Project Brief

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Swiss Forum on Foreign Policy

Antimicrobial Resistance: The silent pandemic

January 2025

AMR: What role for Switzerland?

Alicia Blair · Irène Ngah · Maximilian Rau · Elena Sommaruga

Executive summary

La résistance aux antimicrobiens (RAM) représente un défi majeur pour la santé mondiale, provoquant environ 5 millions de décès par an. Ce document, qui s'appuie sur les contributions et les idées partagées par des expert·e·s lors d'une table ronde, propose trois visions clés pour lutter contre la RAM d'ici à 2030, ainsi que des recommandations politiques concrètes.

Vision 1 : intégrer la RAM dans les politiques de santé suisse et mondiale

D'ici à 2030, la Suisse intégrera pleinement la résistance aux antimicrobiens dans ses politiques nationales et étrangères de santé, grâce à une stratégie révisée sur la résistance aux antimicrobiens (StAR 2.0). Cette stratégie actualisée intègre l'approche « Une seule santé », qui aborde la RAM en tenant compte de l'interconnexion entre la santé humaine, la santé animale et la santé environnementale. La Suisse joue un rôle de leader dans les partenariats internationaux, partageant son expertise pour lutter contre la RAM à l'échelle mondiale. Genève, en tant que plaque tournante de la diplomatie en matière de santé mondiale, facilitera ces efforts en renforçant les collaborations avec des organisations internationales telles que FIND. En outre, la Suisse investira dans le développement de nouveaux antibiotiques par le biais de mécanismes financiers soutenus par la loi révisée sur les épidémies.

Vision 2 : développer des modèles de financement pour la création et la fourniture d'antibiotiques

Les défis économiques liés à la mise au point de nouveaux antibiotiques, en raison de leurs coûts élevés et de leur faible rentabilité, nécessitent des solutions innovantes. D'ici à 2030, la Suisse teste de nouveaux modèles de financement combinant des mécanismes « push » (incitations initiales telles que des subventions

de recherche et de développement) et «pull» (récompenses après le développement), afin d'encourager le développement durable d'antibiotiques. Ces modèles visent à garantir un accès équitable aux antibiotiques tout en réduisant le développement de la résistance. La Suisse collaborera avec les pays en développement pour partager les enseignements tirés et adapter ces modèles à leurs besoins spécifiques. Vision 3 : garantir une chaîne d'approvisionnement durable en antibiotiques

La Suisse est confrontée à des pénuries croissantes de médicaments, en raison des perturbations de la chaîne d'approvisionnement mondiale et de sa dépendance envers la production étrangère. D'ici 2030, le système centralisé de gestion des stocks d'antibiotiques sera modernisé, renforçant ainsi la sécurité de l'approvisionnement. Ce modèle intégrera des collaborations transfrontalières pour stabiliser les chaînes d'approvisionnement. Il sera soutenu par des incitations, des stratégies de stockage et des collaborations avec des producteurs pharmaceutiques clés.

Recommandations politiques

- **Partager les apprentissages au niveau mondial** : la Suisse devrait intégrer la RAM dans sa politique étrangère de santé, en formant des partenariats pour partager les connaissances et les meilleures pratiques.

- **Encourager des modèles alternatifs pour la création et la distribution des antibiotiques** : collaborer avec les institutions de recherche et l'industrie pharmaceutique pour piloter de nouvelles structures d'incitation au développement d'antibiotiques.

- **Renforcer la gestion de la chaîne d'approvisionnement :** centraliser et améliorer les systèmes de stockage et d'approvisionnement en antibiotiques pour atténuer les pénuries.

Conclusion

La RAM constitue une menace mondiale croissante, mais la Suisse est bien placée pour jouer un rôle de premier plan dans la résolution de ce problème. Grâce à la coopération internationale, à des modèles financiers innovants et à des stratégies d'approvisionnement, la Suisse peut contribuer à garantir un accès continu à des antibiotiques efficaces et à réduire le risque de futures pandémies.

