



**FORESIGHT**

Infectious Diseases:  
preparing for the future  
Action Plan

OFFICE OF SCIENCE AND INNOVATION

# Infectious Diseases: preparing for the future

## Action Plan

*This report has been produced by the UK Government's Foresight project: Infectious Diseases: preparing for the future. Foresight is run by the Office of Science and Innovation under the direction of the Chief Scientific Adviser to HM Government. Foresight creates challenging visions of the future to ensure effective strategies now.*

## Introduction

The Foresight project 'Infectious Diseases: preparing for the future', has produced a challenging and long-term vision for the detection and identification of infectious diseases in humans, animals and plants. This vision has taken account of the evolving risk of diseases, changing user requirements for detection, identification and monitoring, and cutting edge science.

As with all Foresight projects, the aim is to inform the development of policy and strategy, and to catalyse action – within Government, stakeholder organisations, and also academic and business communities. The project achieves this by strengthening the body of interdisciplinary science evidence available to policy makers and technology developers.

This Action Plan sets out some of the undertakings that are now planned by various organisations, to use and take forward the project findings. The activities described reflect the wide range of national and international interest in the project's output. They also recognise that the future challenges of detection, identification and monitoring of infectious diseases will require both technical innovation and consideration of the societal context in which new systems will need to be deployed.

The Action Plan is intended to be a flexible document, with the various lines of activity responding to changing circumstances. It is planned that progress will be reviewed after a year by Lord Bach, the project's sponsoring minister in the UK Government, when he reconvenes the group of high-level stakeholders which provided guidance for the project.

Activity	Owner	Timing
<b>Department for the Environment, Food and Rural Affairs (Defra)</b>		
Defra welcomes the effort and commitment that the Office of Science and Innovation (OSI) and others have put into the Foresight project and will seek to review and take on board the findings, in the context of current policy activities and strategy development.	Lord Bach	
The project's sponsor Minister (Lord Bach) welcomes the opportunity for the findings of the report to be considered, both within the Department and with a cross-Government perspective, so that the implications may be considered by Departments in a co-ordinated manner.	Lord Bach	
<i>Specific work that Defra are currently undertaking that will be informed by the findings of the project:</i>		
A project, developed as part of the implementation of the Veterinary Surveillance and Animal Health and Welfare Strategies, to develop a transparent risk and impact, evidence-based model that will generate summary reports that quantify the relative importance of animal health and welfare issues in the context of the four reasons for government intervention. This will provide a decision-support tool for the prioritisation of work both in the area of emergency preparedness and surveillance for new and emerging diseases.	Surveillance, Zoonoses and Emerging Issues Division, Defra.	2006
The development of the Departmental strategy for Earth observation data, including its use for predicting the spread of diseases.	Science Directorate, Defra	
An active research programme in the field of animal and plant health, many components of which have been and continue to improve the diagnostic tools we have available.	Veterinary Exotic Diseases, Research and Official Controls Division and Plant Health Division, Defra.	

Activity	Owner	Timing
<i>Central Science Laboratory (CSL), Institute for Animal Health, Veterinary Laboratories Agency, Centre for Environment, Fisheries and Aquaculture Science, Health Protection Agency and Royal Veterinary College</i>		
<p>CSL will lead a Defra-funded multidisciplinary project ('Defra bio-security chip') to develop a diagnostic microarray ('lab on a chip') for the surveillance, detection and characterisation of quarantine and emergent viruses of plants, animals (including zoonotic), fish and bees. The consortium (formed whilst working on the Foresight project) will exploit the clear synergies between plant, animal and clinical virology which is a clear message from the project.</p>	<p>Dr Ian Barker, CSL</p>	<p>Timing: 2006-2009</p>
<b>Office of Science and Innovation</b>		
<p>Early detection and identification of diseases and the need for high-throughput screening of people at airports are two important areas (the report's 'User Challenge 4'), with important social and commercial dimensions, which the Technology Strategy Board will be considering in the near future.</p>	<p>Innovation, Allan Mayo</p>	
<p>Furthermore, the ability to capture large amounts of data and analyse/model them to predict outcomes or behaviour (the report's 'User Challenge 1') is an important feature of virtually all markets in the modern economy, such as retail and logistics, financial services and high performance engineering as well as the applications identified in this study, namely modelling the growth and spread of disease.</p>		
<p>We shall therefore be developing our strategies around Innovation Platforms with the benefit of the information contained in the report, and the supporting technical papers, and the networks of expertise which have been developed by the study. These will form an excellent starting point for taking forward our activities.</p>		
<p>DTI will use the work to inform the Bioscience and Healthcare aspect of the UK's Technology Strategy.</p>	<p>Business/ Innovation, Dr Bill Leitch</p>	

