Tackling antimicrobial resistance programme

Fleming Fund online learning

To access the programme online, scan the QR code or visit:

open.edu/openlearncreate/AMR

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Overview

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1 professional programme

10 learning pathways

29 courses

1 toolkit

The Tackling Antimicrobial Resistance programme offers 29 online courses across 10 learning pathways. The programme, developed by The Open University for the Fleming Fund, is designed to help you develop and apply skills relevant to your role in tackling antimicrobial resistance (AMR).

Courses are designed for use in low IT bandwidth environments. They include video segments, diagrams and numerous opportunities to check your learning through interactive quizzes and reflective activities. Most take around 6 hours to complete, but you can work through them at your own pace.

You do not need to study every course. Choose the ones that best match your role, responsibilities and personal learning goals. Courses are flexible and can be taken in any order.

Upon completing a course you will receive a Statement of Participation to print and a digital badge to share on platforms like LinkedIn, Facebook, X (Twitter), or BlueSky.

Upon completing a learning pathway, you will receive a Certificate of Completion to print. Pathways consist of several courses and are tailored to key clinical, veterinary, laboratory and leadership roles.

In addition the programme includes the AMR surveillance toolkit, which supports healthcare teams in improving collaboration and developing effective strategies to combat AMR.

Take these seven steps to help tackle AMR:

1. **Complete a registration form** – help us to get to know you better and understand how this programme can support your learning about AMR. You only need to complete this once.
2. **Identify your learning goals** – take the first course, AMR surveillance and you, to plan your learning pathway.
3. **Select your learning pathway** – according to your professional role.
4. **Claim your Statement of Participation and digital badge for each course** – complete a course, take the quiz and complete the course satisfaction survey to claim each one.
5. **Claim your Fleming Fund pathway Certificate of Completion** – complete all courses in your pathway to claim a Certificate of Completion.
6. **Use the AMR surveillance toolkit** – select one or more of the tools and resources to use with colleagues and make informed decisions.
7. **Tell us what you think** – complete the Feedback Form to help us understand how effective the programme was for you and what else we could do to support your learning at work around AMR.

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Pathways

Pathways

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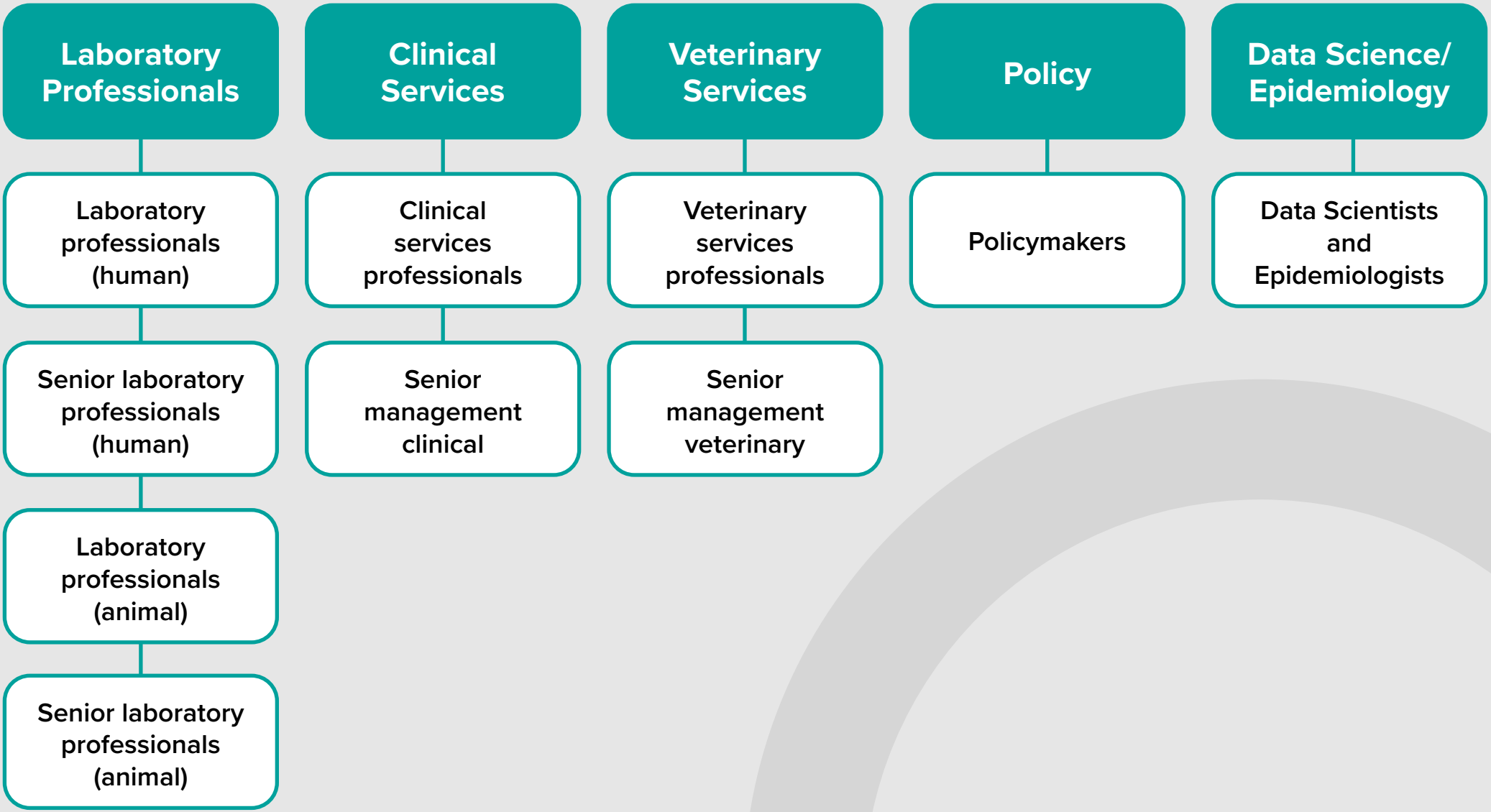
Choose one of ten learning pathways consisting of several courses to earn a Certificate of Completion



