



Department
for Environment
Food & Rural Affairs

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Public Health Protection Evidence Plan

**Policy portfolio: Animal Health: Surveillance,
Global Trade and Zoonoses**

Policy area within portfolio: Zoonoses

Timeframe covered by Evidence Plan: 2013/14 – 2017/18

Date of Evidence Plan: March 2013

This evidence plan was correct at the time of publication (March 2013). However, Defra is currently undertaking a review of its policy priorities and in some areas the policy, and therefore evidence needs, will continue to develop and may change quite rapidly. If you have any queries about the evidence priorities covered in this plan, please contact StrategicEvidence@defra.gsi.gov.uk.

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PB13923

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1. Policy context

What are the key policy outcomes for the policy programme/area?

The zoonoses programme supports the Coalition Agreement and the Government priority that 'it needs action to promote public health, and encourage behaviour change to help people live healthier lives'. It also supports the National Security Strategy by contributing to the National Risk Register which provides advice on how people and businesses can better prepare for civil emergencies.

This programme supports Priority One of the Defra Business Plan 2012-2015 to 'Support and develop British farming and encourage sustainable food production', and specifically under the heading 'to help ensure a secure, environmentally sustainable and healthy supply of food with improved standards of animal welfare.' It aligns with the *Guiding Principles for Animal Health and Welfare Policy and Delivery in England* of the AHWBE (Animal Health and Welfare Board for England). The Welsh Government is also committed to "improved animal health and well-being through environment, countryside and planning initiatives and decision-making in Wales". In Scotland, ensuring well-treated and healthy farm (and domestic) animals, contributes towards the Scottish Government's strategic objective of a 'Healthier, Wealthier and Fairer' Scotland. Within these, protecting public health from animal related threats is a critically important role for Defra and wider Government. This programme is also aligned with the Animal Health and Welfare Board for England (AHWBE) outcomes to develop and promote best practice for disease prevention to ensure good animal health of all kept animals.

Zoonoses are defined by the World Health Organisation (WHO) as any disease or infection that is naturally transmissible from vertebrate animals to humans. Disease can be spread by consumption of contaminated food, by direct contact with infected animals, or via the environment. Zoonotic diseases can have a major effect on human health, animal health and welfare, and cost the economy millions of pounds each year. For example, *Campylobacter*, the most commonly reported bacterial cause of gastrointestinal infection in the UK, is estimated to cause over 500,000 human disease cases annually in GB, accounting for a significant proportion of the estimated annual cost of food-borne illness (which is approximately £1.5 billion in England and Wales alone). (A Longitudinal study of infectious intestinal disease in the UK (IID2 Study): incidence in the community and presenting to general practice') Other important zoonoses such as *Salmonella*, *VTEC O157*, *Brucellosis*, *Toxoplasma*, *Hepatitis E* and *Q Fever* and *Anthrax* have the potential to cause serious human illness, death and loss of livestock production.

The Animal Health and Welfare (AHW) research budget is held by Defra on behalf of GB administrations.

2. Current and near-term evidence objectives

What are the current and near-term objectives for evidence and how do they align to policy outcomes?

The key objectives for the Zoonoses programme are to:

- Increase the understanding of the epidemiology and pathogenesis of zoonotic organisms in their animal hosts in order to be able to implement appropriate national surveillance and control regimes.
- Promptly identify the animal-associated risk of both known and new/emerging zoonoses or potential zoonoses
- Develop improved diagnostic and surveillance methods to enable early detection of outbreaks, thereby minimising their impact
- Identify and evaluate appropriate cost-effective on-farm intervention measures applicable to the UK situation to reduce the prevalence of zoonotic organisms in farm animals to mitigate the risk of transfer of zoonotic disease from animals to humans
- Inform the UK approach to current and future legislative developments for zoonotic pathogen control at the EU and national level
- Maintain a nucleus of expertise within the UK that can be called upon to provide expert input to Defra policy in the event of a threat to human health from zoonotic micro-organisms.

