-operation and Development AMR service package costing \$2 USD per capita demonstrate that other interventions are cost-effective, even paying for themselves in cost savings, thus also highlighting the need for an alternative business model. For this, the public sector's role in manufacturing will be key.

He then highlighted a simple model developed by the ReAct Strategic Policy Program estimating antibiotic drug regimen costs with expected annual sales of \$200 million, \$400 million, or \$800 million under three different scenarios in terms of three different U.S. patient incidence scenarios (common vs orphan vs very rare). The model shows that for the U.S. market that many of the urgent or serious drug-resistant pathogens are very rare and if the traditional model for pharmaceutical R&D was used, drug regimen costs would exceed \$10,000, even for modest annual sales of \$200 million. Additionally, even if the number of the patients globally could become part of the shared, effective market, ensuring access at such prices especially in resource-limited settings would be challenging. He further noted that the market sizes would make differential pricing schemes difficult to develop if expectations for return on investment were unchanged. Thus, SECURE faces the challenge of "price x quantity" – namely, whether target product profiles for novel antibiotics would include a price point and how quantity would be controlled globally, and not just in LMICs? He also pointed out the importance of understanding the tiering strategy given its effect on who is in and who is out of the pooled procurement agreement.

The presentation covered several different approaches for ensuring more effective, affordable, and sustainable supply of antibiotics through greater public or non-profit engagement in manufacturing these treatments:

- 1) Engaging the public sector in playing a role in supplying drugs or vaccines as has been done in Brazil and China, thus bridging the gulf between what innovation is incentivized by a paying market and what innovation serves a public health priority.
- 2) Disbursing push or pull financing to the public sector to build capacity or speed scale-up of manufacturing as offered with COVID-19 vaccines.
- 3) Allowing the healthcare delivery system to play a role in producing pharmaceuticals as has been demonstrated with CivicaRx, aligning interests of providers and patients with the interests of the drug manufacturer by vertically integrating both under the same non-profit.

Dr. So then asked whether the SECURE Initiative agreed that the public sector will need to have a greater role in manufacturing antibiotics and other technologies needed to tackle AMR, if it has yet identified a coalition of target countries for its initial efforts and if these have local production capacity, and how it intends to achieve effective delinkage, both in LMICs as well as in HICs.

He also discussed pooled procurement as another leverage point and what can be learned from the Global Drug Facility that has become the one-stop shop for TB medicines, diagnostics, and supplies. Through pooled procurement of these goods, the Global Drug Facility has helped ensure stable, forecasted demand for suppliers and negotiated concessionary prices from those manufacturers. Additionally, it has also created a strategic rotating stockpile allowing it to overcome disruptions of spot shortages of TB products and ensuring those who need the treatments now receive it first. Dr. So also suggested that pooled procurement facilities could provide technical assistance to country programs to help scale up the use of antimicrobials in resource-limited settings, as the Global Drug Facility does for TB drugs. He also asked whether UNICEF has had similar experiences to that of the Global Drug Facility in ensuring low-volume markets or a strategic rotating stockpile to mitigate shortages as well as transparency in the tender process and pricing. He noted the recent example of UNICEF being under pressure to sign a non-disclosure agreement over price transparency for Paxlovid.

Finally, he also posed a question regarding what sorts of “carrots and sticks” the SECURE Initiative would plan to bring to encourage manufacturers to go along. At the country level, he also asked what the coalition of the willing would look like – whether it would be of willing countries with greatest risk of limited access or those with significant domestic manufacturing capacity.

Reactions from WHO and GARDP and Q&A

Mr. van der Heijden responded to Dr. Munoz’s remarks stating that they currently do not have a clear picture around the supply chains and cannot overpromise. SECURE can facilitate procurement of antibiotics in the short-term, but if countries want long-term support, country leadership is key to create more transparency in the market. He also stated that he does not think that SECURE can help countries identify the right supplier and perhaps this is something they could pursue in the long-term. However, for the short-term, SECURE could provide a backup for generics. He also clarified that while their academic partners may be leading development of economic model, they are not facilitating the process. In co-developing this economic model, SECURE also sees the importance of LMIC representation and so, has also involved an economist from the Africa Centres for Disease Control and Prevention. SECURE is working to set up an expert group and is planning to reach out to South Centre to be part of this process as well.