Pathway requirements

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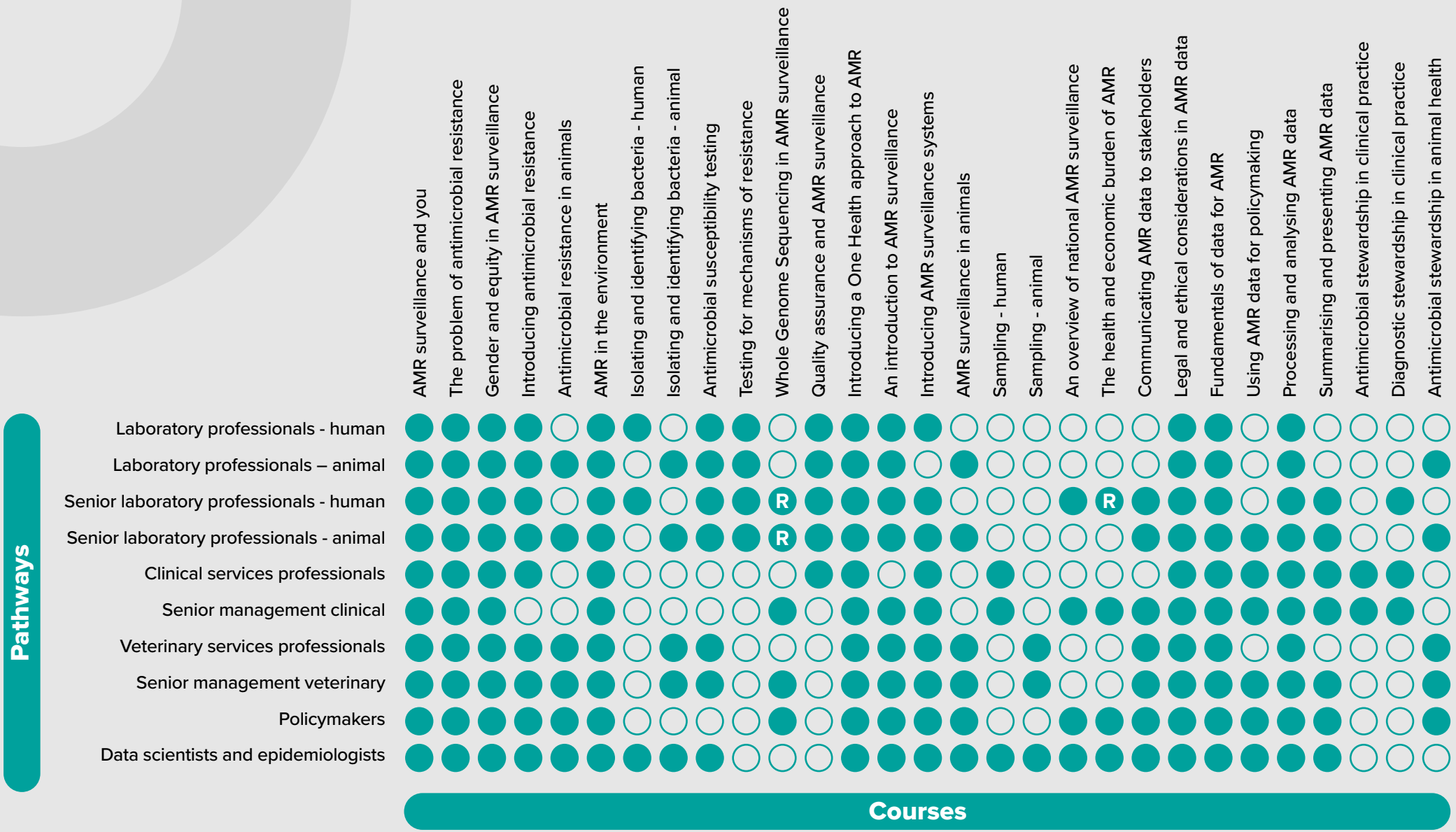

R = recommended optional course – not part of the certificate for that pathway

Laboratory professionals pathways – human health

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Laboratory professionals in human health pathway

This pathway is aimed at laboratory technicians or assistants, technologists and laboratory scientists in the human health sector. In the courses of this pathway, you will learn about good laboratory practice and management, the One Health approach to tackling AMR, surveillance in AMR, and the processing, analysis and use of AMR data.