Defra, on behalf of the three GB administrations, funds a research programme to provide evidence that can be used to minimise the risk of zoonotic infections being transmitted to humans. For some animal-associated public health threats (both infectious and chemical hazards) the risk mitigation will also serve to enhance animal health and welfare. This programme focuses on three main pathogens, *Salmonella* spp., *Campylobacter* spp. and verocytotoxigenic *E. coli*. These diseases are ranked as of highest public health impact by Defra's disease prioritisation system (D2R2), although work on other food and water-borne pathogens is also supported.

The main non-research form of evidence in relation to zoonoses policy relates to surveillance. Defra, Scottish Government and Welsh Government hold budgets for and undertake some surveillance for zoonoses. It is primarily targeted on specific zoonotic issues, although the approach taken includes a focus on new and emerging diseases that on occasion may be zoonotic. Other benefits from this work include having UK-based experts available to provide technical guidance on policy options, not just with respect to national policy, but also helping to inform EU zoonoses policy direction. In addition to

government funded data we also liaise closely with the various industry sectors to benefit as far as possible from any additional evidence that may be available.

The following table lists the key policy objectives set out in column 1 and the associated current (column 2) and future (column 3) evidence needs.

Current, Near-term and Future-term evidence needs by policy objective

Policy objective	Current and near term evidence needs	Future term evidence needs
<p>To increase the understanding of the epidemiology (distribution, spread and control) and pathogenesis (disease causing potential) of zoonotic organisms in their animal hosts in order to be able to implement appropriate national surveillance and control regimes.</p>	<ul style="list-style-type: none"> • Clarification of whether infection in pigs can lead to infection in humans e.g. Hepatitis E • To determine whether vectors are viable to transmit disease if exotic zoonoses enter the UK. • To understand the significance of environmental (e.g. cat faeces) vs. the food borne route for human exposure in relation to toxoplasma transmission. 	<ul style="list-style-type: none"> • Social science to better understand the behavioural impacts on the distribution, spread and control of disease. • To determine the potential for bio-informatics in surveillance and control programmes.
<p>To promptly identify the animal-associated risk of both known and new/emerging zoonoses or potential zoonoses.</p>	<ul style="list-style-type: none"> • The continued collection and rapid analysis of surveillance information that can inform meaningful policy decisions. • Rapid analysis of the zoonotic potential and risk from a new or emerging disease. 	<ul style="list-style-type: none"> • Further refinement of discriminatory and rapid diagnostic tools • Improved Cost Benefit Analysis (CBA) and social science investigation to evaluate the impact of disease control measures on zoonotic disease risk – including those taken by farmers/ consumers/ public.

<p>To develop improved diagnostic and surveillance methods to enable early detection of outbreaks, thereby minimising the impact.</p>	<ul style="list-style-type: none"> • Information on changes in zoonoses in order to aid our ability to respond • The development and improvement of discriminatory diagnostic tests and capability, particularly for those organisms that are currently not well characterised and improvement of test performance and specificity • Improved knowledge of the UK livestock industry and structure changes, to aid our ability to respond to outbreaks. • How to affect behavioural change for example to improve under-reporting of notifiable zoonoses by farmers and private vets or to assess the impact of diagnostic testing carried out by industry. 	<ul style="list-style-type: none"> • Evidence in relation to DIVA vaccine & test development, where vaccine is seen as a route for control • Assessment of the potential for penside testing in early detection of outbreaks
<p>Identify and evaluate appropriate cost-effective on-farm intervention measures applicable to the UK situation</p>	<ul style="list-style-type: none"> • Data to support pig Salmonella control • Cost Benefit Analysis of feasibility and implementation of on-farm biosecurity measures for the protection of public and animal health • How to optimise control measures to protect the public at open farms from contact with animals • Further information on proper handling of contaminated manure 	<ul style="list-style-type: none"> • Social science to enhance uptake of available controls /mitigation • Further information on vaccine development where appropriate

Inform the UK approach to current and future legislative developments for zoonotic pathogen control at the global, EU and national level

- Continued trend monitoring and enhanced understanding of changes

- How to support capacity and suitable mechanisms and tools for effective horizon scanning
- Evaluation tools to assess integration and impact of science into policy

3. Future evidence needs

What are the longer-term evidence needs for the policy area/ programme?

