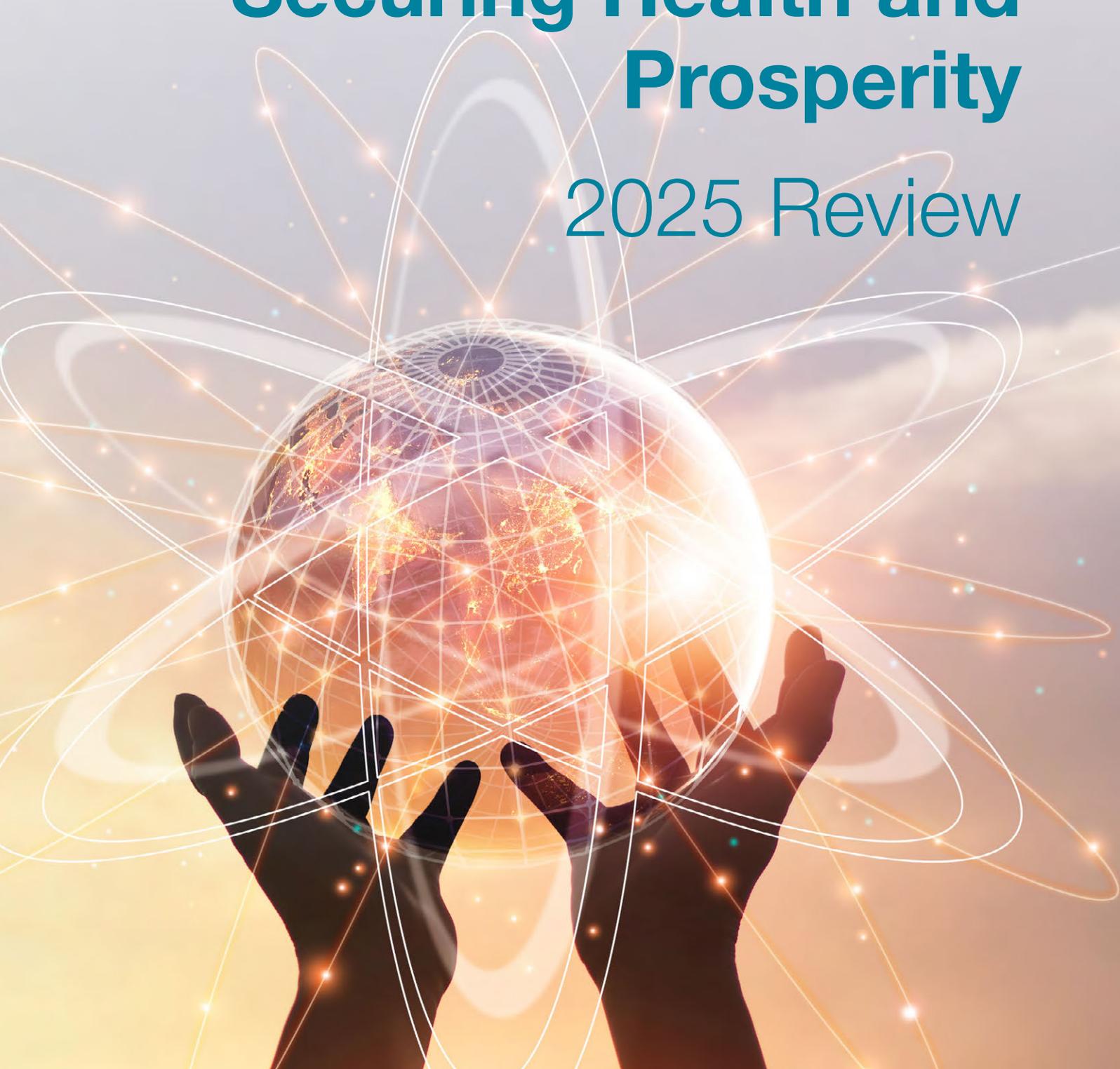




UK Health
Security
Agency

UKHSA Science: Securing Health and Prosperity 2025 Review



About UKHSA

The UK Health Security Agency prepares for and responds to infectious diseases, and environmental hazards, to keep all our communities safe, save lives and protect livelihoods.

We provide scientific and operational leadership working with local, national and international partners to protect the public's health and build the nation's health security capability.

UKHSA is an executive agency, sponsored by the Department of Health and Social Care (DHSC).

For most of UKHSA's work, our remit covers England as health protection is largely a devolved policy area. We hold some UK-wide responsibilities on reserved matters where the UK government has retained policy responsibility.

UKHSA recognises the cross-border nature of health threats and health inequalities and works in close partnership with the devolved governments on common challenges.



Contents

Case studies	5
Foreword	6
UKHSA Science Strategy – our journey so far	8
Scientific ambition 1: Predict and anticipate health threats	10
Genomics	10
Vector-borne disease	13
Data and modelling	14
Scientific ambition 2: Create a more secure environment	16
Climate and health	16
Antimicrobial resistance	18
Bioinformatics	18
Public Health Microbiology	20
Scientific ambition 3: Reduce and eliminate health threats	22
Centre for Pandemic Preparedness	22
Chemical Radiation and Nuclear	25
UK Public Health Rapid Support Team	27
WHO Collaborating Centres	27
Scientific ambition 4: Act on the evidence	30
Science and research frameworks	31
Academic partnerships	32
Behavioural Science and Insights	33
Scientific ambition 5: Unlock the potential of our assets	38
Pioneering research: Growth Through Science	38
Securing the workforce of the future	44
Looking forward to secure better health and prosperity	46
Appendix A: Glossary	48
References	49

Case studies

The following case studies included in this review are examples of our work in 2025.

[Case study 1](#): Using genomics to inform HCV treatment strategy and elimination

[Case study 2](#): Turning warnings into action: UKHSA Weather-Health Alerting system

[Case study 3](#): Network analysis of hospitals to identify novel *C. difficile* strains

[Case study 4](#): Monitoring the microbiological safety of imported foods

[Case study 5](#): Training in normal times, pandemic preparedness and capacity strengthening

[Case study 6](#): Tachyon a field-deployable molecular diagnostics platform

[Case study 7](#): Oropouche virus

[Case study 8](#): Behavioural Science contribution to Exercise Pegasus

[Case study 9](#): Non-toxigenic *C. diphtheriae* in people experiencing homelessness

[Case study 10](#): Updated tuberculosis guidance in secure settings: evidence base

[Case study 11](#): A 'fridge-free' vaccine

[Case study 12](#): Supporting Pathways to Antimicrobial Clinical Efficacy (PACE)

Further case studies are available at the [UKHSA Research Portal](#).

Foreword



It is my pleasure to introduce this review of UKHSA's science, in which we reflect on our progress during 2025 and outline our future plans.

We have organised this review around the 5 scientific ambitions we set in our 2023 [Science Strategy](#) to:

- 1 Predict and anticipate health threats
- 2 Create a more secure environment
- 3 Reduce and eliminate health threats
- 4 Act on the evidence
- 5 Unlock the potential of our assets

We have selected interesting examples of our work to highlight progress under each ambition, but the ambitions are not mutually exclusive and much of our work will cut across a number of them.

We have tried to focus this review on significant activity in 2025, but our science covers a broad base of disciplines often being undertaken with other more significant partners, over multiple years and under peer review. As such not all of our scientific work will be covered here.

UKHSA created a decade-long strategy for our science in 2023 to cement some of the scientific capabilities that were so critical during the COVID-19 Pandemic response. Last year underlined the importance of this in a turbulent international context with changing health threats that are more frequent and more complex.

As we take stock of progress made, we also turn our eyes to the future. I joined UKHSA in September 2025 as part of a transition to a new executive model with a new Chief Executive and a newly established Chief Operating Officer role. The decision to transition our Porton and Colindale facilities to a new scientific campus

in Harlow had just been announced and a 3-year funding settlement meant that we were able, for the first time in some years, to start making longer term plans for our scientific development. At the same time, the publication of the [Life Sciences Sector Plan](#) has highlighted the critical role for UKHSA's scientific capabilities in helping to underpin the [Modern Industrial Strategy](#).

Through all this, our scientists have continued to deliver high-quality science across the broad range of disciplines and specialist functions you can read about in these pages. My thanks to them for their dedication, commitment and excellence.

I hope to see as many of you as possible at the [UKHSA conference in Manchester on 22-23 September](#) later this year. If there is something that interests you or you'd like to know more about what UKHSA's science involves and enables: please get in touch with us at sciencestrategy@ukhsa.gov.uk

A handwritten signature in black ink, appearing to read 'Robin May', with a long horizontal flourish extending to the right.

Professor Robin May
Interim Chief Scientific Officer
UK Health Security Agency
March 2026

UKHSA Science Strategy – our journey so far

2024

- Launch of UKHSA climate and health digital portal



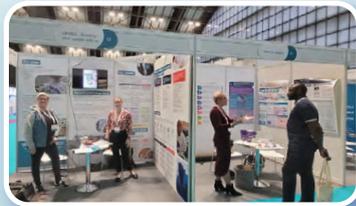
- UKHSA became a WHO Collaborating Centre for Research into Epidemics and Pandemics



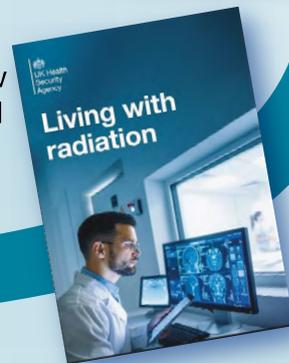
- New genomics services for *Clostridioides difficile* ribotyping network (CDRN) and Measles



- Career frameworks in Bioinformatics and Genomics, Toxicology and Epidemiology developed

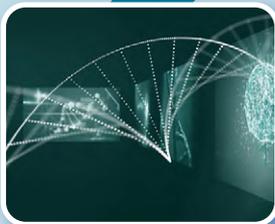


- Suite of new user-focussed Radiation guidance published



2025

- Genomic data-sharing for priority pathogen lists approved



- Global biosecurity agreement signed with Coalition for Epidemic Preparedness (CEPI)

- Exercise Pegasus - Tier 1 Pandemic Planning Exercise designed and delivered



- Delivery of Project Amplify to provide pandemic preparedness capability at Porton