This pathway comprises 15 courses which are recommended to be studied in the following order but can be studied in any order:

- AMR surveillance and you.
- The problem of AMR.
- Gender and equity in AMR surveillance.
- Introducing AMR.
- AMR in the environment.
- Isolating and identifying bacteria (human health).
- Antimicrobial susceptibility testing.
- Testing for mechanisms of resistance.
- Quality assurance and AMR surveillance.
- Introducing a One Health approach to AMR.
- An introduction to AMR surveillance.
- Introducing AMR surveillance systems.
- Legal and ethical considerations in AMR data.
- Fundamentals of data for AMR.
- Processing and analysing AMR data.

Explore this pathway

Senior laboratory professionals in human health pathway

This pathway is aimed at heads or managers of a laboratory or heads of unit in the human health sector. In the courses of this pathway, you will learn about good laboratory practice and management, the One Health approach to tackling AMR, surveillance in AMR including national surveillance systems, and the processing, analysis and use of AMR data and antimicrobial stewardship in the human health sector. This pathway comprises 19 essential and 2 optional courses which are recommended to be studied in the following order but can be studied in any order:

- AMR surveillance and you.
- The problem of AMR.
- Gender and equity in AMR surveillance.
- Introducing AMR
- AMR in the environment.
- Isolating and identifying bacteria (human health).
- Antimicrobial susceptibility testing.
- Testing for mechanisms of resistance.
- Quality assurance and AMR surveillance.
- Introducing a One Health approach to AMR.
- An introduction to AMR surveillance.
- Introducing AMR surveillance systems.
- An overview of national AMR surveillance.
- Communicating AMR data to stakeholders.
- Legal and ethical considerations in AMR data.
- Fundamentals of data for AMR.
- Processing and analysing AMR data.
- Summarising and presenting AMR data.
- Diagnostic stewardship in clinical practice.
- Whole Genome Sequencing in AMR surveillance (recommended).
- The health and economic burden of AMR (recommended).

Explore this pathway

Laboratory professionals pathways – animal health

Laboratory professionals in animal health pathway

This pathway is aimed at laboratory technicians or assistants, technologists and laboratory scientists in the animal health sector. In the courses of this pathway, you will learn about good laboratory practice and management, the One Health approach to tackling AMR, surveillance in AMR, the processing, analysis and use of AMR data and antimicrobial stewardship in the animal sector.

This pathway comprises 17 courses which are recommended to be studied in the following order but can be studied in any order:

- AMR surveillance and you.
- The problem of AMR.
- Gender and equity in AMR surveillance.
- Introducing AMR.
- AMR in animals.
- AMR in the environment.
- Isolating and identifying bacteria (animal health).
- Antimicrobial susceptibility testing.
- Testing for mechanisms of resistance.
- Quality assurance and AMR surveillance.
- Introducing a One Health approach to AMR.
- An introduction to AMR surveillance.
- AMR surveillance in animals.
- Legal and ethical considerations in AMR data.
- Fundamentals of data for AMR.
- Processing and analysing AMR data.
- Antimicrobial stewardship in animal health.

Explore this pathway

Senior laboratory professionals in animal health pathway

This pathway is aimed at heads or managers of a laboratory or heads of unit in the animal health sector. In the courses of this pathway, you will learn about good laboratory practice and management, the One Health approach to tackling AMR, surveillance in AMR including national surveillance systems, the processing, analysis and use of AMR data and antimicrobial stewardship in the animal health sector.

This pathway comprises 22 courses which are recommended to be studied in the following order but can be studied in any order:

- AMR surveillance and you.
- The problem of AMR.
- Gender and equity in AMR surveillance.
- Introducing AMR.
- AMR in animals.
- AMR in the environment.
- Isolating and identifying bacteria (animal health).
- Antimicrobial susceptibility testing.
- Testing for mechanisms of resistance.
- Quality assurance and AMR surveillance.
- Introducing a One Health approach to AMR.
- An introduction to AMR surveillance.
- Introducing AMR surveillance systems.
- AMR surveillance in animals.
- Communicating AMR data to stakeholders.
- Legal and ethical considerations in AMR data.
- Fundamentals of data for AMR.
- Using AMR data for policy making.
- Processing and analysing AMR data.
- Summarising and presenting AMR data.
- Antimicrobial stewardship in animal health.
- Whole Genome Sequencing in AMR surveillance (recommended).

Explore this pathway

Clinical services pathways – human health

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Clinical services professionals

This pathway is aimed at clinicians, nurses, pharmacists and clinical officers. In the courses of this pathway, you will learn about the One Health approach to tackling AMR, surveillance in AMR, the processing, analysis, summarising, presenting and use of AMR data and antimicrobial stewardship in clinical services.

This pathway comprises 16 courses which are recommended to be studied in the following order but can be studied in any order:

- AMR surveillance and you.
- The problem of AMR.
- Gender and equity in AMR surveillance.
- Introducing AMR.
- AMR in the environment.
- Quality assurance and AMR surveillance.
- Introducing a One Health approach to AMR.
- Introducing AMR surveillance systems.
- Sampling (human health).
- Legal and ethical considerations in AMR data.
- Fundamentals of data for AMR.
- Using AMR data for policy making.
- Processing and analysing AMR data.
- Summarising and presenting AMR data.
- Antimicrobial stewardship in clinical practice.
- Diagnostic stewardship in clinical practice.

