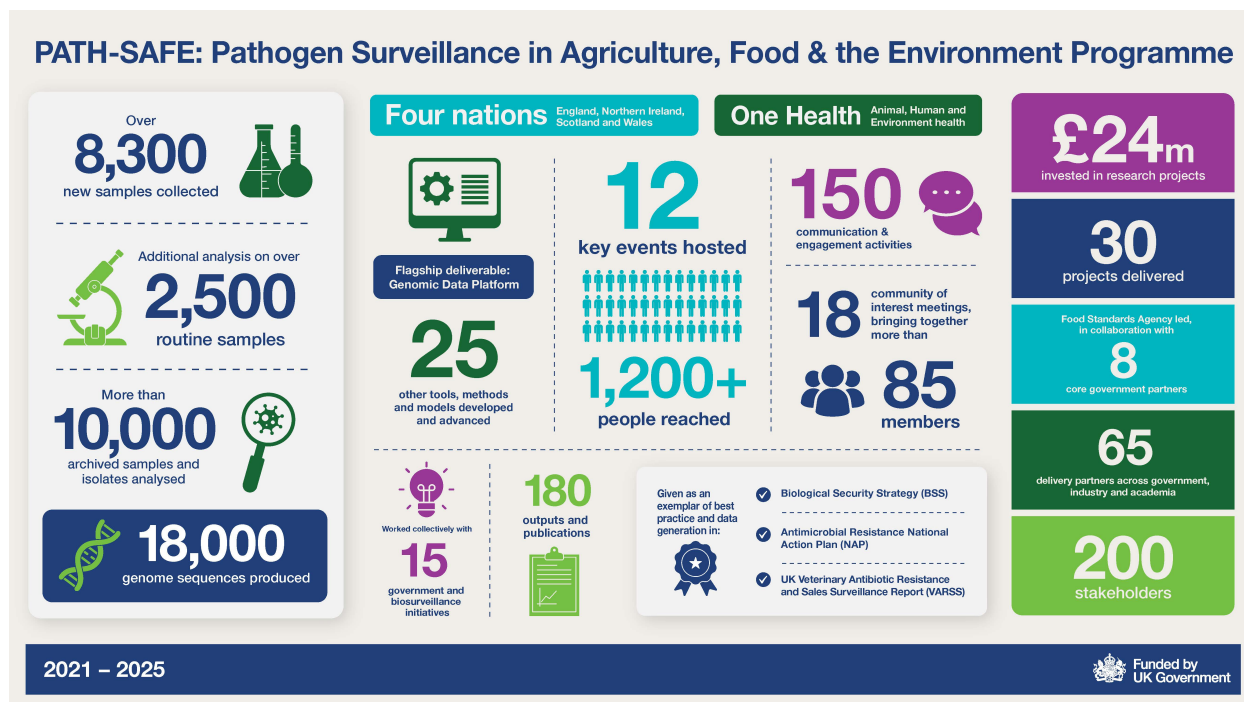# Pathogen Surveillance in Agriculture, Food and Environment (PATH-SAFE) Programme

The PATH-SAFE programme piloted the development of a national surveillance network, using the latest DNA-sequencing technology and environmental sampling, to improve the detection and tracking of foodborne human pathogens and associated AMR through the whole agri-food system from farm-to-fork.

PATH-SAFE was a 4-year, cross government and UK wide programme, led by the Food Standards Agency (FSA) that utilised £24m of funding from the HMT Shared Outcomes Fund (SOF) and match funding from a range of government and academic delivery partners. The programme piloted the development of a national surveillance network, using the latest DNA-sequencing technology and environmental sampling, to improve the detection and tracking of foodborne human pathogens and associated AMR through the whole agri-food system from farm-to-fork.

PATH-SAFE ended in March 2025, however this page will continue to be updated with links to programme outputs, and will transition to include information about follow on biosurveillance work in due course.

In October 2024, a commentary summarising the program's achievements, and consideration on how they could be taken forward beyond the lifetime of the program, was published in Future Microbiology (October 2024): Coordinated surveillance of foodborne pathogens and antimicrobial resistance: insights from the PATH-SAFE pilot.

PATH-SAFE: Pathogen Surveillance in Agriculture, Food & the Environment Programme

Over
8,300
new samples collected

Additional analysis on over
2,500
routine samples

More than
10,000
archived samples and isolates analysed

18,000
genome sequences produced

Four nations England, Northern Ireland, Scotland and Wales

Flagship deliverable: Genomic Data Platform

25
other tools, methods and models developed and advanced

12
key events hosted

1,200+
people reached

Worked collectively with
15
government and biosurveillance initiatives

180
outputs and publications

Given as an exemplar of best practice and data generation in:
- ✓ Biological Security Strategy (BSS)
- ✓ Antimicrobial Resistance National Action Plan (NAP)
- ✓ UK Veterinary Antibiotic Resistance and Sales Surveillance Report (VARSS)

One Health Animal, Human and Environment health

150
communication & engagement activities

18 community of interest meetings, bringing together more than

85
members

£24m
invested in research projects

30
projects delivered

Food Standards Agency led, in collaboration with
8
core government partners

65
delivery partners across government, industry and academia

200
stakeholders

2021 – 2025

Funded by UK Government

Programme background

Foodborne disease (FBD) is a major public health risk with 2.4 million individual illnesses and more than 16,000 hospitalisations per year. Most human disease is caused by a handful of bacteria which enter the food chain from farmed animals or the environment.

