

AMRIWA (ANTIMICROBIAL RESISTANCE IN WEST AFRICA) OCCURRENCE, SOURCES AND PREVENTION OF ANTIMICROBIAL RESISTANCE IN WEST AFRICA – FOLLOWING THE FLOW OF AMR GENES BETWEEN HUMANS, ANIMALS AND ENVIRONMENT

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Antimicrobial resistance (AMR) is a global threat to human health. It has increased rapidly, especially in developing countries, which lack controlled antibiotic policy, and have poor infrastructures, which enable the flow of AMR genes between the environment, animals and humans. The struggle against AMR calls for novel tools, which only can be found through deeper understanding of the flow of AMR genes across the community. Our AMRIWA consortium focuses on the flow of AMR genes in West Africa, a region with extensive gaps in data, joining environmental, microbiological, sociological, and medical expertise to explore the evolving and transfer of AMR genes between water, soil, animals, food, and humans; using the so called 'One Health' approach. We will combine the key knowledge of the West African researchers to the new methods of Finnish researchers.

In 2018-2019 we concentrate on collecting various types of microbiological samples and processing them in Benin, Burkina Faso and Mali. Sociologists conduct interviews, focus groups, observational site visits and document analyses. Local laboratory practices and expertise in microbiology and sociology are developed through several visits of the Finnish partners to Africa and the African partners to Finland. In 2020-2021 the samples (over 3000 collected) are further analysed in Finland. Students from the partner countries in Africa will participate this lab work in order to learn new molecular biology and bioinformatic techniques. In AMRIWA, we combine exploring occurrence of various AMR genes in the environment and generating understanding of the social practices that drive their spread. Various dissemination and outreach activities to increase the awareness of the problems caused by AMR and its prevention in the African countries are carried out. Thus, the impact of the project will extend beyond academia, contributing to national and international AMR policies and public understanding of AMR.

The aims of AMRIWA:

- To determine the occurrence and sources of AMR in West Africa
- To follow the flow of AMR genes between humans, animals and environment
- To use DNA-based research methods also in Africa
- To support prevention of the spread of AMR
- To provide African students and researchers opportunities for study visits and capacity building

In AMRIWA we explore AMR gene flow using the following most advanced research methods:

- Microbiological methods: Metagenomics, SmartChip quantitative PCR, Epic-PCR, culturing and whole-genome sequencing of clinical pathogens, sequencing DNA directly from enriched environmental samples
- Sociological methods: Interviews, observation, participatory visuals



Lab work in Abomey-Calavi, Benin

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