Explore this pathway

Senior management clinical

This pathway is aimed at heads of hospitals, chairs of IPU committees/ drugs and therapeutic/resources and superintendents. In the courses of this pathway, you will learn about the One Health approach to tackling AMR, surveillance in AMR including national surveillance systems, the handling and communication of AMR data and antimicrobial stewardship in clinical services.

This pathway comprises 19 courses which are recommended to be studied in the following order but can be studied in any order:

- AMR surveillance and you.
- The problem of AMR.
- Gender and equity in AMR surveillance.
- AMR in the environment.
- Whole Genome Sequencing in AMR surveillance.
- Introducing a One Health approach to AMR.
- An introduction of AMR surveillance.
- Introducing AMR surveillance systems.
- Sampling (human health).
- An overview of national AMR surveillance.
- The health and economic burden of AMR.
- Communicating AMR data to stakeholders.
- Legal and ethical considerations in AMR data.
- Fundamentals of data for AMR.
- Using AMR data for policy making.
- Processing and analysing AMR data.
- Summarising and presenting AMR data.
- Antimicrobial stewardship in clinical practice.
- Diagnostic stewardship in clinical practice.

Explore this pathway

Veterinary services pathways – animal health

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Veterinary service professionals

This pathway is aimed at veterinarians, para-veterinarians, field/veterinarian officers and veterinarian pharmacists. In the courses of this pathway, you will learn about good laboratory practice and management, the One Health approach to tackling AMR, surveillance in AMR, the fundamentals of AMR data management and its use for communication and antimicrobial stewardship in the animal health sector.

This pathway comprises 18 courses which are recommended to be studied in the following order but can be studied in any order:

- AMR surveillance and you.
- The problem of AMR.
- Gender and equity in AMR surveillance.
- Introducing AMR.
- AMR in animals.
- AMR in the environment.
- Isolating and identifying bacteria (animal health).
- Antimicrobial susceptibility testing.
- Introducing a One Health approach to AMR.
- An introduction to AMR surveillance.
- Introducing AMR surveillance systems.
- AMR surveillance in animals.
- Sampling (animal health).
- Communicating AMR data to stakeholders.
- Legal and ethical considerations in AMR data.
- Fundamentals of data for AMR.
- Processing and analysing AMR data.
- Antimicrobial stewardship in animal health.

Explore this pathway

Senior management veterinary

This pathway is aimed at veterinarians, para-veterinarians, field/ veterinarian officers and veterinarian pharmacists. In the courses of this pathway, you will learn about good laboratory practice and management, the One Health approach to tackling AMR, surveillance in AMR, the fundamentals of AMR data management, how AMR data is communicated and antimicrobial stewardship in the animal health sector.

This pathway comprises 21 courses which are recommended to be studied in the following order but can be studied in any order:

- AMR surveillance and you.
- The problem of AMR.
- Gender and equity in AMR surveillance.
- Introducing AMR.
- AMR in animals.
- AMR in the environment.
- Isolating and identifying bacteria (animal health).
- Antimicrobial susceptibility testing.
- Introducing a One Health approach to AMR.
- Whole Genome Sequencing in AMR surveillance.
- An introduction to AMR surveillance.
- Introducing AMR surveillance systems.
- AMR surveillance in animals.
- Sampling (animal health).
- Communicating AMR data to stakeholders.
- Legal and ethical considerations in AMR data.
- Fundamentals of data for AMR.
- Using AMR data for policymaking.
- Processing and analysing AMR data.
- Summarising and presenting AMR data.
- Antimicrobial stewardship in animal health.

Explore this pathway

Data & policymaking pathways

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Policymakers

This pathway is aimed at members of the AMR Secretariat, government departments of health/agriculture/livestock/fisheries, and representatives from the WHO, FAO and WOAH. In the courses of this pathway, you will learn about the One Health approach to tackling AMR, surveillance in AMR including national surveillance systems, the processing, analysis, summarising, presenting and communication of AMR data and how AMR data can be used for policy making.

This pathway comprises 20 courses which are recommended to be studied in the following order but can be studied in any order:

- AMR surveillance and you.
- The problem of AMR.
- Gender and equity in AMR surveillance.
- Introducing AMR.
- AMR in animals.
- AMR in the environment.
- Whole Genome Sequencing in AMR surveillance.
- Introducing a One Health approach to AMR.
- An introduction to AMR surveillance.
- Introducing AMR surveillance systems.
- AMR surveillance in animals
- An overview of national AMR surveillance.
- The health and economic burden of AMR.
- Communicating AMR data to stakeholders.
- Legal and ethical considerations in AMR data.
- Fundamentals of data for AMR.
- Using AMR data for policy making.
- Processing and analysing AMR data.
- Summarising and presenting AMR data.
- Antimicrobial stewardship in animal health.

Explore this pathway

Data scientists & epidemiologists

This pathway is aimed at data scientists and epidemiologists. In the courses of this pathway, you will learn about good laboratory practice and management, the One Health approach to tackling AMR, surveillance in AMR including national surveillance systems, the processing, analysis, summarising, presenting and communication of AMR data and how AMR data can be used for policy making.