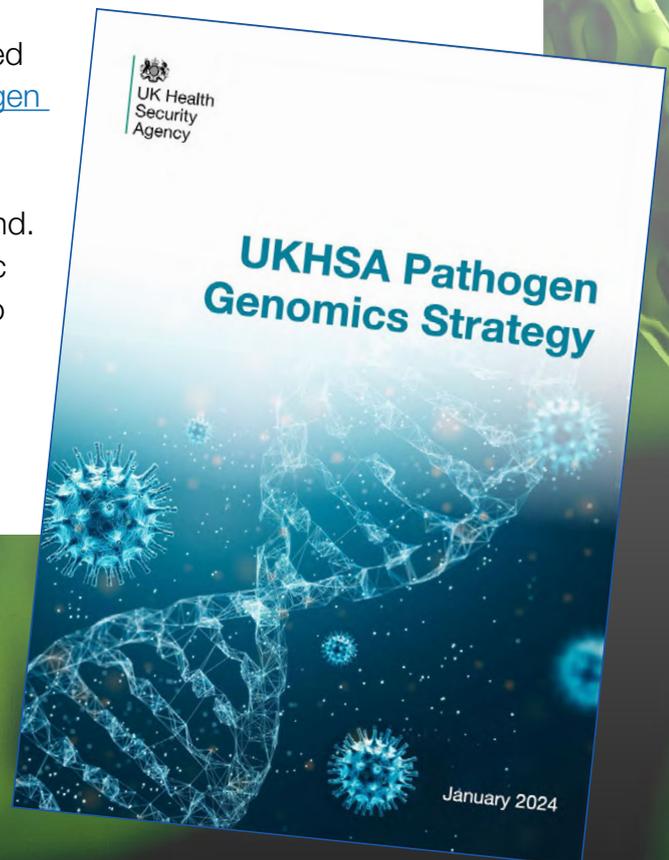
Scientific ambition 1:

Predict and anticipate health threats

In our 10-year Science Strategy we outlined how our scientific work will enable us to identify and understand new health threats rapidly. We highlighted the need to invest in genomics, data science and surveillance (including vector surveillance) in order to improve our ability to predict health threats. Over the last year, we have started to make investments in a number of these areas.

Genomics

UKHSA's first years have seen strategies developed in different scientific areas. We published a [Pathogen Genomics Strategy](#) in January 2024 setting out our 5-year ambition to deliver transformative improvements to public health genomics in England. Pathogen genomics involves analysing the genetic material of microorganisms that cause diseases to understand how best to reduce their harms, and 2025 has seen foundational progress across the Strategy's 7 strategic aims which cut across 3 priority public health areas.



Pathogen genomic strategic aims

1. Use genomic data to optimise clinical and public health decision-making, from local to global setting
2. Use genomic data to drive improvements in diagnostics, vaccines and therapeutics
3. Provide a nationally coordinated, high-throughput pathogen genomics sequencing and analysis service
4. Undertake a genomics workforce transformation within and beyond UKHSA
5. Commit to pathogen genomic data sharing and global collaboration
6. Drive innovation in pathogen genomics
7. Build high-impact services that are good value for money

Pathogen genomic areas of public health focus

1. Antimicrobial resistance (AMR)
2. Emerging infections and biosecurity
3. Vaccine-preventable diseases and elimination programmes

Evidence of this progress cuts across our scientific ambitions, whether through the pioneering [Metagenomics Surveillance Collaboration and Analysis Programme \(mSCAPE\)](#), the progress on bioinformatics and talent development or our capability development around vaccines.

Genomics underpins critical UKHSA objectives around reducing and eliminating the burden of diseases alongside investigating outbreaks and tracking possible changes in vaccine effectiveness.

Throughout 2025, further strides were made in developing and using genomics across a range of services and research areas. We modernised services, replacing older methods with whole genome sequencing to deliver improved disease characterisation and treatment insights directly benefitting patients and local populations.

One example is our work on hepatitis C virus (HCV) genomics, which supports the UK's aim to eradicate this infection while also supporting delivery of the [Health Equity for Health Security Strategy 2023 to 2026](#). This will identify and characterise HCV endemic subtypes in societal groupings in England that are known to have poor treatment outcomes and will inform treatment strategies.

 GOV.UK

UKHSA launches new metagenomic surveillance for health security

The UK launches mSCAPE, a world-first metagenomics initiative by UKHSA to enhance health security through rapid pathogen detection and surveillance.

From: [UK Health Security Agency](#)
Published 30 January 2025



news

The UK has taken a leap forward in its efforts to use pathogen...

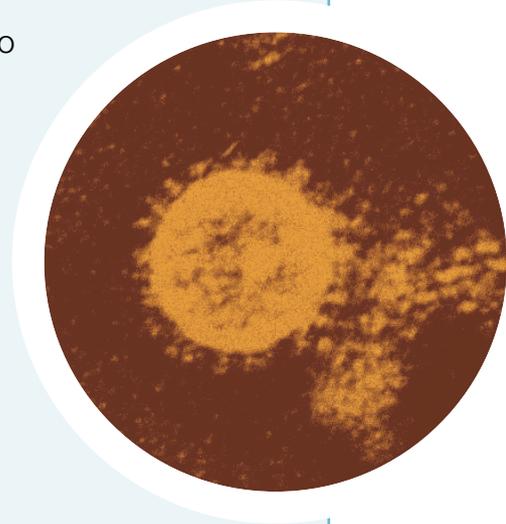
Case Study 1 [Click title for link](#)



[Using genomics to inform hepatitis C virus \(HCV\) treatment strategy and elimination](#)

In 2016, the World Health Organization (WHO) set a goal to eliminate HCV as a global health threat by 2030. HCV can cause severe liver damage including cancer but is curable using antiviral drugs. These have been used successfully by NHS England (NHSE) since 2015. However, early evidence shows that some drugs may not work as well in people who have certain HCV strains, predominantly found in low and middle-income countries (LMICs), such as subtypes 1l, 3b or 4r.

We analysed blood samples from people in England who have an HCV strain found mainly in LMICs. We confirmed that several types of antiviral drugs work less well in people with these strains, who were mostly migrants from LMICs. This information will improve NHSE HCV treatment strategies. By increasing the likelihood that migrants with HCV can access an effective treatment regimen, our science helps reduce health inequalities, improve health security and eliminate HCV as a public health threat. This research has also resulted in the establishment of a national HCV Genomics Surveillance Programme where genomic data will be linked regularly to epidemiological and clinical databases at UKHSA. This will support continued monitoring of treatment outcomes, the emergence of drug-resistant strains and transmission networks to inform public health interventions and prevent onward transmission.



We have developed a Whole Genome Sequencing (WGS) service for *Clostridioides difficile* (*C. difficile*) in response to rising infections. We have also undertaken method development and evaluation of long read sequencing to investigate resistance mechanisms and transmission dynamics of carbapenamase-producing Enterobacterales (CPE).

The mSCAPE platform is live and receiving data from NHS sites across the country. Pathogen agnostic surveillance will help identify new threats through more rapid identification of pathogens and will reduce harm by speeding up treatment and minimising transmission.

Genomics in research and development (R&D) is contributing to enhanced services and greater understanding across many disciplines. The application of genomics is accelerating diagnostic and vaccine development, and new therapeutic measures. Genomics is also contributing to non-infectious diseases, for example through the Tachyon molecular device in radiological dosimetry (see [case study 6](#)).

UKHSA has one of the largest collection of genomes and routinely uses genomics for identification and critical antimicrobial resistance prediction for gastrointestinal food-borne and zoonotic bacteria of public health importance. Rapid analysis using advanced automated genomic pipelines is extremely valuable for outbreak investigation, enhanced surveillance and often serves as an early warning system for detection of international food safety incidents.

The breadth of benefits in genomics and data science is evident in cross government programmes such as [PATH-SAFE](#). This multi-agency programme (funded by [HM Treasury's Shared Outcomes Fund](#)) involves UKHSA gastrointestinal bacterial genomic data being shared securely with partner agencies (Animal and Plant Health Agency and Food Standards Agency) to identify the source of outbreaks and analyse the AMR transmission pathways.

Vector-borne disease

Climate change is driving increases in vector-borne disease (VBD) and creating new threats to UK and global populations. UKHSA responds to incidents of VBD, underpinned by laboratory testing and detailed epidemiology which creates data we use to model potential outbreaks. For example, in 2024 UKHSA undertook modelling with regards to the Paris Olympics and Paralympics to identify risks around the slow march northwards of Dengue over recent years. In 2025 we implemented improved vector surveillance models and continued to deliver [UK Research and Innovation \(UKRI\)](#) funded projects in the UK Overseas Territories (UKOTs).

Specific initiatives include the application of metagenomics to enhance the library of over 300 viruses held in the [National Collection of Pathogenic Viruses](#), one of 4 culture collections curated by UKHSA. Research enabled by this facility has enhanced our understanding of West Nile virus through the use of new tools.

Implementation of the Mosquito Surveillance Insights Dashboard (MoSIDash) provides an interactive overview of mosquito surveillance data across the UK to UKHSA scientists and has allowed quicker access to information and initial analyses of data. Through this we can now



offer more targeted insights to local authorities using advanced models for new vectors, such as the *Ixodes ricinus* tick species. MoSIDash also allows us to assess the risk for onward transmission using bespoke models for disease dynamics, as we did with the first detection of West Nile Virus within the UK. UKHSA surveillance identified the *Hyalomma marginatum* tick in the UK, usually hosted on birds and considered to be the most important vector of Crimean-Congo haemorrhagic fever virus in Eurasia. Two cryptic malaria cases and a local exposure to tick-borne encephalitis were also investigated. We conducted enhanced surveillance at Heathrow airport related to 2 invasive mosquito incidents.

Data and modelling

UKHSA science continues to be underpinned by data and information. Maximising the impact of the data we hold and using data in new and exciting ways offers many opportunities to improve health and prosperity. Through our [Data Strategy](#) we have built on strong foundations to improve our systems and culture to create and share greater insights.