In regard to local manufacturing, Mr. van der Heijden notes that this is a complex issue with some potential downsides, but that SECURE is currently exploring options for local manufacturing. He noted that there is a true lack of capacity for producing active pharmaceutical ingredients. Moreover, there are several considerations that SECURE is not able to address including politics, environmental considerations around production, and more. SECURE has engaged manufacturers on this issue, but also found that many manufacturers do not have the capacity to go through the WHO Prequalification process as it is costly. Additionally, they've also found that for many manufacturing facilities, there is difficulty being up to date with international manufacturing standards. SECURE could play a role in providing funding for the WHO Prequalification process, but not necessarily local regulatory and manufacturing standards.

Mr. van der Heijden also relayed that they are not content with the proposed EU Commission incentives for R&D such as vouchers. He also noted that during the initial phase of the SECURE Initiative, they will not be able to influence the way R&D is financed. However, it would be good to have continued discussions about the CivicaRx model as it seems promising. There are also several European stakeholders interested in emulating such a model.

Dr. Cohn also noted that the idea of pre-vetting suppliers could be possible with consideration of whether these suppliers strengthen local capacity and reduce bottlenecks in the manufacturing process. In thinking through the economic model, she outlined a possible three-dimensional matrix of indicators included, country context, and type of economic model. Such a matrix should be applied so local manufacturers might be involved though cannot be relied upon. Other considerations would also be how the economic model affects affordability, willingness to pay, and cost-effectiveness. It will also be important to see whether such vetting of suppliers can allow for diversification of products, and if stewardship can be incentivized such that diagnostic use can be improved. She also queried whether suppliers who meet certain criteria such as having a waste management plan or not being incentivized by volumed-based sales should be considered or whether they should be willing to do these things where SECURE plays a role to build this further.

A participant also asked if the subscription model as has been piloted in the United Kingdom and proposed in the United States would be exported to LMICs. Mr. van der Heijden responded that the subscription model as a marketing tool from companies, but may be useful for HICs. For LMICs, it would need to be adapted. This could be possible through licensing, but would not be linked to the R&D process. SECURE is still looking into reshaping the subscription model and configuring what details would work for their specific context. As part of this, they will turn to economists and universities for consultants for this exercise.

Enabling a transparent and representative process

Anmol Gupta, Member of the Coordinating Committee for Universities Allied for Essential Medicines (UAEM)

Mr. Gupta introduced UAEM as a student-led global organization across more than 20 countries advocating for access to essential medicines, including those developed on university campuses. He outlined four main points of consideration for the SECURE Initiative:

- 1) During the current COVID-19 pandemic, groups like COVAX continue to have little negotiating leverage with manufacturers preventing it from meeting its proposed supply goals. Governments in the Global North have also had little control over their own contracts for vaccine and therapeutic supply negotiated with various manufacturers. This precedent has concerning implications of equity for proposed mechanisms for antibiotic procurement and delivery. The inclusion of clear access provisions in contracts or licenses that SECURE engages and negotiates with manufacturers can go a long way towards ensuring equitable distribution and preventing supply disruptions of antibiotics.
- 2) It is unclear from the current proposal the role that industry will play in SECURE's activities of demand forecasting. Having such roles not explicitly defined risks the creation or appearance of a conflict of interest. As SECURE is further refined, it will be critical for the initiative to define its plans and limit the role of private industry in this process more clearly. Laying out such steps would increase public transparency.
- 3) UAEM has developed an [alternative R&D report](#) cited in the United Nations' 2016 High Level Panel on Access to Medicines report. Within this report, UAEM highlights the strengths and weaknesses of several alternative models of drug development and delivery. Subscription models, as proposed by SECURE, raise concerns of conflict brought about by differences in market opportunity and scope between high volume and low volume countries. The SECURE Initiative must also be transparent on the allocation of capital from paying countries toward SECURE's operational costs. As the initiative grows, the contribution from countries towards SECURE's operational costs may encourage the inclusion of perceived high-volume purchasing countries over low-volume purchasing countries.
- 4) It is also important to acknowledge the important role of faith-based health providers offering essential health care. The role of these groups will be context dependent. However, faith-based providers can help SECURE engage with this network of organizations for financing for procurement as well as for distribution of products within SECURE's portfolio.