This pathway comprises 23 courses which are recommended to be studied in the following order but can be studied in any order:

- AMR surveillance and you
- The problem of AMR
- Gender and equity in AMR surveillance
- Introducing AMR
- AMR in animals
- AMR in the environment
- Isolating and identifying bacteria (human health)
- Isolating and identifying bacteria (animal health)
- Antimicrobial susceptibility testing
- Introducing a One Health approach to AMR
- An introduction to AMR surveillance
- Introducing AMR surveillance systems
- AMR surveillance in animals.
- Sampling (human health).
- Sampling (animal health).
- An overview of national AMR surveillance.
- The health and economic burden of AMR.
- Communicating AMR data to stakeholders.
- Legal and ethical considerations in AMR data.
- Fundamentals of data for AMR.
- Using AMR data for policy making.
- Processing and analysing AMR data.
- Summarising and presenting AMR data.

Explore this pathway

AMR surveillance toolkit

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The AMR surveillance toolkit is a resource for managers, team leads, and senior staff in health settings in AMR surveillance networks.

It supports you and your colleagues to learn more about AMR and develop more effective ways of working together to address it. This toolkit is a collection of three main tools.

Each tool includes various tasks that you and your colleagues, as a team, can do to develop new strategies around AMR practice that you can use in your day-to-day work. The three tools are designed to be used in combination with the OU/Fleming Fund online courses, but they can also be used independently from the courses.

View the toolkit

Tool 1: Your role in an AMR surveillance network

Tool 1 includes a number of activities that can help you and your colleagues reflect on your own roles and responsibilities, and the roles of other people. You can also identify gaps in existing roles within your own work setting (such as a local AMR network), understand the contribution of each role to the network and negotiate how you can work together more effectively.

Tool 2: Dealing with AMR data

Tool 2 is designed to help you and your colleagues understand your contribution to data collection and management within AMR surveillance systems and identify areas for improvements in your workplace. By using this tool, you will also have an opportunity to build on your understanding of bias and validity and the interpretation of data from AMR studies.

Tool 3: Reflecting on your work and changing your workplace

Tool 3 encourages you and your colleagues to develop strategies to apply your learning or what you know to day-to-day work. It also helps you to find ways to overcome barriers that delay or stop you as a team from applying your new learning or what you already know.

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Courses

Introductory courses

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AMR surveillance and you

This course will support you to identify the AMR skills needed for your role and help you to identify the courses you need to study. It will bring together reflective, practice-based learning from across courses in the programme.

Learning outcomes include:

- Describe how antibiotic resistance relates to your work.
- Understand what AMR knowledge and skills are required for your role.
- Identify areas where your knowledge and skills require development and plan a strategy to address these skills gaps.
- Know your responsibilities as a learner and the role that learning plays in your professional practice relating to AMR.
- Reflect on how your learning has changed your working practice relating to AMR.

Explore this course

The problem of antimicrobial resistance

This course will introduce the problem of AMR in a global, One Health context. It will introduce the scale and scope of the problem and the factors that contribute to AMR.

Learning outcomes include:

- Define the term ‘antibiotic’ and describe the importance of antibiotics in modern society.
- Explain how the overuse and misuse of antibiotics contribute to bacterial resistance.
- Describe the scale and nature of antibiotic resistance worldwide, and discuss the consequences of a future without antibiotics.
- Explain why the problem of AMR needs a One Health approach.
- Reflect on your own role and those of your colleagues in tackling the AMR crisis.

Explore this course

The Fleming Fund

Introducing antimicrobial resistance

This course will introduce how antibiotics work and how bacteria acquire and transmit resistance. It will highlight examples of resistance mechanisms and pathogen-antimicrobial combinations from animal or human health.

Learning outcomes include:

- Explain how antibiotics work against bacterial pathogens.
- State what is meant by the term ‘antibiotic resistance’.
- Explain that antibiotic resistance evolved to protect bacteria.
- Explain how genetic mutations can give rise to antibiotic resistance that can be inherited.
- Describe the horizontal gene transfer mechanisms that allow antibiotic resistance to be transferred between bacteria.
- Apply scientific terminology when explaining how changes to antibiotic resistance relates to your current work.

Explore this course

Introducing a One Health approach to AMR

This course introduces the concept of One Health and explains the importance of a One Health approach in tackling the AMR crisis. It emphasises how a complex mix of factors involving humans, animals, aquatic species, plants and the environment contribute to the spread of AMR within and between sectors.

Learning outcomes include:

- Explain what is meant by One Health and discuss the importance of this approach in addressing AMR.
- Describe an example of a One Health AMR problem.
- Give examples of measures that can be implemented by different sectors in a One Health approach to controlling an AMR problem.
- Identify the international and national organisational frameworks that support global and national management of AMR.
- Understand the key features of guidelines and protocols available to support a One Health approach to AMR surveillance.
- Reflect on how your role fits within a One Health approach to addressing AMR in your country.

Explore this course

Microbiology courses

The Fleming Fund

Quality assurance and AMR surveillance

In this course you will learn about the key principles underlying laboratory quality and the processes a laboratory puts in place to ensure it operates to a consistently high standard and generates good quality data. You will probably be familiar with many of the terms used in the context of quality, and many of them sound similar, for example, quality control, quality assurance and quality management system.

Learning outcomes include:

- Explain the importance of data integrity and quality in laboratory practice in the AMR surveillance context.
- Outline quality assurance measures in the context of AMR surveillance.
- Describe the key components of laboratory practice that underpin the quality testing and analysis of antibiotic resistance data.
- Recognise that your role is an integral part of the AMR surveillance process and that you are responsible for managing quality standards in the workplace.
- Reflect on the different components of a quality management system and how these are applied in your workplace, and what improvements could be made to ensure that your workplace is obtaining, recording and reporting good quality data.