Activity	Owner	Timing
To work with Department of Health and others to ensure work on the role of the professional is supported by the OSI's public engagement programme	Science and Society, Gary Kass	
To ensure that the findings inform the work of the interdepartmental flu pandemic working group, co-chaired by the Cabinet Office and the Department of Health	Science in Government, Dr Chris McFee	
To work with others to build support for African Union/New Partnership for Africa's Development (NEPAD) in following up the Foresight project's Entebbe, Uganda workshop in August 2006 and other project output relating to Africa.	International, Dr Tracey Elliott	
OSI's Horizon Scanning Centre (HSC) will feed the implications of the project's findings where relevant into their interactions with a wide range of government departments as part of their horizon scanning activities.	Horizon Scanning Centre, Dr Rupert Lewis	
HSC will use the project findings to inform the work of its Future Analyst Network.		
HSC will ensure that findings and science reviews are incorporated into HSC's scans and other papers.		September 2006
<b>Department of Health (DH)</b>		
The Department of Health commits to considering the implications of the findings of the report when developing policy in relevant areas.	Sir Liam Donaldson, Chief Medical Officer, Department of Health	
<b>National Expert Panel on New and Emerging Infections</b>		
To review medico-veterinary collaborations in zoonoses surveillance and research and to make recommendations on further work in these areas.	Chair, currently Professor Chris Bartlett, and secretariat	2007

Activity	Owner	Timing
<b>Health Protection Agency (HPA)</b>		
Will debate the wider implications of the report with respect to its development plans and futures work	R&D Committee	November 2006
Will identify synergies with its existing 2005-2010 R&D strategy	R&D Committee	November 2006
Will seek to further strengthen its joint activities with the Veterinary Laboratories Agency through its existing Memorandum of Understanding and through the Interlab Forum	Chief Executive	January 2007
Will explore with key partners how current multiple pathogen detection for agents of bioterrorist threat can be adapted for conventional infectious diseases	R&D Committee	
Will explore with partners, especially the World Health Organization (WHO), & The International Association of Public Health Institutes (IANPHI) how the Agency can contribute to improved laboratory diagnostic capability, and public health expertise, in resource poor countries	International Office	
Will continue to develop and help evaluate near patients tests and bioinformatics information tools	R&D Committee	
<b>Home Office</b>		
The Home Office welcomes the findings of the report. It will consider the findings in light of the cross-Government CONTEST (UK Counter Terrorism strategy) Science and Technology Strategy and will use the appropriate outputs of the report to aid in the determination of future S&T requirements.	Crime Reduction and Community Safety Group, Ms Angela Singh	