We have implemented a system of weekly forecasts based on the [UKHSA weekly winter surveillance bulletin](#) using a 'multi model ensemble', a technique where machine learning, statistics and forecasting combine multiple models to improve the accuracy of predictions made using available data. Analysis of winter 2023/24 hospital admissions in England revealed that increasing vaccine uptake and addressing pre-existing health conditions and deprivation could substantially reduce inequalities in both flu and COVID-19 hospitalisations as outlined in this report [Health inequalities in health protection report 2025](#).

In preparation for winter 2024/25, forecasts covering admissions and bed occupancy were made for COVID-19, influenza, respiratory syncytial virus (RSV) and norovirus. These forecasts improve our understanding of infectious disease pressures in real time and drive scientific advances in this space. UKHSA has led a range of methodological advances such as the use of 'generalised additive models' for short term forecasting and this first 'trajectory sample-based model ensemble' for winter pressures forecasting.

These complex modelling techniques have allowed ethnicity and deprivation data to be included into forecasts, driving improvements across the health system and informing future intervention strategies.

The next steps for 2026 and beyond are to continue to exploit data analysis, modelling using large language models and other scientific and technological advances.

Figure 23. Percentage of detected respiratory virus among samples with completed testing for each virus in England by week, GP sentinel swabbing scheme

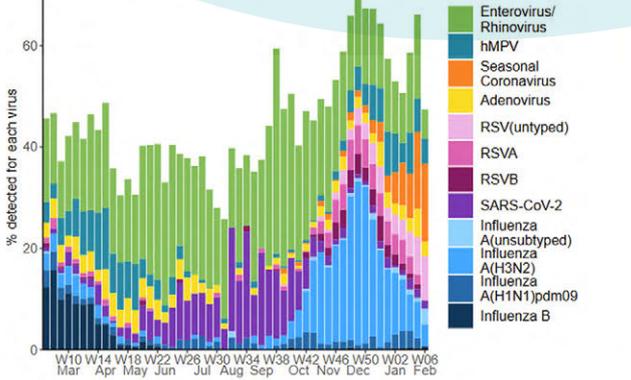
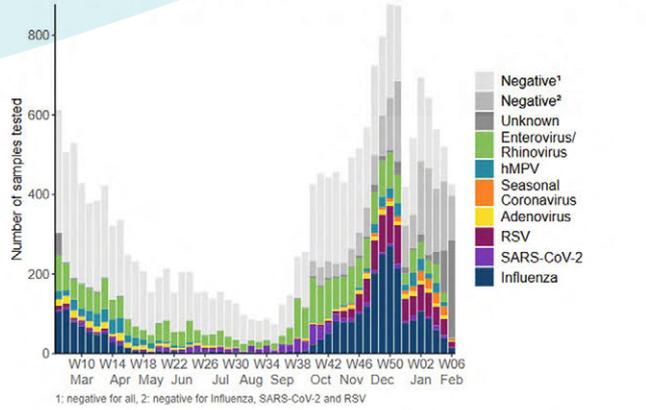


Figure 22. Number of samples tested for respiratory viruses in England by week, GP sentinel swabbing scheme [note 8]



Note 8: unknown category corresponds to samples with no result yet.

Figure 13. Number of ARI incidents by setting, England

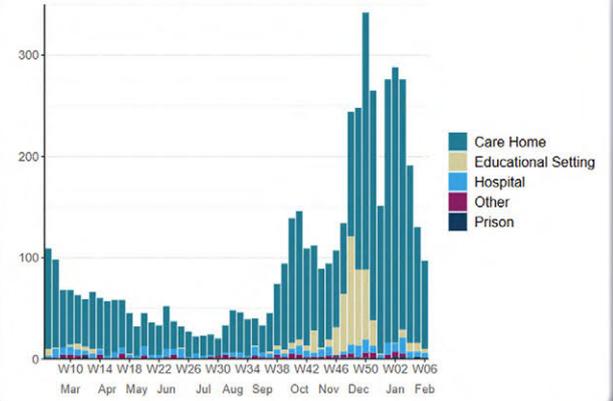


Figure 9. Respiratory DataMart weekly cases by influenza subtype, England

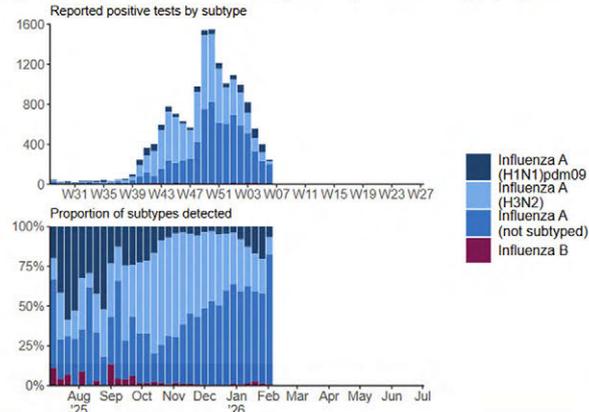
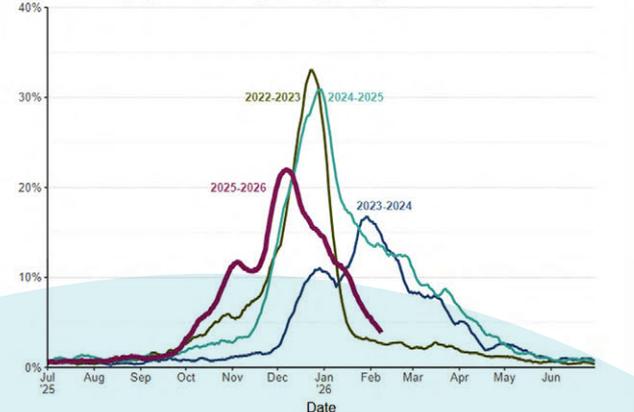


Figure 4. Rolling 7-day positivity of tests positive for influenza among all reported influenza tests, England 2022 to present [note 2]



Scientific ambition 2:

Create a more secure environment

UKHSA aims to create a more secure environment for all by enhancing our understanding of threats, exemplified by our Centre for Climate and Health Security (CCHS), work across the AMR National Action Plan and a strong bioinformatics foundation.

Climate and health

CCHS was established to understand and anticipate the impacts of climate and environmental change on health security and to develop evidence on the effective interventions through mitigation and adaptation.

CCHS has evolved the 2023 [Health Effects of Climate Change](#) (HECC) report into a series of Climate and Health Special Assessment reports. These provide timely synthesis of evidence to inform action by UKHSA's partners and began with the launch of a [report](#) concerning climate change and mental health in November 2025.

The number of heat-related deaths per year in England is predicted to triple by 2050. CCHS have played an active role in incident response through the provision of heat health alerts and associated risk assessments. Throughout summer 2025 UKHSA and the Met Office issued 13 heat health alerts published across UKHSA regions to inform the public and wider health system of potential health impacts. Guidance to inform and support the public has been published on GOV.UK [Beat the heat: staying safe in hot weather](#).

Case Study 2 [Click title for link](#)

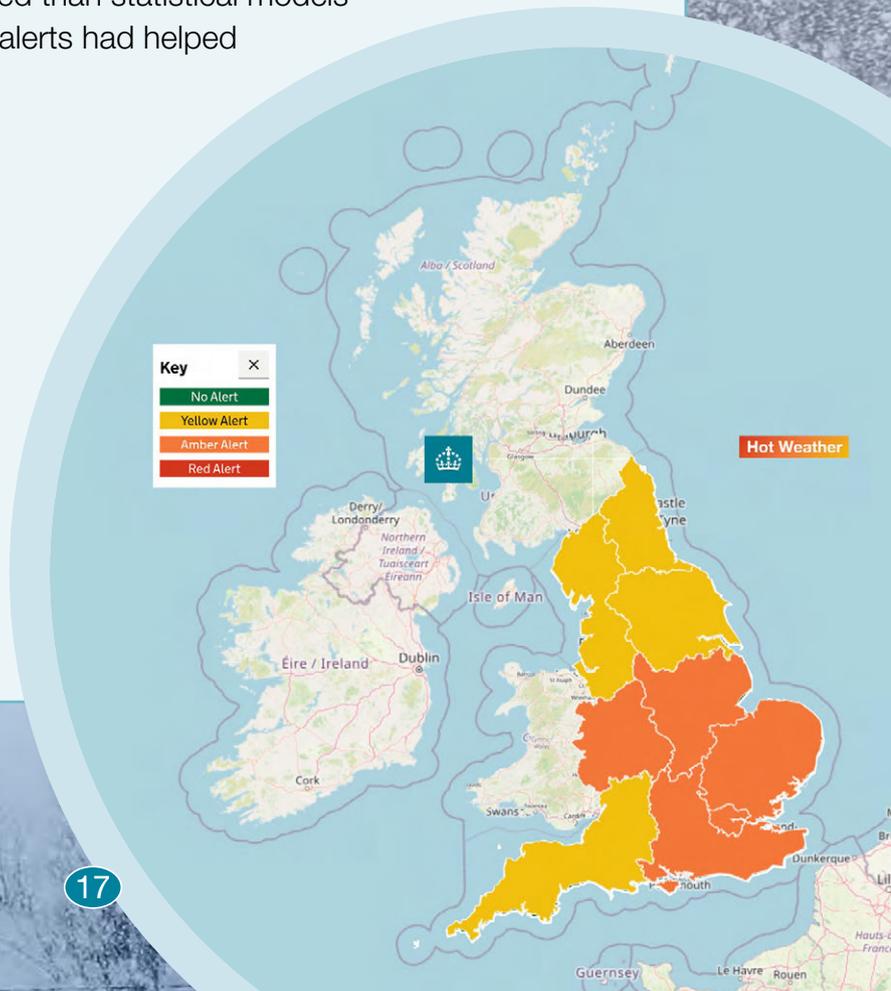


Turning warnings into action: UKHSA Weather-Health Alerting system

The Weather-Health Alerting system, developed by UKHSA in partnership with the Met Office is an early warning tool to protect public health from adverse hot and cold weather. Colour-coded alerts (yellow, amber, and red) are issued, based on the likelihood and severity of health impacts, with tailored guidance for specific audiences, such as health and social care providers. It delivers timely, impact-based alerts to over 40,000 stakeholders, enhancing readiness for hot and cold weather events.