Explore this course

Isolating and identifying bacteria – human health

This course covers microbiology techniques for isolating and identifying bacteria in clinical laboratories, including the key principles around sample collection and transport, and storage of isolates.

Learning outcomes include:

- Know where samples are obtained from and reflect on the process by which bacterial samples are processed in your workplace.
- Be able to describe the principles of laboratory tests used to isolate and identify key bacterial pathogens in human health, which are the focus of the GLASS programme.
- Know when and why advanced testing such as mass spectrometry and automated systems are used.
- Know the importance of procedures designed to ensure the quality of laboratory work relating to isolating and identifying bacteria in your workplace.

Explore this course

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Antimicrobial Susceptibility Testing

This course covers disk diffusion tests and gives an overview of Minimum Inhibitory Concentration (MIC) and breakpoints. It introduces data reporting and the importance of quality assurance in this process. Example pathogen-microbe combinations are relevant to human and animal health.

Learning outcomes include:

- Describe the principles of Antimicrobial Susceptibility Testing (AST).
- Understand the concepts of phenotypic methods for AST.
- Understand the process of disk diffusion testing and the relevant quality measures needed.
- Understand the principles of other phenotypic methods, including automated methods.
- Understand that the method used may depend on the organism being tested.
- Understand the concept of MICs and breakpoints.
- Recognise relevant international guidelines, and know where to find them and when to use them.
- Recognise that additional testing may be needed to identify/confirm resistance mechanisms.
- Recognise the importance of procedures designed to ensure the quality of AST testing in your workplace.

Explore this course

Testing mechanisms of resistance

This course covers phenotypic and genotypic laboratory techniques that are used to test for common mechanisms of resistance. It emphasises the importance of good quality data and practices.

Learning outcomes include:

- Give examples of the resistance patterns/resistant organisms causing global concern.
- Give examples of the resistance patterns/resistant organisms encountered in your work.
- Understand the difference between screening and confirmatory testing.
- Describe some of the phenotypic methods commonly used for screening and confirmation of resistance mechanism.
- Understand how genotypic methods can be used, and the advantages/disadvantages of genotypic versus phenotypic methods.
- Understand how more data from detailed testing for resistance mechanisms/genes contributes to AMR surveillance.
- Apply your knowledge of these laboratory tests to interpret data relevant to your work.
- Know the importance of procedures designed to ensure the quality of these laboratory tests in your workplace.

Explore this course

Surveillance courses

The Fleming Fund

Introducing AMR surveillance systems

This course introduces you to AMR surveillance systems and the One Health Approach to AMR surveillance. It provides an overview of the relationships between AMR surveillance systems in humans, animals and the environment. It also introduces local, national and global AMR surveillance networks and covers the functions of these networks, the types of data that are collected and the uses of this data. Finally, it takes you through surveillance system design using examples.

Learning outcomes include:

- Describe the objectives and requirements of AMR surveillance systems.
- Describe the One Health approach to AMR surveillance.
- Outline the differences between antimicrobial resistance, antimicrobial use and antimicrobial consumption surveillance.
- Describe the types of data collected by surveillance networks.
- Provide examples of AMR surveillance systems in humans and animals.
- Outline the importance of and relationships between local, national and global AMR surveillance networks and systems.
- Explain integrated surveillance systems, providing examples.
- Identify local and national surveillance networks or systems relevant to your work context.
- Describe how surveillance systems can be designed.

Explore this course

An introduction to AMR surveillance

The aim of this course is to introduce the principles of surveillance, with particular emphasis on AMR surveillance.

Learning outcomes include:

- Understand the purpose of surveillance.
- Describe key surveillance terms and concepts.
- Describe different types of surveillance.
- Understand different methods of undertaking surveillance.
- Understand the purpose of AMR surveillance.
- Describe different types of AMR surveillance.
- Understand the importance of comparing surveillance across sectors (human, animal, agricultural and environmental).

Explore this course

The Fleming Fund

An overview of national AMR surveillance

The aim of this course is to explore and understand national AMR surveillance systems. It builds on the concepts and learnings from the course Introducing AMR surveillance systems.

Learning outcomes include:

- Describe the structure, functions and characteristics of AMR surveillance systems in the context of the WHO GLASS approach.
- Know the components of national surveillance systems and how they contribute to AMR surveillance.
- Understand the governance structures needed for a functioning surveillance system, such as Antimicrobial Resistance Coordinating Committees, technical working groups and equivalent bodies.
- Understand the key stakeholders needed to establish, support and maintain such a system.
- Know how your role fits within local and national AMR surveillance systems.

Explore this course

Data courses

The Fleming Fund

Fundamentals of data for AMR

This course introduces the basic concepts, definitions and sources of data related to antimicrobial resistance. It reviews why data on AMR, AMU and AMC needs to be collected, analysed and reported. You will be introduced to important concepts related to error and bias, and how they affect the interpretation and use of AMR, AMU and AMC data.

Learning outcomes include:

- Explain why it is important to measure AMR, AMU and AMC data.
- Identify different types of AMR, AMU and AMC data.
- Explain how data becomes useful and leads to informed decision making in the AMR response.
- Identify and explain potential sources of error and bias that affect the quality and reliability of AMR, AMU and AMC data.