Activity	Owner	Timing
<b>National Security Advice Centre (NSAC)</b>		
NSAC will use the work of this project to inform prioritisation and strategic planning of its protective security research programme – FY 06/07 and in NSAC’s 3-year plans.	Dr Rebecca Bowden (S&T co-ordinator)	
NSAC will also seek to work closely with those involved in the project to identify areas of mutual interest and ways to work together in the future.		
<b>Department for International Development (DfID)</b>		
DfID, as a key project stakeholder, will review the findings and use them as appropriate to inform in relevant areas of policy development.	DfID	
<b>Ministry of Defence (MOD) and Defence Science and Technology Laboratory (Dstl)</b>		
MOD has had a long interest in novel diagnostic methods to detect the presence of specific infective disease agents. We are committed to using advanced technologies for these tasks and we welcome the Foresight initiatives in this important field. We are also very committed to accurate data capture and the timely use of accurate data to inform decisions.	Chief Scientific Adviser, Professor Roy Anderson	
Chief Scientific Adviser (CSA) MOD and Dstl to consider the findings of this report and to ensure that MOD has the science base to respond in a timely way to disease outbreaks (existing and emerging) such that their impact is minimised.	CSA and Dstl	
To monitor developments in detection, identification and monitoring (DIM) technology so as to utilise them appropriately for the protection of UK armed forces from endemic diseases, biological warfare and terrorism. To ensure advances made in the military arena with respect to DIM are transferred to the civil sector where appropriate.	Dstl and MOD	
<b>Department for Transport (DfT)</b>		
DfT will ensure that any relevant project findings are fed into future work on the Data Grand Challenge.	Dr Jonathan Mosedale, Research & Technology Strategy Division	



Activity	Owner	Timing
<b>Research Councils UK and Research Councils</b>		
<p>The Foresight report and Action Plan present us with some important issues which we can consider as we move forward with a number of research programmes. Working individually and collectively through the Research Councils UK partnership, we will be considering the report recommendations as we formulate future policy and strategy, including in the context of SR07. Some specific examples follow:</p>	<p>Professor Julia Goodfellow, Biotechnology and Biological Sciences Research Council (BBSRC) Chief Executive, on behalf of Research Councils UK</p>	
<p>BBSRC will consider the implications of the report as it works with Defra on the £121M redevelopment of the Pirbright laboratory. This will provide new, secure facilities for virologists from the Institute for Animal Health and the Veterinary Laboratories Agency.</p>	<p>BBSRC</p>	
<p>Arts and Humanities Research Council (AHRC) to consider implications of report for Religion and Society Programme.</p>	<p>AHRC Research Development Group</p>	<p>March 2007</p>
<p>BBSRC to consider implications of the report for its work on Control of Infectious Diseases programme</p>	<p>BBSRC Animal Sciences Committee</p>	<p>September 2006</p>
<p>BBSRC to consider implications of the report for the Basic Technology Programme</p>	<p>BBSRC</p>	
<p>BBSRC to identify cross-Council data-sharing policies to provide better access to data, as part of its current development of its data policy</p>	<p>BBSRC</p>	
<p>BBSRC will seek to support cross-disciplinary areas of research identified in the report through mechanisms such as its mid-career Research Development Fellowship Scheme</p>	<p>BBSRC</p>	
<p>BBSRC and Medical Research Council (MRC) will consider the possibilities for further collaboration across natural and social sciences in areas related to the project as part of taking forward the work of the cross-Council Genomics Coordinating Committee</p>	<p>BBSRC, MRC, ESRC, EPSRC</p>	
<p>BBSRC will consider options for future opportunities for initiatives such as Rural Economy and Land Use (RELU)</p>	<p>BBSRC</p>	

Activity	Owner	Timing
<b>Research Councils UK and Research Councils (continued)</b>		
<p>Engineering and Physical Sciences Research Council (EPSRC) will consider implications for its basic technology and ICT/High Performance Computing programmes, looking especially at the priorities highlighted in the User Challenge on data mining.</p>	EPSRC	
<p>MRC will assess the implications of the report for MRC in relation to:</p> <ul style="list-style-type: none"> <li>(i) Current Infections and Immunity Board priorities in (a) global infections, (b) antimicrobial resistance &amp; healthcare acquired infections, (c) genomic epidemiology, and (d) potentially pandemic influenza.</li> <li>(ii) Further development of Council priorities for translational research, e.g. biomarkers [of infection and disease].</li> </ul> <p>The assessment will form the basis for refining existing strategies or developing additional priorities during 2006.</p>	MRC Infections and Immunity Board	<p>(i) June 2006</p> <p>(ii) December 2006</p>
<p>The Research Councils with the Wellcome Trust and the Department for International Development will consider the implications of the report for joint working within the context of the Funders Forum for Health Research in Developing Countries.</p>	MRC, ESRC	
<b>Royal Academy of Engineering (RAE)</b>		
<p>The RAE Working Group on privacy and surveillance will review the Foresight project findings and consider how they might be used to inform its activity and outputs.</p>	Working Group, Professor Nigel Gilbert	2006
<b>British In Vitro Diagnostics Association (BIVDA)</b>		
<p>BIVDA will review the project findings in relation to its work and the future of diagnostics in the UK and internationally. In particular, BIVDA is keen to ensure, as far as possible, that only validated, high quality, appropriately regulated devices are made available and that adequate records and standards are maintained. BIVDA will use the project findings to inform its members, in particular the POC Working Party, and will consider the steps required to realise the development and implementation of the four User Challenges.</p>	BIVDA	