Coordinated action during alerts significantly reduces health impacts: after the record-breaking 40°C heat in 2022 in England, almost 1,000 fewer heat-related deaths were recorded than statistical models predicted, suggesting that early alerts had helped save lives.

Work is ongoing to increase the geographic resolution of alerts which are currently at regional level in England. This could enable more locally tailored risk communications and interventions. Additionally, we are exploring enhanced use of epidemiological models and predictive analytics to inform the real-time decision-making process when issuing an alert.



Antimicrobial resistance

UKHSA leads on the development and delivery of the [UK Government's 5-year National Action Plan for antimicrobial resistance](#) which provides a practical, evidence-based approach to interrupt the transmission of pathogens to prevent harm from avoidable infections.

As a key collaborator in the [IMPACT AMR transdisciplinary network](#) of researchers and stakeholders, we are seeking to address key policy questions around AMR mitigation investment priorities through the development of an evaluation.

The 2025 [English surveillance programme for antimicrobial utilisation and resistance \(ESPAUR\) report](#), which highlights key AMR and healthcare associated infections research projects within UKHSA and with external stakeholders. This details ongoing work to develop a modelling approach to estimate the number of deaths due to antibiotic-resistant bacteraemia. This work enables a more accurate understanding of AMR's impact and helps identify where interventions may be most effective.

Bioinformatics

2025 saw the advancement of our bioinformatics capability; including piloting the implementation of long read sequencing and analysis of pathogen genomes to better track AMR-linked mobile genetic elements. Embedding genomics capability into existing surveillance workstreams continued, for example, in reference laboratory identification of genetic determinants of resistance in isolates. This will provide more detailed and accurate characterisation of hospital outbreaks, using reproducible analytical pipelines for surveillance functions across gastrointestinal pathogens (such as norovirus) thus allowing more efficient resource allocation for infection prevention and control within the NHS.

April 2025 saw the introduction of active surveillance of *C. difficile* strains circulating in England using whole genome sequencing analysis. This active surveillance uses isolates from 20 sentinel NHS trusts in England. The sentinel sites were identified by epidemiological modelling of patient transfer networks, which calculated that sampling from these sites will identify circulating strains of *C. difficile* 27% faster than if using 20 randomly chosen sentinel sites. This will align with surveillance strategies across the UK and will allow greater vigilance in the tracking and monitoring of *C. difficile* nationally and internationally.



Case Study 3



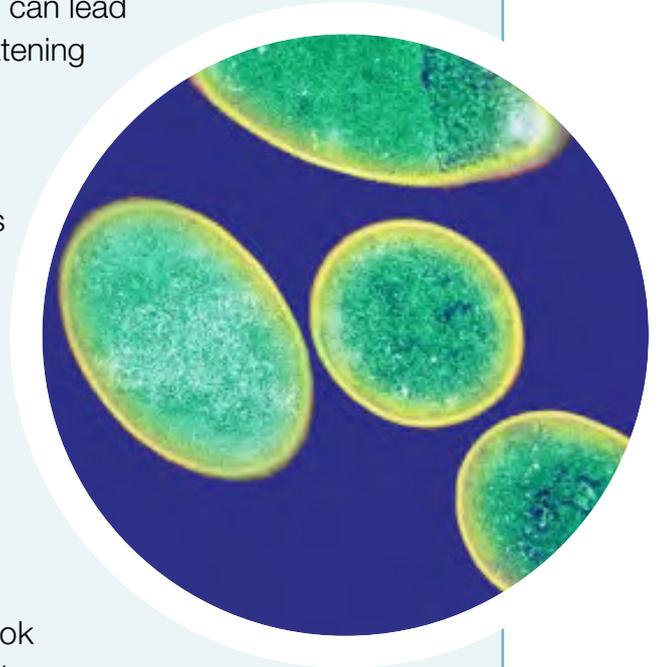
Network analysis of hospitals to identify novel *C. difficile* strains

C. difficile is a diarrhoea-causing bacteria that can lead to hospitalisation and in some cases life-threatening sepsis. It is important to detect novel strains quickly so that treatments and control can be adapted. Strains can be identified using gene sequencing, but laboratory capacity to do this is limited.

This research informed the design of a new *C. difficile* surveillance programme for English hospitals, in which a small number of hospitals acted as ‘sentinels’: these sentinel hospitals send specimens, from patients with *C. difficile* infection, to the sequencing laboratory who check them for genetic evidence of new strains. We undertook a network analysis of patient connections between hospitals (using existing routinely collected data) which was used in computer simulations of inter-hospital spread of a theoretical new strain. From these, we identified which combination of sentinels would deliver the quickest detection of a novel strain - no matter where it first appears - and make best use of limited laboratory facilities.

The network analysis was also used opportunistically to support response to a hospital-based outbreak of a particularly concerning strain of *C. difficile*, enabling public health officials to alert other hospitals which have strong connections to the outbreak locations, so proactive protective measures could be put in place in case of spread.

The original insight, which inspired the network analysis surveillance design, is applicable to many other pathogens which spread primarily between contacts within hospitals. We have already applied the incident-response alerts to an outbreak of another pathogen, *Candidozyma auris*, and it is proposed to similarly establish more sentinel-based WGS surveillances, as capacity permits.



Public Health Microbiology

2025 has seen us undertake a review of our Public Health Microbiology services. Having completed the initial baseline assessment, work in 2026 will assess options for improving the service and develop operating models to support the capabilities needed for the future.

Case Study 4 [Click title for link](#)



[Monitoring the microbiological safety of imported foods](#)

The Food, Water and Environmental Microbiology Services laboratories at Porton, London and York work with Port Health Authorities across England to test imported foods at the point of entry into the UK, to ensure they are microbiologically safe to enter the food chain. Where pathogenic bacteria are detected, whole genome sequencing of isolated strains identifies any links with cases of human illness. Collaborative actions involving UKHSA teams and laboratories, the Food Standards Agency and Port Health Authorities ensure that unsafe products are removed from the market.

By identifying unsafe consignments of food at the point of import, authorities can ensure that these are destroyed (or safely re-purposed) before they enter the UK food chain, effectively removing the potential for them to cause harm to consumers.

The recent example of imported chicken tested in 2025 that was contaminated with *Salmonella* has highlighted the significant number of human cases of illness potentially associated with this source of contamination. The identification of this source and introduction of appropriate controls will protect the public from further cases of infection in the future.

Given the global trade in food commodities, routine monitoring of imported foods also plays an important role in sentinel surveillance of potential public health threats circulating in other parts of the world.



Scientific ambition 3:

Reduce and eliminate health threats

UKHSA will reduce and eliminate health threats by strengthening the scientific evidence underpinning our health protection programmes, both domestically and internationally. One of our key ambitions is to strengthen our contribution to global health security.

Centre for Pandemic Preparedness

Drawing on scientific and clinical expertise, the Centre for Pandemic Preparedness leads on resilient policies and strategies that underpin national preparedness. This collaborative work, involving cross-Whitehall engagement and close coordination with the Department of Health and Social Care (DHSC) and the NHS, has enabled a comprehensive review of current capabilities and helped identify critical gaps in future response measures.



UKHSA is responsible for delivering several programmes, each addressing a key aspect of pandemic readiness:

- Case, Contact and Outbreak Management
- Emerging Infectious Diseases
- Diagnostics
- Surveillance
- Ports and Border Health
- Public Health and Social Measures (PHSM)
- Communications

These programmes build on the lessons from the [COVID-19 Public Inquiry](#) and from a national-level exercise involving ministerial participation and Cabinet Office Briefing Rooms [COBR], Exercise Pegasus (see more on [page 34](#)). This experience, along with learning from incident responses led by UKHSA including recent outbreaks of Mpox and most significantly the national response to H5N1 (avian influenza), have led to improvements across several critical response areas:

- expedited plans for surge response
- investment in new equipment for the Respiratory Virus Unit National Reference Lab
- completed analysis for options for scaling up surveillance systems
- decisions to increase our stockpile of multiplex lateral flow devices (LFDs)
- development of an enhanced vaccine/therapeutics plan

We have developed draft respiratory PHSM advice and principles to support the development of sector-specific guidance on PHSM. This is accompanied by an evaluation framework, monitoring tool, and a theory of change model to support a wide range of evaluation methodologies for the effectiveness of PHSM.

We have also delivered a new high-throughput PCR (Polymerase Chain Reaction) testing laboratory within the UKHSA estate through Project Amplify, enhancing the nation's preparedness and resilience. This project - completed end to end within 2025 - has delivered a fully equipped, fit-for-purpose facility with a capacity of 24,000 PCR tests per day. This enables teams to align workflows, enabling trials of new automation, workflow optimisation and data analytics. There are direct health benefits, as this project has ensured surge testing capacity can be activated within weeks, enabling faster detection and containment of infectious disease outbreaks.



Case Study 5



Training in normal times, pandemic preparedness and capacity strengthening

The Novel and Dangerous Pathogen Training team at UKHSA provides [training](#) and support to empower those in LMICs to improve their capabilities in working with infectious samples safely. This is important as many outbreaks and diseases occur in these areas and it is vital that these countries can sample, diagnose and store samples securely. Biosafety and biosecurity are of increasing importance; with research into these outbreak samples there is a need for highly infectious samples to be transported safely and the data held securely. We have undertaken several programmes of work, for example under the Chemical, Biological, Radiological and Nuclear (CBRN) Centre of Excellence in Biosafety and Biosecurity. These projects have focused on working safely with high consequence pathogens, the safe transportation and storage of highly infectious material and developing best practice in waste management.

Next steps: Looking ahead

To broaden the impact and global relevance of biosecurity, we are exploring further strategic collaborations with both existing and new stakeholders. Specific projects include:

- secure storage and transport of Ebola-positive samples to create biobanks
- comprehensive, end-to-end training for the safe handling of highly infectious patient samples using glove boxes in the field including outbreak scenarios
- realistic outbreak simulations to strengthen response capabilities
- expansion of digital training resources, including instructional videos, e-learning modules and bite-sized remote training sessions

Chemical Radiation and Nuclear

UKHSA has strengthened its ability to respond to radiation and nuclear emergencies through a continuous improvement programme informed by lessons identified through response, exercising and 'joint organisational learning', across the UK emergency responder community. Specific advances include the development of guidance pathways for more specific situations that members of the public may find themselves in when an emergency occurs; guidance for local responder organisations on how UKHSA will operate within Radiation Monitoring Units (RMUs); and increasing the Agency's capacity to assess long-term exposure to radioactive material that may remain within the environment once an emergency has been declared over.