Explore this course

Legal and ethical considerations in AMR data

This course introduces key concepts in medical, public health and animal ethics and shows how they relate to AMR. It then introduces the role of international legal frameworks and governance mechanisms that are relevant to AMR, highlighting that this is an emerging area of research and practice.

Learning outcomes include:

- Define the four principles of medical ethics.
- Identify key ethical issues relevant to AMR.
- Describe guidelines for ethics in healthcare, health research and public health and how they are relevant to AMR.
- Describe guidelines and key concepts in animal ethics relevant to AMR.
- Describe the current and potential role of international legal frameworks in supporting action on AMR.

Explore this course

The Fleming Fund

Processing and analysing AMR data

This course looks at how AMR data is transformed into information, locally and nationally. It provides an overview of the stages from data collection, to data management and data analysis. It introduces the core concepts, approaches and methods for analysing data, including descriptive and inferential statistics, and how they lend themselves to answering important questions about AMR. Sources of error and bias are also reviewed.

Learning outcomes include:

- Describe components of the information cycle.
- List and explain principles of best practice for data collection.
- List and explain principles of best practice for data management.
- Explain the difference between descriptive and inferential statistics.
- Calculate measures of central tendency.
- Understand concepts related to hypothesis testing.
- Interpret reported findings from a hypothesis test, including strength of statistical evidence, and potential sources of error and bias.

Explore this course

Summarising and presenting AMR data

This course introduces common ways to summarise data visually, reviews the strengths and limitations of each approach and discusses the use of visual summaries to enhance the analysis of AMR-related data. The course explores the effectiveness of visual summaries in communicating important information to a wide range of people. Learners will have the opportunity to reflect on the most appropriate ways to visualise AMR-related data to look for patterns and trends and identify errors in data.

Learning outcomes include:

- Describe the different ways to represent data visually.
- Explain why visual summaries of data are an essential part of AMR data analysis.
- Review the strengths and limitations of each visual presentation.
- Make a simple graph and map using AMR data.

Explore this course

Data communications courses

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Communicating AMR data to stakeholders

This course focuses on effectively communicating AMR data to a variety of stakeholders.

Learning outcomes include:

- Appreciate the 'bigger picture' and make the most of AMR, AMU and AMC data.
- Identify local, national and global 'AMR networks' and stakeholders.
- Recognise different target audiences, and effectively match your communication strategies to each audience.
- Use a range of communication styles and platforms.

Explore this course

Using AMR data for policymaking

This course explores how AMR data can be used to develop effective policies and how to communicate science data to policymakers who may not be subject experts.

Learning outcomes include:

- Understand how AMR data can influence policymaking.
- Identify the relevant policymakers and their roles.
- Use an engaging and accessible writing style for people who have major time constraints and who are not subject matter experts.
- Effectively deliver science advice to policymakers.
- Recognise barriers to policymaking and how to overcome them.

Explore this course

Stewardship courses

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Antimicrobial stewardship in clinical practice

This course focuses on the principles and practice of antimicrobial stewardship in the clinical context. It discusses prescribing practices and the use of antimicrobials for therapeutic purposes and the ways in which practices can be improved to mitigate the problem of AMR.

Learning outcomes include:

- Understand the principles of an Antimicrobial Stewardship (AMS) programme.
- Understand how to approach setting up an AMS committee.
- Indicate the place of the laboratory in the AMS process.
- Develop local prescribing guidelines.
- Describe AMS strategies such as prospective audit and feedback.
- Understand quantitative and qualitative ways to assess antimicrobial consumption and use.
- Appreciate the importance of understanding the pharmacokinetics and pharmacodynamics of antimicrobials in determining the optimum treatment strategy.
- Appreciate that AMS can be introduced gradually, and that initial emphasis on easier-to-achieve targets can lead to significant improvements.
- Refer to treatment guidelines and resources (such as WHO modules).
- Describe the costs and benefits (cost-effectiveness) of implementing AMS.

Explore this course

Diagnostic stewardship in clinical practice

This course explains the basic laboratory methods at a level that can be understood by non-laboratory personnel. The course introduces preanalytical, analytical and post-analytical laboratory processes, and discusses factors that contribute to the optimum performance of tests using the most cost-effective approach.

Learning outcomes include:

- Describe the roles in a diagnostic stewardship programme.
- Understand the principles of taking appropriate clinical samples.
- Appreciate the range of laboratory techniques available for bacterial isolation, pathogen identification and AST.
- Understand how microbiology can be appropriately reported to clinicians.
- Understand factors affecting bacteriology laboratory turnaround times and reporting.
- Promote good working relationships between laboratories and clinicians for effective diagnostic stewardship.
- Understand diagnostic stewardship in surveillance at national and international levels.
- Understand how to introduce a diagnostic stewardship programme.

Explore this course

Sampling courses

The Fleming Fund

Sampling – human health

In this course you will look at sampling for AMR surveillance in human health, but will also draw comparisons to animal health, where relevant, to emphasise the importance of One Health approaches in tackling AMR.