## INTERNATIONAL ORGANISATIONS

Activity	Owner	Timing
<b>World Health Organization (WHO)</b>		
<p>As a key stakeholder to the Foresight project, WHO has welcomed the opportunity to work with OSI and to provide advice at the initiative's formative stages. WHO now looks forward to reviewing the project report and to assessing the implications for its activities.</p>	WHO	
<b>World Organisation for Animal Health (OIE)</b>		
<p>The World Organisation for Animal Health (OIE) will follow with interest the outcomes of the Foresight project as it relates to supporting and strengthening the implementation of the strategic objectives of the OIE – especially those objectives related to strengthening the capacity of Member Countries to participate in the development and application of international standards for animal health and zoonosis and strengthening the involvement of the OIE in policy design and governance related to animal health and zoonosis.</p>	OIE	
<b>Food and Agriculture Organization (FAO)</b>		
<p>FAO will review the project findings and consider how these might contribute to the development of key areas for policy and strategy. Of particular interest would be to explore the synergies between plant and animal disease work both within FAO and with other IGOs in the fields of human (zoonotic), animal, and plant diseases.</p>	FAO	

Activity	Owner	Timing
<b>International Potato Center (CIP), Central Science Laboratory and Veterinary Laboratories Agency</b>		
<p>New, emerging and endemic diseases present a continuing threat to food security and animal and human health in Africa; especially when capacity for surveillance and monitoring remains weak.</p> <p>In line with Foresight project conclusions and as a priority area for NEPAD's Comprehensive African Agricultural Development Program (CAADP), the Consultative Group on International Agricultural Research (CIP coordinating), along with key UK agencies (CSL coordinating, and VLA) and commercial diagnostic companies, will seek to progress capacity at the national and regional economic level for surveillance and diagnosis for plant and animal (including zoonotic) diseases in Africa.</p>	<p>Dr Charles Crissman, CIP</p>	<p>2006-2009</p>
<b>European Environment Agency (EEA)</b>		
<p>Further to discussions with EEA plans are now in place for the future work programme to include the results of the project in determining areas of Europe that are likely to be vulnerable to infectious disease arising from systemic changes in different habitats and ecosystems and exposure of the human population in contact with them. This work is intended to be carried out in partnership with the original partners from the DTI Foresight programme, European equivalents and the European office of the WHO, which is responsible for overseeing the environment and health programmes of the WHO.</p>	<p>Professor Jacqueline McGlade, Executive Director, EEA</p>	
<b>International Science and Technology Center (ISTC)</b>		
<p>International Science and Technology Center (ISTC) welcomes the opportunities for new research partnerships between Commonwealth of Independent States (CIS) and UK organisations that might be stimulated by the outputs of the Foresight project. ISTC will work with OSI to help catalyse such joint activity and will co-host an event to promote the development of UK-CIS partnerships on zoonoses.</p>	<p>Alan Monks, OSI International</p>	<p>May 2006</p>

*Details of all the reports and papers produced by the project can be obtained from the Foresight website ([www.foresight.gov.uk](http://www.foresight.gov.uk)).*

*Any queries may also be directed through this website.*

*The reports and outputs of the project should not be taken to represent the policies of any governments or organisations involved in the work.*