An emergency which results in the dispersal of radioactive material into the air can potentially affect large numbers of people who will need to be checked for any residual contamination to provide them with reassurance or inform any further need for decontamination or medical assessment. For large numbers of people, this is best achieved using a RMU as a facility which can be established close to the incident, providing sensitive monitoring for radiation on or in people. UKHSA leads the technical radiation monitoring aspects of RMU operation as the leading capability within the UK.

After an emergency situation, there is a long period of recovery which will require ongoing assurance that members of the public are not being exposed to radiation above agreed levels. Experience in Japan following the nuclear accident at Fukushima demonstrates that this is a long-term requirement. We have enhanced our capacity to issue personal radiation detectors to a representative population in affected areas. We have done this with flexibility to meet the sudden increases in demand for personal radiation detectors for worker monitoring, as was seen during the COVID-19 pandemic.



Case Study 6



Tachyon a field-deployable molecular diagnostics platform

UKHSA in partnership with HQ Science Limited has developed a device named 'Tachyon'. Tachyon is a point-of-care field-deployable molecular diagnostics platform designed to enhance response capabilities during radiological emergencies. Tachyon aims to limit laboratory dependency by integrating nanopore sequencing with real-time bioinformatics analysis, allowing for rapid, accurate, and actionable diagnostic results directly at clinical sites or triage locations without specialised laboratory infrastructure or personnel. The three-year project was completed in July 2025. We are now actively enhancing the commercial capabilities of the platform by broadening its diagnostic potential into additional areas such as precision diagnostics in oncology and sepsis in collaboration with HQ Science.

We have continued to enhance our analytical toxicology facilities, launched the Health Protection Research Unit (HPRU) in Chemical Threats and Hazards and established a toxicology and health protection community of practice.



UK Public Health Rapid Support Team

UKHSA contributes to global health security both by providing direct support and through development initiatives to build capacity and capability abroad.

The UK Public Health Rapid Support Team (UK-PHRST), funded by official development assistance via DHSC, provides outbreak response, research, and capacity building in LMICs. Over 20 UKHSA scientists have supported outbreaks, including cholera in South Sudan, Mpox in the Democratic Republic of the Congo, South Africa, and Kenya, and Marburg virus in Rwanda and Tanzania. The team also delivered 100 capacity-building activities and 12 research projects.

Examples of our work include supporting Africa Centres for Disease Control and Prevention (CDC) in developing its continental framework for operational research during public health emergencies by providing subject matter expertise and drafting support, scheduled for launch in 2026.

UKHSA has collaborated with the World Health Organization Global Outbreak Alert and Response (WHO GOARN) on standards for Rapid Response Mobile Laboratories (RRMLs), validating them through simulations and forming a global RRML community. UK-PHRST also supports RRML development and biosafety training in LMICs.

WHO Collaborating Centres

UKHSA has also continued to support the WHO by hosting WHO Collaborating Centres. In 2024/25, UKHSA established Collaborative Open Research Consortia on 2 viral families, Arenavirus and Bunyavirales, and has hosted global expert meetings to progress a research and development roadmap for Oropouche virus.

Through the WHO Collaborating Centres we have participated in country Joint External Evaluations, supported the development of national action plans, and provided expert advice on mass gatherings to Santé publique France for the Paris 2024 Olympic and Paralympic Games. The Agency also hosts 8 WHO Affiliated Laboratories.

Case Study 7 [Click title for link](#)

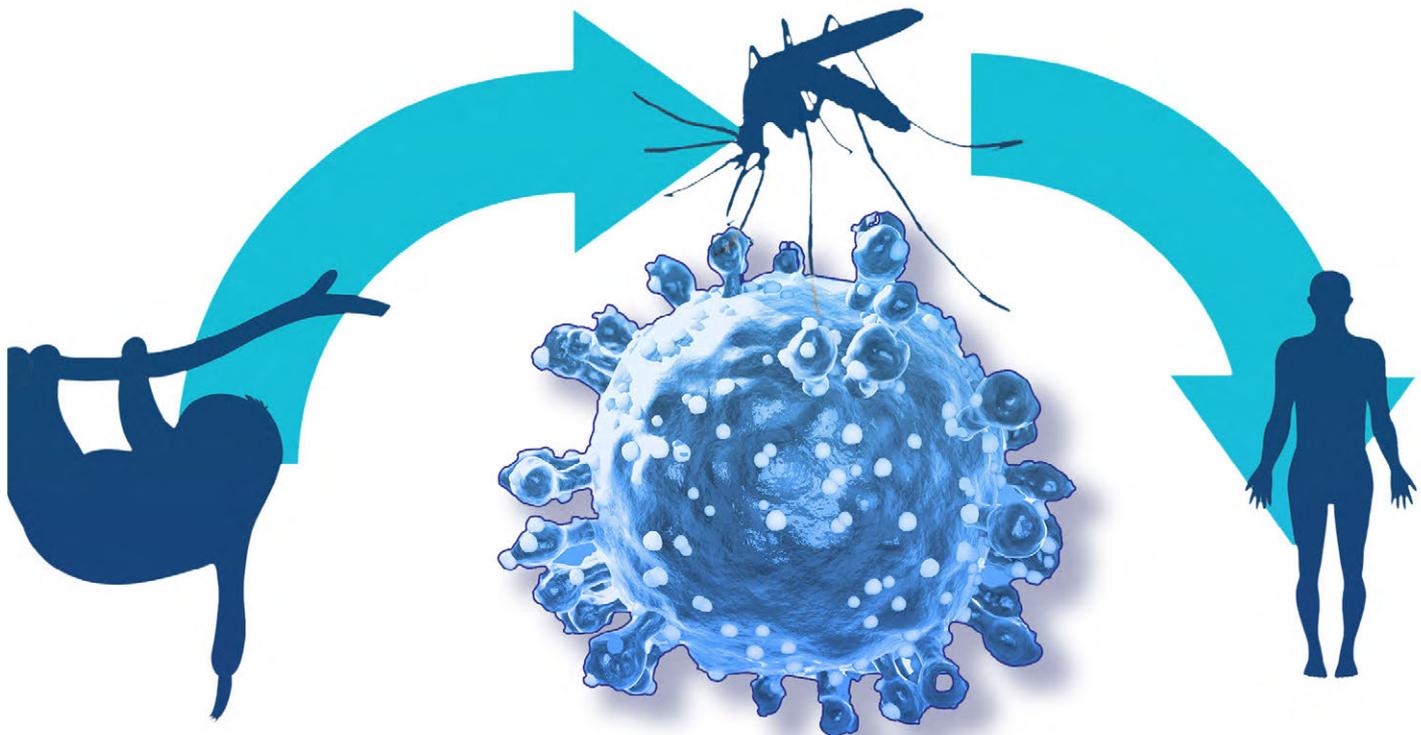


Oropouche virus

As part of global pandemic preparedness efforts, UKHSA is leading Collaborative Open Research Consortia (CORC) on behalf of the WHO, including one for viruses in the *Bunyaviricetes* class. An objective of the *Bunyaviricetes* CORC is to establish an R&D roadmap describing priorities for outbreak preparedness for Oropouche virus. To do so, we organised a virtual workshop with international experts to identify expert-led research priorities that informed the subsequent [R&D roadmap](#) and research priorities produced by the CORC.

In addition, the UKHSA science evidence review team produced an evidence gap map based on rapid systematic methodologies to identify evidence gaps on Oropouche virus that we published in August 2025 (see the [Evidence Gap Map report](#) and the [interactive gap map](#)).

The evidence gap map produced by UKHSA complemented the CORC R&D roadmap by providing the evidence base to support the priorities identified. The expected impact of the CORC approach and corresponding R&D roadmap is an effective and efficient use of resources, including funding, to investigate research priorities for global pandemic preparedness, strengthening health security and saving lives.





Scientific ambition 4:

Act on the evidence

Our Science Strategy outlined how we will ensure that all our health protection programmes and activities are informed by the best scientific evidence, by working in partnership with the National Institute for Health and Care Research (NIHR) Health Protection Research Units, other academic colleagues, NHS, local authorities and other partners. We will systematically identify gaps in evidence and work with research funders and other partners to ensure that these are addressed.

UKHSA acts on the scientific evidence generated by our teams, our partners and the wider scientific community. This involves translating data, knowledge and insights into practical actions that prioritise the protection of people and places most at risk, along with quick and consistent assessments of how different threats impact different population groups. We are doing this by developing UKHSA's capabilities in behavioural, social and implementation science, as well as operational research which supports effective and targeted delivery through multi-disciplinary endeavours. We are working with the NHS, local authorities, devolved administrations, and local communities to inform the development of public health guidance, policy and practice.



EVIDENCE

We also engage and support UKHSA health protection practitioner and field epidemiology research and development networks, ensuring our work is fit for purpose and informed by frontline practice to address local needs and emerging priorities. In doing so, we bridge the evidence-to-practice gap. Notably, UKHSA is involved in many undergraduate and postgraduate education endeavours with many higher education institutions nationally and beyond. This further strengthens the dissemination of our science, ensures the longevity of our impact and raises the profile of our work to academic audiences and beyond.

Science and research frameworks

Our Science Strategy highlighted the importance of scientific evidence and research as a key enabler. We have built on this during 2025 by delivering 3 frameworks:

- Research Prioritisation Framework, used to provide a robust, transparent, inclusive and responsive approach to identifying evidence gaps and prioritising research questions. This framework has been applied in UKHSA to aid prioritisation of research and evaluation gaps for incidents such as *Candidozyma auris* and Mpox
- [Framework for Integrity and Independence of UKHSA's Science and Research](#), outlining the principles and processes in place within UKHSA to ensure that our science is trustworthy, ethical and responsible, and that it is free from undue influence, including unwarranted policy, political and commercial influences
- Research Impact Framework, describing the approach to demonstrate impact on health, growth and scientific advancement of UKHSA's scientific and research activities



Academic partnerships

We have developed public, patient and community involvement and engagement in research guidance to ensure that patients and the public are involved in the design, conduct and dissemination of research activities.