Learning outcomes include:

- Describe the purpose of sampling individuals for AMR surveillance.
- Explain what factors need to be considered when choosing which individuals to sample for AMR surveillance.
- Recognise the lists of priority pathogens suggested for sampling in individuals.
- List the steps involved in sampling individuals for AMR surveillance.
- Explain the common problems associated with identifying sampling frames and how they can be addressed.

Explore this course

Sampling – animal health

In this course you will look at sampling for AMR surveillance in in livestock and aquatic animal health, drawing comparisons to human health where relevant, as part of the emphasis on the importance of One Health approaches in tackling AMR.

Learning outcomes include:

- Describe the purpose of sampling livestock and aquatic species for AMR.
- Explain what factors need to be considered when choosing which livestock and aquatic species to sample for AMR surveillance.
- Recognise the lists of priority pathogens suggested for sampling in livestock and aquatic species.
- List the steps involved in sampling livestock and aquatic species for AMR.
- Explain the common problems associated with identifying sampling frames and how they can be addressed.

Explore this course

Animal health courses

The Fleming Fund

Isolating and identifying bacteria – animal health

This course examines the requirements for isolating and identifying pathogens important in animal health. It concentrates on general principles and practices but gives a more detailed account of some key veterinary pathogens. It also describes the importance of correct sampling, good laboratory practice and quality control measures.

Learning outcomes include:

- Rationalise specimen collection protocols with the aim of improving the effectiveness of the bacteriology diagnostic laboratory.
- Evaluate how different types of specimens, and their quality and condition, may impact the performance of microbiological tests.
- Describe the principles of laboratory tests used to isolate and identify the bacterial pathogens on which this course focuses.
- Critically analyse microbiological methods used by front-line veterinary diagnostic laboratories.
- Know when, why and how advanced testing (e.g. by mass spectrometry, automated systems and DNA-based tests) are used.
- Reflect on the importance of procedures designed to ensure the quality of laboratory work relating to isolating and identifying bacteria.

Explore this course

Antimicrobial stewardship in animal health

This course provides an overview of antimicrobial stewardship in animal health, including prescribing and using antimicrobials for therapeutic and nontherapeutic purposes and the role of diagnostics in guiding therapeutic decisions in food animal production.

Learning outcomes include:

- Define the five principles of an Antimicrobial Stewardship (AMS) in animal health.
- Describe how intrinsic and extrinsic factors drive prescribing behaviour.
- List and explain the different therapeutic and non-therapeutic uses of antimicrobial agents in food animal production.
- Identify the relationship between AMS and animal welfare.
- List antimicrobial agents rated as critically important for people that are commonly used in food animal production.

Explore this course

The Fleming Fund

Antimicrobial resistance in animals

The course introduces the uses of antimicrobials in animals to protect animal health and welfare, contribute to food safety and protect public health.

Learning outcomes include:

- Describe the ways in which antimicrobials are used in animals.
- Describe the main mechanisms by which AMR in animal production systems may influence the occurrence of resistance in human pathogens, and other routes influencing the occurrence of resistance in animals and the environment.
- Explain the consequences of resistant bacteria in animals for animal health, food production and human health.
- Explain why monitoring AMR in food animal systems (including samples from healthy animals) is critical for tackling the AMR crisis.
- Illustrate the links between animal health, human health and the environment in animal production systems in relation to AMR.
- Apply scientific terminology related to AMR in animals when explaining your current work.

Explore this course

AMR surveillance in animals

This course describes the approaches to surveillance that take place in an animal health context. It explains the concepts of AMR, AMU and AMC and what data are obtained in each category. It also discusses antimicrobial residues and the importance of maintaining surveillance of these products.

Learning outcomes include:

- Explain the importance of AMR, AMU, AMC and residues data and their importance when tackling the AMR challenge.
- Describe and identify the main types of surveillance systems.
- Explain how local surveillance data is obtained from animals, and the importance of this data in national surveillance networks.
- Reflect on how your role fits within local and national AMR surveillance networks, and explain the roles of the different stakeholders within the surveillance networks.
- Explain the purpose of AMR-related surveillance and monitoring in animals, and the importance of conducting surveillance in different groups of animals.
- List some of the key points to consider when designing a sampling strategy for AMR surveillance in animals.

Explore this course

New courses in 2025

The Fleming Fund

Gender and equity in AMR surveillance

This course examines how AMR is shaped by both biological and social determinants of health; and what this means for global health policy and practice.

Explore this course

AMR in the environment

This course builds on The problem of AMR, Introducing AMR and Introducing a One Health approach to AMR exploring in depth the environmental dimensions of AMR and the role of environmental surveillance as part of a One Health multisectoral approach to addressing AMR.

Explore this course

Whole genome sequencing in AMR surveillance

This course offers an introduction to whole genome sequencing (WGS) and its application in Antimicrobial Resistance (AMR) surveillance. It covers the fundamental principles of WGS and highlights the growing importance of WGS data in providing important policy-relevant insights for AMR surveillance.

Explore this course

The health and economic burden of AMR

This course provides an overview of the burden of disease associated with AMR and an introduction to the economics of AMR from a One Health perspective. It defines burden as an epidemiological term, introduces key epidemiological concepts essential to understanding AMR and its burden, covers methodologies for measuring AMR burden and considers their strengths and limitations. Additionally, it outlines the economic consequences of AMR on healthcare systems, communities, and economies, and explains how cost-effectiveness analysis can guide policy decisions to mitigate AMR.

Explore this course