A review of overall zoonoses priorities is carried out each year to ensure the correct strategy continues to be pursued in the most appropriate way. Where novel diseases or issues emerge, or new trends are identified the priorities are promptly re-assessed so that a rapid initial response can be initiated. Some developments may warrant new resource depending on the potential impact on the human (and possibly animal) population. Social science exploring the scope for alternatives to regulation and the associated research requirements is underway, including a review of behavioural evidence. Longer term linking the potential impact on the human population to actions across society may be an important avenue for investigation.

Future evidence needs will be identified and prioritised through outputs from current projects, internal formal reviews and in consultation with committees and organisations as described in Section 4. The table presented under Section 2 describes some of the longer term evidence aspirations in relation to the various objectives (These are shown in the third column).

4. Meeting evidence needs

What approach(es) will be taken to meeting evidence needs?

The approach to meeting R&D evidence needs is guided by standard Defra procedures. Prioritisation and specification of research is determined through discussion with policy colleagues (including SG & WG), veterinary advisors, disease experts, the Animal and Plant Health Evidence and Analysis (APHEA) team and livestock industry sector groups, as well as being informed by the Defra Risk Management Cycle. More recently, the AHWBE has also been involved in high level discussions over evidence needs.

The Animal Health and Welfare portfolio of R&D programmes is managed by a single Evidence Team, which enables very close working and easy identification of cross-cutting issues, which can be addressed in a complementary way. Amongst others, APHEA, the wider Defra Evidence & Analysis Community, and procurement processes also facilitate identification of opportunities for working across the Department on issues that affect disparate policy areas.

Evidence priorities are continually under review enabling Defra both to plan strategically and to swiftly react to emerging issues. Prioritisation is informed by sources of information such as:

1. Statutory requirements and evidence necessary to support a risk-based and proportionate approach to implementation of current and new EU legislation

2. EU information sources, including risk assessments and Scientific Opinions published by the European Food Safety Authority and other international Government and research institutions
3. Policy interface meetings to review completed and current research, results from surveillance including discussion of knowledge gaps
4. Expert opinion, advisory groups, consultation with UK stakeholders and new developments/advances in the industry sector that may directly or indirectly lead to a change in the potential impact of an animal associated threat to public health
5. Periodic reviews of the research programme including cost benefit analysis to determine public health benefits of the current programmes
6. An assessment of value for money of proposals received, both in terms of the cost and quality

During the year priorities are identified through the channels outlined above. Meetings are held between the policy team, representatives of the devolved administrations and evidence specialists. Evidence gaps are ranked based on short term and long term policy need, scientific likelihood of success, whether they will significantly augment our existing evidence base or help maintain essential scientific capability and the estimated cost of any proposed new research. Where appropriate, policy and science leads may convene to undertake a multi-criteria analysis that allows comparison of research across the programme.

Prioritisation of research requirements will be impacted by a number of factors, including the severity of health impact on animals and humans, how widespread the disease is, the time-frame for legislative change (e.g. adoption of EU Directives) the level of public interest and the availability of co-funding. Given the downward trajectory of R&D spend, the evidence needs identified in this plan reflect the highest evidence priorities where there is a case for Government investment. Prioritisation tools and process employed include, D2R2¹, the AHVLA Veterinary Risk Group (VRG) and assessment by the collaborative HAIRS group (Human-Animal Infections and Risk Surveillance group).

Gathering non-research evidence (primarily surveillance) within the zoonoses programme is mostly undertaken by agencies of the respective parent policy teams. In addition, non-Government bodies play an important role in evidence provision in relation to zoonoses,

¹ The D2R2 decision support tool was created to help prioritise animal health issues so that government efforts to detect and control animal diseases are directed at those which are likely to have the greatest risk and impact on society. It uses validated objective evidence to rank animal diseases on the basis of their relative importance in the context of the four reasons for government intervention (RFI), as defined by the GB Animal Health and Welfare Strategy. These are to protect public health, to protect and promote the welfare of animals, to protect the interests of the wider economy, environment and society and to protect international trade. It also provides disease briefing from a profile created for each disease and a means of risk assessment which reflects the level or likelihood of disease and current control measures.

for example, the operator sampling and official sampling undertaken by Independent Control Bodies as part of the National Control Programmes for Salmonella in poultry. In other areas close liaison with industry bodies has led to a sharing of data, and such collaborative approaches will continue.