1. Introduction

Antimicrobial resistance (AMR), sometimes referred to as a silent pandemic, is estimated to be the direct cause of 1.3 million deaths per year and associated with additional 5 million deaths per year (WHO, 2023). AMR affects countries across all regions and income levels, and its causes and consequences are exacerbated by poverty and inequality. AMR develops when bacteria, but also viruses, fungi, and parasites, evolve and become resistant to medications that once worked against them. This makes infections more difficult to treat, raising the chances of disease transmission, severe illness, and death. The spread of AMR is mainly driven by misuse and overuse of antibiotics in humans, animals and the environment. Consequently, antibiotics and other antimicrobial technologies lose their efficacy and the treatment of infections becomes increasingly difficult or even impossible. Limiting the use of antibiotics is a crucial step in the fight against antimicrobial resistance, but this alone is often not enough. Studies have also highlighted the need to develop new antibiotics to treat infections caused by resistant bacteria. This is because resistant pathogens are evolving and continue to spread while older antibiotics are becoming less effective.

Although Switzerland has a relatively low rate of deaths associated with AMR (IHME, 2022) the issue remains a global challenge with multilateral organisations such as the World Health Organisation (WHO) urging member states to speed up the enactment of national action plans and taking further steps to restrict AMR. While such a plan has already been introduced on a national level (Strategy on Antimicrobial Resistance, StAR), Switzerland, with its long tradition of multilateral diplomacy and high level of expertise in Global Health issues is optimally placed to support the WHO and other key players on the international level in fighting against AMR and create a coalition of the willing to develop sustainable solutions to curb this silent pandemic.

Project context and methodology

In spring 2024, foraus invited 18 experts[1] from academia, politics, the federal administration, and the private sector to discuss and provide input and ideas to create three recommendations for Swiss decision-makers to focus on. The results are presented in three visions of the year 2030 where Switzerland (a) has successfully integrated AMR measures into its Health Foreign Policy, (b) implemented alternative models of developing and remunerating critical antibiotics to ensure their availability, and (c) created a sustainable system for the supply of antibiotics.

1 The list of participants can be found at the end of the Policy Brief

2. Three visions for a Swiss impact when combating AMR

Vision 1: Switzerland successfully integrates AMR measures into its Health Foreign Policy

By 2030, Switzerland has effectively integrated AMR measures into its national and foreign health policies. Recognising the necessity of a nationally coordinated approach to limit the spread of AMR, Switzerland already established a national AMR strategy, Strategy on Antimicrobial Resistance (StAR), in 2016. By 2030, the Federal Office of Public Health (FOPH) together with the Federal Food Safety and Veterinary (FSVO), the Federal Office for Agriculture (FOAG) and the Federal Office for the Environment (FOEN) will have introduced a revised strategy, StAR 2.0, incorporating lessons learned and adapting its approach while aligning with global guidelines such as the by then concluded Pandemic Treaty. StAR 2.0 integrates the One Health Approach to not only address it from a human but also from an animal and environmental health perspective. This revised strategy evaluates and measures the effectiveness of the One Health approach, as highlighted in the recently released action plan from June 2024 (Federal Council, 2024). The strategy reflects the outcomes and impacts of previous efforts and establishes an evaluation framework with clear metrics. Following recommendations outlined by the Quadripartite (WHO, FAO, OIE, and UNEP) in the One Health Joint Action Plan (WHO et al., 2022), created to advance the four organisations' response to AMR, the national strategy aligns with international AMR discussions. As mentioned in the introduction, AMR is not only an issue within Switzerland but it also transcends borders. Switzerland acknowledges the importance of integrating AMR measures into its Health Foreign Policy (GAP 2028-2033), aiming to assist other countries and share insights on stewardship and the One

Health approach. Additionally, Switzerland has created a network to exchange information with key contacts in other countries and regions, facilitating collaborative efforts in combating AMR globally. It strengthened its position through International Geneva by entering partnerships with organisations focusing on combating AMR such as FIND. Switzerland commits itself to ensure that all voices within WHO and outside have a place when it comes to the needs and use of antibiotics.

Finally, Switzerland has successfully adopted the Revised Epidemics Act which provides a legal framework to, on the one side, implement alternative models for remunerating the provision of antibiotics in Switzerland (art. 51a). On the other side, it allows for contributing funds (art. 50a) to support development efforts of antibiotics through international initiatives such as the Global Antibiotic Research and Development Partnership (GARDP) or Combating Antibiotic-Resistant Bacteria Biopharmaceutical Accelerator (CARB-X).