Nafis Faizi, Member of People's Health Movement and Assistant Professor of Community Medicine at Aligarh Muslim University, India



Dr. Faizi opened his intervention noting concerns with the lack of stringency around the wide range of stakeholders including industry as well as certain organizations funded by industry. He stated that it was unclear what the operational processes are to ensure that the SECURE Initiative is resilient against all such conflicts of interest. He also expressed concern around how SECURE can optimally engage with not-for-profit civil society organizations.

He then pivoted to the lack of inclusion of diagnostics within the SECURE Initiative, questioning how they could be overlooked when discussing novel antibiotics. He noted that ARC has also focused its

efforts on the Access, Not Excess challenge, which would require sound diagnostic support for stewardship and optimal use of antibiotics. Next, he agreed with SECURE Initiative's focus on addressing low quality and high prices for novel antibiotics, but disagreed that low quality is restricted to LMICs. According to WHO's global surveillance and monitoring report, 21% of falsified and substandard drugs are in the American and European regions, and all WHO regions report the presence of such drugs. The same WHO report also clearly mentions constrained access as one of the reasons for low quality. He noted that COVID-19 had exposed the vulnerability of the supply of essential medicines, particularly generics as well as other intravenous drugs in the U.S, highlighting the need for local production as a solution for limited access and reducing the presence of substandard products. He pointed to the examples of Kerala State Drugs and Pharmaceuticals Limited, which was a public sector effort as well as other local generic companies as being exemplars for possible solutions.

Dr. Faizi then noted the lack of mention of financial access within the draft business model, instead pointing out that the focus within seemed to be restricted to the therapeutic and structural access. He argued that the rationale for fair financing assumes that fair financing for the private sector is the optimal method to solve for availability and affordability, which would create an unfortunate tradeoff where fair financing is pitted against fair access or affordability. He stressed that affordability must be taken into consideration to bring about an optimal solution to the AMR crisis.

Finally, he noted that forecasting and procurement mechanisms including pooled procurement would be essential for rational access to antimicrobials. However, he expressed concern that with the inclusion of a wide range of stakeholders, there would be conflicts of interest from manufacturers in engaging in such efforts and thus, should not be allowed to play such roles. Instead, he recommended that SECURE use the operational costs collected from participating countries to strengthen forecasting and procurement mechanisms without involvement of stakeholders with conflicts of interest.

Reactions from WHO and GARDP and Q&A

Mr. van der Heijden voiced agreement that diagnostics as a method to ensure stewardship should be part of SECURE, but at the moment, they are creating a limited package to work with. For countries who are unable to procure quality drugs, SECURE would treat this similarly to shortages, stepping in and providing drugs, but cannot promise that this will occur. He also provided reassurance that forecasting would never be done together with private sector partner.

Dr. Cohn agreed that there is a high risk of conflict of interest and that they have to be careful about how they engage with partners. She also noted that they are making sure they have external stakeholders in the collaborating countries to help support the selection of antibiotics. This engagement will help direct ways that SECURE can influence the kind of ecosystem of antibiotic access, but it will not be the entire ecosystem of antibiotic access. SECURE will also coordinate and partner with local organizations. Currently, WHO and GARDP are leading SECURE, but this is not meant to continue in the long-term – governance of SECURE will later transition.