We are working with the 13 NIHR Health Protection Research Units (HPRUs) and 2 Focus Awards on key public health challenges.

We have strengthened research capacity through our PhD studentship scheme and our contribution to Centres for Doctoral Training (CDT), for example the CDT in Health Data Science with Oxford University. We have also undertaken joint projects with the London School of Hygiene and Tropical Medicine, the Wessex One Health Doctoral Training Programme providing reciprocal PhD arrangements with the Animal and Plant Health Agency and the Pirbright Institute, PhD and other early career training through our HPRUs.

UKHSA is also supporting 2 PhD studentships within the Engineering and Physical Sciences Research Council (EPSRC) CDT in Healthcare Data Science at Oxford University. This CDT is the only healthcare-focused centre funded in the 2025–2032 EPSRC round and aims to train quantitative science graduates in real-world data science applications.

PhD profile Jasmine Hall

“My PhD is a collaborative project between UKHSA and the Health and Safety Executive (HSE), accredited through The Open University’s Affiliated Research Centre scheme. My research investigates metal-particle inhalation exposure using exhaled breath condensate, focusing on high-risk occupational groups such as welders. I am delighted to be pursuing this PhD within the analytical toxicology team at UKHSA, where I can combine my academic background in chemistry with my industry experience in exposure assessment to help reduce health risks in both public and occupational environments.”



Behavioural Science and Insights

The UKHSA Behavioural Science and Insights Unit (BSIU) brings together complementary behavioural and social science and social and market research skills to provide data, advice, insight and expertise across UKHSA. It provides subject matter expertise on human behaviour and health protection, advising on research and co-creation methodologies, data collection, and analysis and intervention design across UKHSA, with its partners, across UK government and internationally. During 2025, BSIU led and contributed to UKHSA's work on diverse topics such as vaccine uptake, climate change and health security, AMR and emergency preparedness and response, among others. The Unit also plays a leading role in the delivery of the new NIHR-funded HPRUs. In addition, BSIU have helped to lead a cross-Government initiative to coordinate social and behavioural science advice in emergencies, which has been rapidly mobilised in support of a number of emerging risks and threats.

The Unit's work to strengthen capacity and capability in the social and behavioural sciences has seen it deliver a range of training sessions and workshops for diverse non-specialist audiences, including in support of the UKOTs programme, and partnership with the WHO on the development of new social science research guidance for outbreak response. UKHSA's use of social and behavioural science to shape its research, preparedness and public health responses helps to ensure its activity is grounded in robust evidence, and its public health interventions and communications are designed with people and communities at the forefront.



Case Study 8



Behavioural Science contribution to Exercise Pegasus

Public behaviour is crucial in shaping health outcomes during outbreaks and pandemics. Those in affected communities may change their behaviour in a variety of ways, in response to both the pandemic itself and the actions taken by authorities to manage it. Behaviours are likely to be predominantly protective and prosocial, with some less common maladaptive responses. Evidence from the behavioural and social sciences is required to understand the individual, social, and contextual factors that shape public behaviour. This enhanced understanding can be incorporated into emergency preparedness exercises, to ensure that the public response is represented accurately and consistently, and that exercise outcomes are realistic.



During 2025, the UKHSA BSIU were closely involved in the planning, delivery and evaluation of a tier 1 pandemic simulation: Exercise Pegasus. BSIU played a key role in the delivery of Exercise Pegasus through rapid surveys and focus groups with members of the public, including groups likely to be disproportionately affected in a future pandemic. A Societal and Behavioural Scenario Working Group brought together existing evidence and new data collected during the exercise which was used to inform the fictitious pandemic scenario as the exercise unfolded. A key innovation was the integration of real-time public data into the exercise, allowing for dynamic adjustment of the scenario based on real public attitudes and behavioural intentions.

This was the first time behavioural data was directly incorporated into infectious disease modelling for a preparedness exercise, generating novel insights into public knowledge, attitudes, and behaviours in the post-COVID-19 pandemic context. It shows the critical value the social and behavioural sciences make in shaping effective, evidence-based responses to public health emergencies. This work underscores the necessity of embedding behavioural science and insights into preparedness planning, ensuring that future responses are grounded in both scientific evidence and the lived experiences of communities.

Health equity

The COVID-19 pandemic exposed and exacerbated health inequalities which resulted in some groups and populations experiencing a higher likelihood of negative outcomes. There are substantial gaps in the evidence base regarding the burden of hazards to health, and the effectiveness of interventions, which are starting to be addressed and translated into action.

As part of our [Health Equity for Health Security Strategy for 2023-2026](#), we adapted the [NHSE CORE20PLUS framework](#) to identify population groups who routinely experience inequalities in health protection at a national, regional and local level. This framework provides a structured way to ensure consideration of people and communities across UKHSA's work. In 2025, we developed health equity checklists based on the CORE20PLUS framework to systematically embed health equity considerations in rapid and systematic reviews to consistently identify and synthesise equity related findings, report them transparently and identify evidence gaps. The health equity checklists have been published as a [preprint](#), awaiting peer review.

Through UKHSA's partnerships with the HPRUs, UKHSA has been working with partners to ensure an equitable and inclusive approach to all research, through co-research and inclusion leads, shaping new projects to meet specific evidence gaps and translate evidence into practice. For example, we worked with the Emergency Preparedness Resilience and Response HPRU to collate and package evidence around communication during outbreaks into a toolkit for local practitioners, to publish alongside the [Communicable disease outbreak management guidance](#).

UKHSA has also commissioned specific research which is now influencing policy and practice. This includes the [Inclusive Approaches to Health Protection](#) report, which summarises findings from a range of population groups and voluntary and community sector organisations to inform the commissioning and delivery of health protection services. Other examples include UKHSA's PHSM advice and guidance, which has been underpinned by a range of evidence reviews including on the wider impacts of these measures for specific population groups; and the recent publication of the [Management of tuberculosis in secure settings in England guidance](#), which is underpinned by data, evidence and qualitative insights.

As outlined in [case study 1](#) (profiling hepatitis C virus - HCV) new technologies allow us to leverage new data to achieve more equitable outcomes for a variety of demographics. Genomic data can be used to detect transmission clusters in marginalised populations, such as people who inject drugs, and inform design interventions as outlined below.



Case Study 9



Non-toxigenic *C. diphtheriae* in people experiencing homelessness

Respiratory or cutaneous diphtheria is caused by toxigenic strains of *Corynebacterium diphtheriae* (*C. diphtheriae*), *C. ulcerans* and very rarely *C. pseudotuberculosis*. Non-toxigenic strains of corynebacteria may present with a range of clinical presentations and severity. Cases and clusters of aggressive endocarditis caused by non-toxigenic strains are reported in the international literature but remain rare.

Between July 2024 and January 2025, 5 male patients, in their early 20s to early 50s were confirmed with severe infective endocarditis associated with non-toxigenic *C. diphtheriae* in England. Three were known to have experienced homelessness and all 5 used non-intravenous recreational drugs. Disease progression was rapid, four patients required surgical intervention, one died.

This unusual cluster of cases prompted a multi-agency investigation during 2025, to understand the pathogenesis, risk factors for severe disease, likely source and routes of transmission. The UKHSA worked with NHS hospital clinicians, drug and alcohol community services and the Office for Health Improvement and Disparities (OHID), to raise awareness and share treatment recommendations.

Clinical and laboratory enhanced surveillance combining case finding with whole genome sequencing of bacterial isolates highlighted that strains causing endocarditis were genetically very similar to non-toxigenic *C. diphtheriae* causing a background of milder disease (mostly wound infections), with a predominance of multilocus sequence type ST559, in people with a chaotic lifestyle in cities across regions in England.

A prevalence study was also undertaken in hostels and shelters over the summer in London. This provided an initial low prevalence estimate of 0.48% (CI 0-1.93%). However, cases of wound and systemic infection in this vulnerable population continue to arise, and work is ongoing to maintain awareness amongst clinicians and community services to ensure timely access to healthcare, prompt diagnosis and treatment.

Recognising the importance of ensuring evidence is translated into action, UKHSA has launched the [Health Equity in Health Protection Initiative](#), to provide a platform for UKHSA's evidence products on health equity for partners to benefit from. In 2026 we will build our networks and convene partners to share learning and opportunities for implementation.

Case Study 10



Updated tuberculosis guidance in secure settings: evidence base

[TB notifications in England](#) have continued to rise, increasing by 13.6% in 2025, though England remains just below the WHO threshold for a low-incidence country. In prisons, people with a history of imprisonment now have TB rates around four times higher than the general population. To tackle this effectively, [updated guidance](#) for partners and stakeholders on TB screening, prevention and treatment access in prisons, immigration removal centres (IRCs) and approved premises, was required.



The new guidance is backed by a substantial body of evidence, including an expert agreement developed through a multi-agency clinical reference group under the [National Partnership Agreements](#) between UKHSA, His Majesty's Prison and Probation Service, NHS England, the Home Office, NHS TB services, secure-setting healthcare providers and people with lived experience of imprisonment. This group synthesised recent research to develop consensus statements informing both a ministerial submission and the guidance. Issues assessed included the feasibility of universal chest X-rays for close contacts and the appropriate use of telemedicine among others.

Additionally, a biobehavioural multi-pathogen survey conducted in 8 prisons and 2 IRCs found 7.5% positivity for current or historic TB infection, while a review of 6 outbreak reports showed that 10% of cases occurred among staff. This has led to a number of recommendations, including moving from single to double entry screening with sputum culture, and emphasising the need for adequate personal protective equipment (PPE) for prison staff.

The guidance also provides evidence supporting cost-saving Latent Tuberculosis Infection [screening for prisoners](#) from high- and medium-incidence countries where possible. [Awareness-raising resources and activities](#) for prisoners, staff members and healthcare workers, are embedded within the guidance and recognised as an ongoing priority. Together, these measures will strengthen TB prevention, detection and management across secure settings. National evaluation of the guidance's impact is ongoing.

Scientific ambition 5:

Unlock the potential of our assets

Our final ambition was to secure and develop the health protection scientific capabilities required to respond to future threats. These assets are a combination: cutting edge research in specialist scientific facilities with the deep expertise of our talented scientific workforce. Together they are delivering the health protection science of the future.