Infobox: AMR and One Health

Antimicrobial resistance (AMR) exemplifies the One Health approach, which acknowledges the interconnected and interdependent nature of human, animal, and environmental health. Addressing AMR requires a comprehensive strategy engaging various sectors to control emerging threats (WHO, 2021). AMR arises from excessive use of antimicrobials in agriculture, livestock, and human medicine, through which bacteria develop resistance genes and mobile genetic elements that can transfer to other bacteria, regardless of genus. Bacteria with antimicrobial resistance can proliferate more easily across animals, humans, and the environment. Factors like poor antimicrobial management, inadequate infection control, agricultural waste, environmental contaminants, and the movement of infected individuals and animals contribute to the spread of resistance (Velazquez-Meza et al., 2022).

Vision 2 : Switzerland implements alternative funding models for developing and supplying antibiotics

As of 2024, research and development of new antibiotics remains a challenge. From an economic perspective, developing antibiotics provides only low profitability as the use of older antibiotics is maintained to treat most infections while the primary value of new antibiotics lies in treating multidrug-resistant infections and combating emerging pathogens. However, due to the accelerated development of resistance, new antibiotics are reserved as a last resort, leading to low sales volumes. (Outterson et al., 2020) Furthermore, antibiotics generate low revenues as the treatment courses are short and resistance limits the effective lifespan of antibiotics. (Dutescu and Hillier, 2021) Another issue is the tension between stewardship[1] and equitable access: Everyone should have access to antibiotics while avoiding overuse to limit the rate of resistance. To promote the development and supply of antibiotics, two general strategies are being followed: push and pull. Push incentives, such as grant funding or tax credits for investments in R&D, aid research by advancing new compounds through trials up to the approval stage. On the other hand, pull incentives, such as subscription models (Polek et al., 2024) or milestone or end prizes, come into play afterward, helping companies stay afloat until they begin generating revenue (McKenna, 2024).[2]
By 2030, Switzerland has tested and piloted different funding and remuneration models for developing new antibiotics. Switzerland continues to share its experiences and lessons through its projects with the Swiss Development Cooperation (SDC) while also highlighting how push and pull strategies can be effectively combined in developing countries.

1 Stewardship concerns all measures preventing the inappropriate use of antibiotics. Some examples are raising awareness through training and education or optimised use of antibiotics in humans and animals.
2 Further reading: WTO, WIPO, WHO 2020. Promoting Access to Medical Technologies and Innovation, 2nd Edition. pp. 138-165 https://www.wipo.int/edocs/pubdocs/en/wipo_pub_628_2020.pdf

Vision 3 : Switzerland overcomes shortages in antibiotics

Drug shortages are increasing globally. Switzerland as a small country is also affected, particularly in the hospital and outpatient care sector. Drug shortages arise from several interconnected factors. Economic pressures and looser regulations in low-wage countries have driven the globalisation of the pharmaceutical industry, leading to the relocation of key production elements, such as active ingredients, to places like China and India. This concentration of production among a few companies has increased vulnerabilities, especially when global supply chains are disrupted. Practices like Just-in-Time delivery further reduce stockpiles, leaving little room for error. Shocks in the international supply system such as the COVID-19 pandemic have led to events like China's Zero-COVID policy and India's subsequent halt on drug exports have worsened the situation. Additionally, the Swiss market is small and less economically attractive for global pharmaceutical companies. Finally, there is a fluctuating global demand making it difficult for pharmaceutical companies to respond quickly. (BAG, 2024) By 2030, Switzerland aims to resolve its national supply issues of pharmaceuticals through a comprehensive system covering both the human and animal sectors while collaborating across borders. With regard to antibiotics, this means efficiently implementing pull-incentive models to remunerate critical antibiotics in Switzerland. This system continues to include a stockpiling mechanism that has been updated with the insights gathered through the analysis of supply disruptors (BAG and BWL, 2024). Switzerland has also initiated collaborations with major drug-producing countries like India to enhance supply chain security.