A civil society participant noted that WHO and GARDP are also involved in the Center for Global Development's (CGD) AMR Working Group, which includes other stakeholders including from industry. It seemed that this working group was focusing on mobilization of further funding from middle-income countries for the antibiotic market. Given earlier concerns around how financing would be sustained, is SECURE also thinking that middle-income countries could be a rich source of potential for financing

antibiotics? Mr. van der Heijden responded that so far with the CGD process, much of the focus is on minimizing excess and not so much on enabling access. He does want to make sure analysis and emphasis on CGD process is not ignored, but this does not necessarily mean that SECURE will adopt what CGD comes up with. Dr. Cohn also added that it would be important to think through the access and economic or payment models and the need for such models across different economic and health systems.

Another participant in a follow-up question asked how SECURE will ensure that civil society organizations are funded by industry do not become the voice for their industry donors in their engagement with stakeholders. Mr. van der Heijden stated that SECURE would follow WHO's clearance process for civil society organizations. Additionally for industry stakeholders, SECURE in consulting with companies will follow similar procedures.

Briefing from GARDP on joint licensing agreement in collaboration with CHAI with Shionogi for cefiderocol

Dr. Jennifer Cohn, Infectious Diseases Physician and Global Access Project Leader at GARDP



Dr. Cohn opened her presentation noting that the GARDP has separate access projects in addition to SECURE. She highlighted two trends in antibiotic access – 1) the limited number of antibiotics registered in LMICs between 1999-2014 and 2) growing antibiotic resistance, particularly that of carbapenem-resistant *Acinetobacter baumannii* in Latin America, Asia, and parts of Africa as well as carbapenem-resistant *Klebsiella pneumoniae* in South Asia. She then outlined GARDP's approaches to solutions for antibiotic development and access centered around four key areas: accelerating R&D while securing access, making antibiotics accessible for appropriate use post-approval, treating sepsis and sexually transmitted infections, and targeting the deadliest pathogens. In securing access, GARDP considers four pillars – namely, that access should be comprehensive, rapid, sustainable, and integrated through collaborations with local and global actors.

Dr. Cohn then delved into the details of the recently negotiated license between GARDP and CHAI with Shionogi, Inc. for the novel antibiotic, cefiderocol. This is the first license agreement for an antibiotic for the treatment of serious bacterial infections between a non-profit organization and pharmaceutical company driven by public health priorities – namely, that the agreement between parties is for a non-exclusive that can be sub-licensed to develop, manufacture, and commercialize the drug in a license territory. She noted that cefiderocol targets bacteria labelled priority pathogens in urgent need of novel treatments by the WHO and the U.S. Centers for Disease Control and Prevention. It has been approved

by the U.S. Food and Drug Administration and European Medicines Agency and is included on the WHO Model List of Essential Medicines.

The license territory under the agreement includes all low-income countries, most lower middle- and upper middle-income countries, and select high-income countries, accounting for 135 countries in total or 70% of the countries worldwide. The license also includes technology transfer provisions and if a manufacturer utilizes these provisions, any manufacturing process improvement intellectual property that cannot be separated from cefiderocol belongs to Shionogi with a back license to the manufacturer and GARDP. However, if the manufacturer does not take technology transfer, then any manufacturing process improvement intellectual property is retained by the manufacturer with back license to GARDP and Shionogi. As part of the technology transfer, Shionogi will play a hands-on role with manufacturer. Additionally, this will include not just reference rights, but the potential to use the clinical dossier for regulatory purposes.

Shionogi will continue to retain ownership of any intellectual property from clinical development that can subsequently be back licensed to GARDP. Shionogi must approve any further clinical development and can review publications, including raising data and analytic concerns, but cannot unilaterally block publication. Shionogi must approve any sub-licensees, but will not be involved in the selection, review, and discussions. Manufacturing of co-formulation is not considered acceptable.

Dr. Cohn then concluded by noting the significance of the license. Medically, cefiderocol addresses resistant bacteria that are included in the WHO Priority Pathogens List. Cefiderocol has in vitro activity against metallo-beta-lactamases. Moreover, in many countries, particularly in LMICs, there are no options for carbapenem-resistant organisms, or only colistin so this would offer another alternative. She emphasized again that this is the first license to a non-profit entity for antibiotic access, which also includes provisions for stewardship. The license was also developed with recognition of the current regulatory environment, especially in a non-donor funded environment where cefiderocol has not been registered in many countries. Finally, this also has strategic significance in successfully negotiating a license with Shionogi, which is one of the few mid- or large pharmaceutical companies with an antibiotic development portfolio with an extensive license territory including those countries with the highest AMR burden.