Pioneering research: Growth Through Science

UKHSA works in collaboration with other parts of the life sciences ecosystem to develop new ways of protecting people and saving lives. This involves working with industry and academia in the triple-helix model across the value chain of new intervention development (see [case study 11](#)).



Over 2025 UKHSA piloted a Growth Through Science (GTS) initiative with the aim of amplifying the contribution of our scientific assets to the national growth agenda and health protection. The GTS pilot has strengthened health protection science in diagnostics, vaccine and therapeutics development. This is in line with the [100 Days Mission implementation report](#), published on 31 January 2025, which identified diagnostic and countermeasure capability development as important for a resilient pandemic response.

GTS: developing countermeasures

UKHSA's Vaccine Development and Evaluation Centre (VDEC) was one of 3 centres established in the first years of the Science Strategy, alongside the Centre for Climate and Health Security ([page 16](#)) and the Centre for Pandemic Preparedness ([page 22](#)).

VDEC partners closely with commercial life sciences organisations in getting safe, proven, new vaccines to market. For example, by testing the efficacy of new vaccines using assays developed and validated at UKHSA's laboratories in Porton. Throughout 2025, 45 vaccine and therapeutic regimens were evaluated by our preclinical team in in vivo studies for stakeholders, including strategic partners such as Oxford Vaccine Group, EU consortia, Moderna, CEPI and AstraZeneca.

The GTS pilot supported the development of 'organ-on-a-chip' technology, where the development of immune-competent human alveolus on chip model will be ready as a tool to assess medical countermeasures against seasonal diseases such as influenza and SARS-CoV-2 variants in 2025 and 2026.

The presence of antibiotics in serum samples hinders correlate of protection, a measure of immune response, and vaccine studies due to interference with immunological killing assays. As part of the Gates-funded GASTON consortium, UKHSA has developed a novel method for the removal of antibiotics from serum samples with minimal impact on antibody levels and killing titres. This novel development gives the ability to perform seroepidemiological studies and will advance vaccine pipelines.

We continue to expand our portfolio of techniques in support of *in vivo* studies, including chromogenic immunohistochemistry for pathogen antigens and cell markers, RNA *in-situ* hybridisation and multiplex immunofluorescence to study cell interactions at sites of infection, the characterisation of the local immune responses and the distribution for a range of priority pathogens. These methods allow us to determine the impact of countermeasures on pathogenic disease at a cellular level.

Following on from evidence given by UKHSA to the Parliamentary Science and Technology Inquiry on Phage Therapy in April 2023, we are supporting the translation of phage therapy to a clinical setting with support from the GTS pilot. Work has focused on developing a model for a phage service to support compassionate use of phage (supported by CF Trust/LifeArc), innovating in rapid susceptibility test methods and exploring routes to establish Good Manufacturing Practice capability in the UK.

Case Study 11



A 'fridge-free' vaccine

The WHO estimates that about half of all vaccine stocks are wasted around the world because of cold chain breaches and never get into people's arms. Having a vaccine which can be kept at room temperature will be a pivotal step in reducing wastage and improving immunisation globally, in alignment with WHO and UKHSA goals.

In pursuit of a 'fridge free vaccine' VDEC have tested serum samples taken from clinical trial participants to determine antibody levels to *Tetanus toxoid* and *Diphtheria toxoid*, the key components in the Stablepharma vaccine (SPVX02).

The first-in-human trial assesses SPVX02's safety, immune response (immunogenicity), and tolerability, comparing it to existing vaccines. Data from the study will support SPVX02's submission to the UK's Medicines and Healthcare Products Regulatory Agency for potential licensing.



GTS: developing an X-Ray irradiation service

The GTS initiative is developing the X-ray irradiator capability to develop a service, providing inactivated biological material to external stakeholders across academia and industry.

X-ray irradiated reagents are unique materials that can be used for the development and evaluation of innovative diagnostic technologies and new assays without the need for specialist containment facilities by the end user. Conventional inactivation techniques, such as chemicals or heat, break viral particles or internal structures apart causing morphological changes which prevent use in point of care tests such as LFDs. When inactivating via X-ray irradiation all antigens and nucleic acids are kept intact and viral structure is maintained. This provides a single unifying reagent for development and assessment of LFDs and other molecular diagnostics. The need for high containment facilities to handle hazardous pathogens for diagnostic development and evaluation is then negated, relieving pressures on specialist facilities, whilst reducing cost and expediting work at lower containment. UKHSA is currently the UK sovereign capability for pathogen inactivation utilising X-ray irradiation.

UKHSA was successful in supporting early-stage development and rapid evaluation of LFDs during the COVID-19 pandemic by providing X-ray irradiated Covid strains. This material was also utilised for the roll out of new assays and provision of assay assurance in subsequent incidents. We have subsequently irradiated Mpox Clade IIb as part of the response to the 2022 outbreak and have begun work on irradiating the most recent circulating strain (Ib) to assess LFDs. Zika virus has also been irradiated as part of a UK Vaccine Network funded project to determine whether irradiated virus could be utilised in future vaccine development, demonstrating how this capability can be exploited further.

The funding provided by the GTS initiative has allowed validation of methodologies to increase the throughput, thus improving cost efficiencies. Irradiated material can then be provided to external stakeholders and build upon other materials already available via the National Collection of Pathogenic Viruses. Increasing the availability and repertoire of diagnostic material will allow UKHSA to respond to UK outbreaks more rapidly and appropriately, facilitating the research on emerging diseases at lower containment.



GTS: Improving diagnostics

UKHSA undertakes evaluation of a range of diagnostic modalities to ensure their efficacy and effectiveness, largely undertaken by the Diagnostic and Pathogen Characterisation (DPC) team.

Over 2025 diagnostic projects included the assessment of LFDs for Mpox and influenza A H5. This has been accompanied by a programme of technical and scientific training for our laboratory staff ensuring that they have the knowledge, skills and experience required to complete projects for PCR and LFD diagnostic evaluation at different levels of laboratory containment. The training has been supported by subject matter experts across UKHSA as well as by industry partners. The DPC team have been funded by the International Security Fund to assess the UK's onshore capability and review supply chain assurance for rapid scalable LFD manufacturing.

As well as looking at diagnostic technologies we are also working to address known barriers to PCR testing of Hazard Group 3 and 4 pathogens at the scale required in a pandemic. The DPC team are currently working on a project to evaluate the compatibility of pathogen-inactivating sample collection buffers with laboratory PCR and whole genome sequencing workflows.



Case Study 12 [Click title for link](#)



[Supporting Pathways to Antimicrobial Clinical Efficacy \(PACE\)](#)

This case study describes the utilisation and continued development of a platform set up by UKHSA to support and encourage the research community to discover and develop new drugs against infectious diseases, including difficult to treat infections, through partnership with PACE.

AMR is often referred to as the ‘silent’ pandemic. AMR-related infections claimed the lives of ~1.14million people globally in 2021 alone and can affect anybody, regardless of wealth, race, gender or country. AMR in bacteria and fungi refers to the ability of these pathogens to resist treatment by antibiotics or antifungals (collectively referred to as antimicrobials). Current antimicrobial drugs approved for use in the clinic are becoming less effective because of AMR, and the pipeline of new drugs to replace them is severely lacking.

The lack of an effective pipeline of new antimicrobials has resulted in predictions that by 2050, AMR will be the cause of at least 10 million deaths each year. Consequently, it is extremely important to invest in the discovery and development of new antimicrobials to fight this global public health threat.

We have developed an ‘open innovation’ model for the discovery and development of novel antimicrobials against WHO priority pathogens. We work openly with academics, small and medium enterprises and larger biotech companies to share resources and knowledge and to evaluate new therapies against our large library of clinical isolates of bacteria and fungi.

In uniting 2 key national assets, the UKHSA Open Innovation Platform and PACE, the partnership illustrates how UK innovation can be mobilised to meet national priorities and strengthen global health security.

Central to the ethos of this partnership is the training and support of the next generation of AMR researchers. By sharing methods, standards, and requirements for early-stage R&D, the platform is helping to equip researchers with both the skills and knowledge needed to advance the field.

In addition to its work with PACE, multiple patents have been filed by UKHSA with research partners and we are actively exploring commercialisation of key assets. For example, a research collaboration with iFAST Diagnostics to provide access to their underlying technology.



Securing the workforce of the future

The GTS pilots amplified the work of a small number of the 3,000 scientists and public health professionals that UKHSA employs across more than 30 scientific disciplines. Our staff are our most critical asset and enhancing the breadth and depth of capability, expertise and capacity within the UKHSA scientific workforce is critical to the success of the Science Strategy.

Scientific Talent Partners

Through our Talent for Science programme, we have made good progress in tackling challenging development and progression opportunities and uncompetitive pay. Informed by workforce data, 6 professions were identified to develop career frameworks, talent management strategies, communities of practice and healthy professional networks. The role of the 'Scientific Talent Partner' was created for each of these professions. In the first year of the programme, we recruited talent partners in Epidemiology, Bioinformatics and Genomics, and Toxicology, followed by Microbiology and Radiation Sciences in 2025.

Scientist profile: Dr Azadeh Peyman

(Scientific Group Leader, Electromagnetic Field Dosimetry and Radiation Sciences Talent Partner)

"I'm driven by curiosity about how electromagnetic fields interact with biological systems. I lead research on exposure and dosimetry to support health protection and policy. As a Talent Partner, I aim to tackle workforce challenges in radiation sciences by developing a Community of Practice to foster inclusive career development, mentoring and peer learning. This supports workforce planning and empowers staff to shape talent strategies. Looking ahead, I aim to explore emerging technologies and their implications for human exposure assessment, ensuring our science remains responsive to innovation and societal needs."



Field Epidemiology Training

UKHSA supports a range of training programmes to enhance our capability.

The long-standing UK Field Epidemiology Training Programme (UK FETP) is an accredited 2-year competency-based training programme that supports field and applied epidemiology capability development in the UK. This is part of the Training Programs in Epidemiology and Public Health Interventions Network (TEPHINET). It is supporting a global project under the umbrella of the Global Field Epidemiology Partnership to improve field epidemiology capability of WHO member states.