In addition to FBD, the agri-food supply chain also poses a risk for the transmission of antimicrobial resistance (AMR) through food, animals, humans, and water. Whilst the UK has made progress in reducing its use of antibiotics in humans and animals in the last five years, [drug-resistant bloodstream infections in humans have increased by 32% from 2015 to 2019](). The rise and spread of AMR is creating a new generation of 'superbugs' that cannot be treated with existing medicines.

For these reasons, government departments already undertake surveillance activities by analysing samples from food, livestock, and humans. Advances in technology and data management offer the opportunity to create a step change in surveillance, to protect public health. The PATH-SAFE programme established a new data platform that allows for the analysis, storage and sharing of pathogen sequence and source data, collected from multiple locations across the UK by government departments and public organisations. This single system will enable rapid identification and tracking of FBD and AMR. This will improve public health and minimise the economic and environmental impact of outbreaks.

Aims of the programme

1. To pilot a better national surveillance system for the monitoring and tracking of FBD and AMR in the environment and agri-food system
2. To bring together and build on existing initiatives across the UK and to understand what the end-user needs to improve how they work in this space
3. To provide better data to identify the prevalence, source and pathways of FBD and AMR, helping to prevent spread by enhanced targeting of interventions

Benefits of the programme

1. Generation of information and knowledge that support enhanced identification of FBD?and ?AMR sources
2. Providing improved user access to relevant data so they can make more informed, evidence-based decisions
3. Data that underpins the prevention and prediction of FBD?and?AMR?spread by supporting improved, cost-effective targeting of interventions, providing economic savings both for government and industry
4. Improved surveillance system that supports better identify and quicker reaction to emergent diseases (or diseases of increasing concern).
5. Potential to reduce the number and cost of?FBDs and?AMR, lower commercial losses, strengthen UK Science Excellence, and enhance the UK food sector's reputation

Programme partners

The PATH-SAFE programme was led by the FSA, supported by several core partners:

- Food Standards Scotland (FSS)
- Department of Environment, Food and Rural Affairs (Defra)
- Animal and Plant Health Agency (APHA)
- Centre for Environment, Fisheries and Aquaculture Science (Cefas)

- Environment Agency (EA)
- Veterinary Medicines Directorate (VMD)
- Department of Health and Social Care (DHSC)
- UK Health Security Agency (UKHSA)

The programme was delivered through a one-health, four-nation collaborative approach, both at the delivery level and at the strategic level.

More than 65 organisations, from across government, academia and industry, have been involved in delivery and advisory roles. These have included:

Funding source and timeline

PATH-SAFE was funded via the Treasury Shared Outcomes Fund (SOF).

Spending Round 2019 announced £200 million for the Shared Outcomes Fund to fund pilot projects to test innovative ways of working across the public sector. The first round of the?SOF ? funded a wide range of projects to be run in 2020-21 and 2022-23.

Spending Review 2020 announced a further £200 million was to be made available for a second round of the Shared Outcomes Fund between 2021-22 and 2023-24.

In 2021 the programme successfully secured £19.2m in phase 2 of the?SOF, to run a three-year programme concluding in March 2024.

At the start of 2024, PATH-SAFE successfully secured an additional £4.7m of funding to continue for an additional year (April 2024 to March 2025), with HMT?SOF ?providing £2.2m of the continuation funding, leveraged by £2.5m of match funding from PATH-SAFE core government partner departments and academic delivery partners.?

Programme themes

The programme was organised thematically for governance, oversight, reporting and coordination purposes.

Further information about each of the themes, including overviews, delivery partners, status, key successes and outputs can be found on the following pages:

- National foodborne disease genomic data platform
- Onsite Diagnostics
- Novel Foodborne Pathogen, and associated antimicrobial resistance, knowledge and surveillance approaches
- Programme Evaluation

The programme developed new systems and tools, explored novel surveillance approaches and generated knowledge, to improve the detection and tracking of foodborne human pathogens and antimicrobial resistance, through the whole agri-food system from farm-to-fork.

Alongside the technical advances the programme has driven forward, PATH-SAFE has also established and promoted a collaborative, four nation, One Health approach to surveillance, which has been referenced as an exemplar within initiatives such as the Biological Surveillance Strategy and the UK AMR National Action plan (noted within as a key achievement).

The programme has influenced, informed, and supported programmes, strategies and initiatives across government and beyond, including:

- Biothreats Radar and National Biosurveillance Network (NBN)
- UK Microbial Forensics Consortium (UKMFC)
- Genomics of Animal and Plant Disease Centre Phase 2 (GAP-DC2)
- AMR National Action plan (NAP) 2019-24 and 2024-29
- UKRI Tackling Infections Strategic Theme
- Government Office for Technology Transfer (GOTT)
- Microbiology Society – Knocking Out AMR initiative
- ONS Integrated Data Service (IDS) Programme
- Food Safety Research Network (FSRN)

Events and communications

Throughout the programme, a range of events and communication activities have been undertaken including a webinar series, a conference and publication of quarterly newsletters.

Further information on these events and activities can be found on the following pages:

- Webinar series and newsletters
- PATH-SAFE biosurveillance conference (February 2024)

Get in touch

If you would like to get in touch with the PATH-safe team, you can email them at pathsafe@food.gov.uk