By 2030, the success of the stockpiling system has convinced other countries to follow the Swiss example, whereby the FDFA and the FOPH supported through the Federal Office for National Economic Supply (FONES) serve in a guidance role for other countries especially in low and middle income countries.

3. Policy recommendations

To realise the above outlined visions, the following recommendations have been developed:

Recommendation 1: Sharing lessons

- Integration of AMR measures as an action field into Swiss Health Foreign Policy (GAP)
  Lead: FOPH, FSVO, FOAG, FOEN and FDFA

- Conclusion of partnerships with countries or creation of a network on AMR where synergies with other health topics such as nosocomial infections are used to provide lessons learnt and experiences for other countries as well as Switzerland
  Lead: FOPH and FDFA

- Adoption of the Revised Epidemics Act in order to provide financial resources for international initiatives focusing on developing new antibiotics
  Lead: Federal Council and Federal Assembly

Apart from the detailed recommendations above, it is also advisable that the FOPH intensifies its efforts to raise public awareness in Switzerland about the importance of combating AMR both nationally and globally.

Recommendation 2: Alternative funding models for antibiotics

- Collaboration between Federal Office of Public Health (FOPH), research institutions, healthcare personnel, patient organisations and pharmaceutical industry to assess needs and develop an appropriate incentive model for remuneration of critical new and older antibiotics in Switzerland
  Lead: FOPH

- Piloting of different pull-incentive models in Switzerland
  Lead: FOPH

- Collaboration with WHO as well as non-profit initiatives such as GARDP to adapt experiences and expand the patent system with insight from lessons learnt for lower income settings while committing to provide financial support for international efforts to develop antibiotics
  Lead: Swiss Mission to the UN in Geneva and Swiss Development Cooperation (SDC)

Recommendation 3: Ensuring sustainable antibiotics supply

- Development of a strategy based on an OH approach to safeguard antibiotic stocks in Switzerland while including pull incentive model
  Lead: FOPH, FSVO, FOAG, FOEN, FONES

- Collaboration with EU and countries with pharmaceutical industries to increase security of supply of medicines and in particular antibiotics
  Lead: FOPH and FDFA

- Initiating a discussion internationally on best practices for stockpiling systems and share lessons learned
  Lead: FOPH and FDFA, specifically SDC

4. Conclusion

The silent pandemic of antimicrobial resistance is a significant global health threat. Furthermore, the COVID-19 pandemic has significantly impacted the landscape of AMR, highlighting the urgent need to limit its spread while ensuring access to effective antibiotics (Polemis et al., 2021). In 2021, AMR was associated with an estimated 4.71 million deaths worldwide (Lancet, 2024). By 2050 this number could increase to up to 10 million deaths annually (UNEP, 2023). The visions and recommendations presented in this paper are interconnected, with various aspects recurring throughout, emphasising the complexity of AMR from its development to the ongoing efforts to combat it. This highlights the importance of specific factors that play a critical role in addressing AMR, both nationally and internationally. As mentioned earlier, AMR is not merely a health issue that can be resolved within national borders; it requires discussion and collaboration on a global scale to effectively limit its impact. Switzerland, recognising the gravity of AMR, has developed a comprehensive Strategy on AMR (StAR) based on the One Health approach. This paper calls on Switzerland to remain committed to stewardship and the development of new antibiotics, leveraging its expertise, experience, and financial resources. Important internationally-led conversations such as the UN General Assembly High-Level on AMR which took place in September 2024, along with ongoing discussions about a Pandemic Instrument at WHO, will provide Switzerland with the necessary momentum to raise awareness about AMR both nationally and internationally, and to reinforce its dedication to combating this pressing issue.

Policy Recommendation 1: Prioritisation of AMR measures in the Swiss health foreign policy, promotion of international partnerships and support of global antibiotic development.

Policy Recommendation 2: Application of alternative incentive models for developing and supplying antibiotics.

Policy Recommendation 3: Development of a comprehensive strategy to overcome shortages in antibiotics

The recommendations presented in this work show that to attain such goals, a major shift in thinking, as well as in the way we organise our lives, interact with the ecosystems that surround us, and traditionally manage health systems, is needed. The visions and ideas presented request a demanding effort, however in the future, they can serve as a way to avoid future crises.