Civil society perspective on licensing agreement

Manuel Martin, Infectious Disease Policy Advisor for the Médecins Sans Frontières Access Campaign



Dr. Martin opened his presentation acknowledging the need for a license for cefiderocol given that many of the patents covered by this agreement had already been granted. He also noted that as the agreement includes a broad scope of licensed rights in the context of patent persecution, this could be attractive for generic manufacturers in reducing their legal

risks. However, the broad scope may also have a downside in that it includes many forms of patent evergreening, which could discourage legal challenges to these practices. He also noted that while the license does allow for manufacturing outside of the licensed territory as long as the supply produced is only for the territory, the agreement also includes a non-diversion clause, preventing parallel importation.

Dr. Martin also noted the extensive coverage of the license, which he remarked is better than many similar prior licenses. He also stated that most of the HICs included are small island nations without production capacity except for Chile and Uruguay. Among the many upper middle-income countries included, several have production capacity and are countries with significant AMR. Of the lower middle-income countries and low-income countries, there are those that have manufacturing capacity and also would not have to pay a royalty. He also remarked that the tiered royalty rates for HICs and upper middle-income countries are consistent or lower than that of prior agreements.

He also applauded the inclusion of language in the license to obligate the licensor to conduct technology transfer with licensees on request of GARDP, unlike other previous agreements, which may help overcome barriers for entry for manufacturers who would like to request technology transfer. He also cautioned that the benefit and risk balance of the implications of accepting technology transfer on the independence of the sublicensees as well as ownership of manufacturing process intellectual property is clear to all potential sublicensees. Dr. Martin also highlighted that the included definition of the stringent regulatory authority within the license is confusing as it includes WHO's maturation level standards, which is meant to replace the stringent regulatory authority concept in the coming years. Thus, the license should distinguish between the two standards and acknowledge a transition period where both may be useful.

Finally, across a variety of different aspects included in the license, Dr. Martin also pointed out that Shionogi has a relatively high level of involvement, which gives the company a great deal of control over the actions of the sublicensees (acknowledging the expectation that the company acts in good faith). This coupled with no set timelines or consequences for fairly to perform technology transfer does highlight some risks if assumed trust underlying the license is broken. He also called for the market access plan and collaboration agreement, distinct from the license itself, but would include key aspects of access and stewardship to be made publicly available as soon as possible as they have not yet been published.

Reactions from GARDP and Q&A

A civil society participant posed a question regarding the rationale behind China and Thailand being excluded from the cefiderocol licensing agreement. Dr. Cohn responded that given Shionogi's regional presence, China and Thailand will remain in Shionogi's territory. It was also further noted that with COVID-19, the technology transfer hubs have faced issues in successfully being able to get companies on board to participate in technology transfer. The SECURE Initiative is aware that they are getting this done voluntarily under the cefiderocol license. Another question was asked on who would have rights to the data from continued clinical studies from agreement. Dr. Cohn responded that GARDP would have rights to the data from research, but if the intellectual property was used for commercial use such as a

supplemental indication approval, then that would be owned by Shionogi with a back license to GARDP. However, she posited that the risk of developing new intellectual property would be low.

Conclusion of Teleconsultation

Dr. Ramachandran thanked the presenters including WHO and GARDP for their comprehensive briefings and detailed answers to questions posed as well as ARC members and other partner organizations who provided in-depth interventions around critical issues related to the SECURE draft business model and cefiderocol license agreement. She expressed her hope that this rich discussion with GARDP and WHO would be continued in continuing to provide a diverse range of perspectives and experience from ARC members and others as the SECURE Initiative continues to evolve and become operational and as the cefiderocol license agreement is implemented. Mr. van der Heijden and Dr. Cohn also thanked ARC members and partner organizations for their feedback and acknowledged the need for continued discussions in guiding their ongoing work.