Building on FETP, we piloted and rolled out a frontline programme for health protection practitioners and scientists in our UKHSA regional teams. This programme has been impactful in improving the outbreak response and surveillance capabilities of participating frontline staff. The Structured Operational Research and Training Initiative (SORT-IT) will further strengthen our operational research capacity.

In 2025, in its second year of operation, evaluation has shown that this programme has improved staff capability to plan, undertake and publish operational research projects, sharing learning and good practice, and implementing changes in practice.

Scientific facilities

As part of our pandemic preparedness work, Project Amplify ([page 23](#)) established a new laboratory at our Porton site in 2025.

We continue to invest in and develop the 3 scientific campuses at Chilton, Colindale and Porton and the 2 smaller sites at Glasgow and Leeds. An active capital programme supports the provision of new laboratory capability, including:

- investment in containment level (CL) 3 SAPO IV facilities to enable work on the H5N1 virus
- new laboratory capability provided through a new Positron Emission Topography (PET) and Computed Tomography (CT) Scanner suite
- replacement of autoclaves at Colindale and Porton
- refurbishment of key facilities, including CL 3 facilities to improve operational efficiency and provide enhancement for user safety
- new analytical toxicology laboratories
- enhancements being made to physical security

In July 2025, the Secretary of State for Health and Social Care announced that UKHSA would be moving its scientific facilities at Porton and Colindale, as well as its corporate headquarters in Canary Wharf, to a new site in Harlow. The move will be completed by 2038. This is an exciting opportunity for the Agency to develop new scientific infrastructure to support cutting edge research and development throughout the 21st century and we are now actively developing plans for the Harlow site.

Looking forward to secure better health and prosperity

A single year can only partially illustrate the change journey that a 10-year strategy involves. Over 2026 we intend to refresh the Science Strategy in line with lessons emerging from the COVID-19 Public Inquiry, Exercise Pegasus and UKHSA's second Strategic Plan, which is aligned to the 3-year funding settlement and ongoing mobilisation of the NHS 10 Year Plan.

This will continue the generation and application of science for public health protection. The sort of action detailed in this review – with a focus on clear aims, rising to new challenges and working across the system to generate, disseminate and put into practice new evidence – describes so much of the activity across so many of the scientific teams profiled in this report.

If you'd like to know more about UKHSA's science and the partners we work with, please consider coming to our conference in Manchester on 22-23 September later this year.





Appendix A: Glossary

- AMR:** antimicrobial resistance
- BSIU:** Behavioural Science and Insights Unit
- CCHS:** Centre for Climate and Health Security
- CDT:** Centres for Doctoral Training
- CEPI:** Coalition for Epidemic Preparedness
- CL:** containment level
- COVID-19:** coronavirus disease caused by the SARS-CoV-2 virus
- DHSC:** Department of Health and Social Care
- EPSRC:** Engineering and Physical Sciences Research Council
- FETP:** UK Field Epidemiology Training Programme
- GTS:** Growth through science
- HCV:** hepatitis C virus
- HPRU:** Health Protection Research Unit
- IRCs:** immigration removal centres
- LFD:** lateral flow device
- LMICs:** Low and Middle-Income Countries
- mSCAPE:** Metagenomics Surveillance Collaboration and Analysis Programme
- NHS:** National Health Service
- NHSE:** NHS England
- NIHR:** National Institute for Health and Care Research
- PACE:** Pathways to Antimicrobial Clinical Efficacy
- PCR:** Polymerase Chain Reaction
- PHSM:** Public Health & Social Measures
- R&D:** research and development
- RMU:** Radiation Monitoring Unit
- RNA:** Ribonucleic Acid, a crucial nucleic acid similar to DNA
- RRML:** Rapid Response Mobile Laboratory
- SAPO:** Specified Animal Pathogens Order
- TB:** tuberculosis
- UKHSA:** UK Health Security Agency
- UKOT:** UK Overseas Territories
- UK-PHRST:** UK Public Health Rapid Support Team
- VBD:** vector-borne disease
- VDEC:** Vaccine Development and Evaluation Centre
- WGS:** Whole genome sequencing
- WHO:** World Health Organization
- WHO CCs:** World Health Organization Collaborating Centres

References

- 1 [UK Health Security Agency. 'UKHSA science strategy 2023 to 2033: securing health and prosperity'](#) 2025 (viewed on 26 January 2026)
- 2 Department for Business and Trade and others. ['Life Sciences Sector Plan'](#) 2025 (viewed on 26 January 2026)
- 3 Department for Business and Trade. ['The UK's Modern Industrial Strategy 2025'](#) 2026 (viewed on 26 January 2026)
- 4 UK Health Security Agency. ['UKHSA Pathogen Genomics Strategy'](#) 2025 (viewed on 26 January 2026)
- 5 UK Health Security Agency. ['UKHSA launches new metagenomic surveillance for health security'](#) 2025 (viewed on 26 January 2026)
- 6 UK Health Security Agency. ['UKHSA Health Equity for Health Security Strategy 2023 to 2026'](#) 2024 (viewed on 26 January 2026)
- 7 UK Health Security Agency. ['Using genomics to inform HCV treatment strategy and elimination'](#) 2025 Mbisa, T. & Bradshaw, D (viewed on 26 January 2026)
- 8 Food Standards Agency. ['PATH-SAFE: Changing the way we approach surveillance'](#) 2025 (viewed on 26 January 2026)
- 9 UK Research and Innovation. ['UKRI – UK Research and Innovation'](#) 2026 (viewed 26 January 2026)
- 10 UK Health Security Agency. ['National Collection of Pathogenic Viruses'](#) 2025 (viewed on 26 January 2026)
- 11 UK Health Security Agency. ['UKHSA data strategy'](#) 2023 (viewed on 26 January 2026)
- 12 UK Health Security Agency. ['UKHSA weekly winter surveillance bulletin'](#) 2026 (viewed on 26 January 2026)
- 13 UK Health Security Agency. ['Health inequalities in health protection report 2025'](#) 2025 (viewed on 26 January 2026)
- 14 UK Health Security Agency. ['Climate change: health effects in the UK'](#) 2024 (viewed on 26 January 2026)
- 15 UK Health Security Agency. ['Climate change and mental health report'](#) 2025 (viewed on 26 January 2026)
- 16 UK Health Security Agency. ['Beat the heat: staying safe in hot weather'](#) 2025 (viewed on 26 January 2026)
- 17 UK Health Security Agency. ['Turning Warnings into Action: The UKHSA WeatherHealth Alerting System Success Story'](#) 2025 Thompson R, Madera A, Milne G, Gordon Brown J. (viewed on 26 January 2026)
- 18 Department of Health and Social Care and others. ['UK 5-year action plan for antimicrobial resistance 2024 to 2029'](#) 2024 (viewed on 26 January 2026)
- 19 Impact AMR. ['Prioritising interventions to minimise the burden of antimicrobial resistance'](#) 2024 (viewed on 26 January 2026)
- 20 UK Health Security Agency. ['English surveillance programme for antimicrobial utilisation and resistance \(ESPAUR\) report 2024-2025'](#) 2025 (viewed on 26 January 2026)
- 21 UK Health Security Agency. ['Using network analysis of hospitals to identify novel C difficile strains rapidly and efficiently, hence enabling prompt initiation of control efforts'](#) 2025 Pople D, et al. (viewed on 26 January 2026)

- 22 UK Health Security Agency. '[Monitoring the microbiological safety of imported foods to protect UK consumers from foodborne diseases](#)' 2025 Willis C (viewed on 26 January 2026)
- 23 UK COVID19 Public Inquiry. [UK Covid-19 Inquiry](#) (viewed 26 January 2026)
- 24 UK Health Security Agency. '[Oropouche virus – collaborating across UKHSA to inform and develop the R&D roadmap of the Bunyaviricetes Collaborative Open Research Consortia \(CORC\) on behalf of the WHO](#)' 2025 (viewed on 26 January 2026)
- 25 World Health Organization. '[Oropouche virus research and development roadmap](#)' 2026 (viewed on 26 January 2026)
- 26 UK Health Security Agency. '[Oropouche virus: a rapid evidence gap map](#)' 2025 (viewed on 26 January 2026)
- 27 UK Health Security Agency. '[Evidence gap map: what evidence is available on the Oropouche virus?](#)' 2025 (viewed on 26 January 2026)
- 28 National Institute for Health and Care Research. '[Health Protection Research Units](#)' 2024 (viewed on 26 January 2026)
- 29 Simmons Z and others. '[Systematically Embedding Health Equity in Rapid Reviews of Public Health Evidence: The UKHSA Evidence Network Health Equity Checklists](#)' SSRN 2025
- 30 UK Health Security Agency. '[Communicable disease outbreak management guidance](#)' 2025 (viewed on 26 January 2026)
- 31 UK Health Security Agency. '[Lived experience: informing inclusive health protection](#)' 2025 (viewed on 26 January 2026)
- 32 International Pandemic Preparedness Secretariat. '[100 Days Mission Implementation Report 2024](#)'. 2025 (viewed on 26 January 2026)
- 33 UK Health Security Agency. '[Health inequalities in health protection report 2025](#)' 2025 (viewed on 26 January 2026)
- 34 [UK Health Security Agency](#). '[Tuberculosis in England, 2025 report](#)' 2025 (viewed on 26 January 2026)

About the UK Health Security Agency

UK Health Security Agency (UKHSA) prevents, prepares for and responds to infectious diseases and environmental, radiological and chemical hazards, to keep all our communities safe, save lives and protect livelihoods.

We provide scientific and operational leadership, working with local, national and international partners to protect the public's health and build the nation's health security capability.

[UKHSA](#) is an executive agency, sponsored by the [Department of Health and Social Care](#).

© Crown copyright 2026

Published: March 2026

Publishing reference: GOV-20220



You may re-use this information (excluding logos) free of charge in any format or medium, under the terms of the Open Government Licence v3.0. To view this licence, visit [OGL](#). Where we have identified any third party copyright information you will need to obtain permission from the copyright holders concerned.

Images on the following pages © Shutterstock: 18, 22, 28, 34, 35, 38, 40



UKHSA supports the Sustainable Development Goals