5. Authors and contributors

Authors

Alicia Blair: Alicia has just completed her dual Master's degree in Global Health and International Development Studies at the University of Geneva and the Geneva Graduate Institute. She has gained experience in the field of health system strengthening as well as One Health and pandemic preparedness while working for various NGOs and the public sector.

Editors

Irène Ngah: Irène is a recent master graduate at the University of Geneva and was foraus' project management intern from February to August 2024.

Maximilian Rau: Max is the Head of Projects and Innovation at foraus. He is responsible for the Think Tank's numerous projects and ensures that they follow an innovative methodological approach.

Elena Sommaruga: Elena is a master graduate at the Geneva Graduate Institute, and was foraus' project management and communication intern from August 2024 to February 2025.

Workshop participants

Ideas and inputs in this policy brief were laid out in a workshop in March 2024 in Bern, Switzerland. Present at this workshop were the following experts (affiliations at the time of the workshop):

Peter Beyer	Global Antibiotic Research & Development Partnership (GARDP)
Alicia Blair	foraus, Global Health Fellow
Rudolf Blankart	University of Bern and Swiss Institute for Translational and Entrepreneurial Medicine (sitem-insel)
Joffrey Chadrin	Policy Expert
Christoph Dehio	University of Basel and NCCR AntiResist
Joachim Frey	National Research Programme on Antimicrobial Resistance (NRP 72)
Simon Gottwalt	Federal Office of Public Health
Dagmar Heim	Federal Food Safety and Veterinary Office
Verena Hoberg	Public Health Schweiz
Alexandre von Kessel	Federal Office of Public Health
Ilona Kickbusch	Global Health Centre, Graduate Institute
Ambassador Nora Kronig	Federal Office of Public Health
Stefan Mühlebach	University of Basel, Department of Pharmaceutical Sciences
Oliver Nolte	Institute for Medical Microbiology, UZH
Angélie Pham	University Basel SPEARHEAD
Barbara Weil	Division Public Health, Swiss Medical Association (FMH)

6. Endnotes

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7. List of abbreviations

FDFA: Federal Department of Foreign Affairs / Eidgenössisches Departement für auswärtige Angelegenheiten / Département fédéral des affaires étrangères

FOAG: Federal Office for Agriculture / Bundesamt für Landwirtschaft / Office fédéral de l'agriculture

FOEN: Federal Office for the Environment / Bundesamt für Umwelt / Office fédéral de l'environnement

FONES: Federal Office for National Economic Supply / Bundesamt für wirtschaftliche Landesversorgung / Office fédéral pour l'approvisionnement économique du pays

FOPH: Federal Office of Public Health / Bundesamt für Gesundheit / Office fédéral de la santé publique

FSVO: Federal Food Safety and Veterinary Office / Bundesamt für Lebensmittelsicherheit und Veterinärwesen / Office fédéral de la sécurité alimentaire et des affaires vétérinaires

SDC: Swiss Agency for Development and Cooperation / Direktion für Entwicklung und Zusammenarbeit / Direction du Développement et de la Coopération

Citation
Blair, A., Ngah, I. (Eds.), Rau, M. (Eds.), Sommaruga, E. (Eds.) (2025). AMR: What role for Switzerland?. Bern: foraus - Forum Aussenpolitik

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foraus – Forum Aussenpolitik | Marktgasse 36 | 3011 Bern
office@foraus.ch | +41 44 501 68 65

foraus – Forum de politique étrangère | c/o Impact Hub
Rue Fendt 1 | 1201 Genève
office@foraus.ch | +41 77 532 44 64

IBAN: CH06 0900 0000 6017 6892 9

AMR: What role for Switzerland?

This report presents the outcome of a participatory strategic discussion organised by foraus assembling relevant stakeholders in an open exchange on the global combat against antimicrobial resistance and the role of Switzerland in this fight. By taking an anticipatory approach, we envisioned three alternative futures, possible versions of the world in 2030, which could set the political course of our preferred future today by presenting transformative changes in the domains of multilateral partnerships, research & development, and presenting an innovative system of stockpile management.