In order to minimise duplication of laboratories and expertise within the veterinary sector across the UK and between the medical and veterinary sectors, the zoonoses programme collaborates with other official bodies and often co-funds research in order to meet its evidence needs². The UK Research and Innovation Strategy for Campylobacter, for example, led to co-funding of a number of research projects with the Food Standards Agency and BBSRC, and co-funding of research projects across the programme has also been successful with Industry, the Health Protection Agency, the Veterinary Medicines Directorate and other Member States. Participation in mechanisms such as ERA-net collaborative calls for research could bolster the international network of experts that Defra is able to tap into and also drive international collaborations that national centre of expertise can engage in.

Whilst there is consideration of the most appropriate method of evidence gathering in terms of whether resource exists internally, for example to conduct scoping secondary analysis of existing data, most major evidence needs are necessarily addressed through commissioning with an external research institute either through open competition or direct commissioning. All applications are peer reviewed externally and internally regardless of procurement route. Internal expert review engages policy colleagues, DAs, veterinary experts, scientists and, where appropriate, social researchers to ensure that all proposed research is challenged for policy relevance in line with government strategic objectives. External peer review engages academic experts as well as industry representatives to ensure there is both academic as well as operational challenge to all proposed research.

Research projects are monitored by annual reports, site visits and by advisory groups for larger projects that require a greater Defra and/or stakeholder steer. In addition, final reports are peer reviewed where appropriate and revised if necessary prior to publication on the Defra web-site. Researchers are also strongly encouraged to publish their results in peer reviewed journals.

5. Evaluating value for money and impact

What approach(es) will be taken to maximise and evaluate value for money and impact from evidence?

² Defra relies on other groups for surveillance information in relation to VTEC (human population), Cryptosporidium, Q fever. In addition, Defra/AHVLA carries out testing on behalf of the HPA, in relation to Brucellosis, Anthrax, VTEC and Rabies.

An effective multi- and inter-disciplinary approach to fulfilling evidence needs is ensured through use of relevant expertise, advisory bodies and collaboration with other funding bodies (e.g. BBSRC, FSA) both in GB and externally. There is also increasing engagement internally with teams such as APHEA team, which offer expertise in economic analysis and social science advice. Alongside external peer review, this ensures robust and high quality evidence. Value for money is considered in peer reviews of all project proposals received and subsequent close monitoring of projects.

Project specific dissemination strategies are developed at the start of every project to ensure effective communication, including how the evidence outputs will be used by policy. Completed projects are evaluated in terms of delivery, timeliness and policy impact either through internal or external review.

In relation to non-research evidence, value for money is ensured through monitoring of Service Level Agreements and contracts with agencies involved in supplying evidence. Alerts about new and emerging issues and trends are raised for consideration by the relevant policy team, and often by a collaborative group such as HAIRS or the Veterinary Risk Group at an early stage to allow available resources to be re-directed in a timely manner should new priorities be identified

The results of surveillance are externally published in collaboration with other contributors. The UK Zoonoses Report is published annually and records available data on incidence of a wide range of zoonoses, highlighting any trends identified in both the human and animal population. The Salmonella book is also published annually and records the results of the Salmonella monitoring program in all animal species (not just those covered by a National Control Programme) and in animal feed. Quarterly and annual reports on identifications of non-statutory zoonoses in Great Britain are published. Therefore the evidence gathered by this programme of work is widely available not just to policy makers but also to clinicians, researchers and academia, as well as to the general public. The gathered evidence is reported annually to the EU and published as the Trends and Sources report.

The evaluation of evidence in Defra is an important activity at project level and contributes toward ensuring that good quality, robust evidence is used to underpin departmental policy³. Evaluating the impact of evidence on policy development is complex and often only possible over the long term. Evaluation will necessarily be linked to Defra's Evidence Investment Strategy, which provides a strategic overview of how evidence fits with Defra needs. Programme level evaluation to assess the impact of evidence on policy will be explored (depending on available resource) following publication of the new Evidence Investment Strategy. It will be important that evidence currently being explored will have time to make an impact and for any new direction emerging from the new Evidence Investment Strategy to be tested and incorporated.

³ <http://archive.defra.gov.uk/corporate/docs/policy/evidence-policy-report.pdf>