Public Health England

NHS England

Adaptation Report for the Healthcare System 2015

This document is written by the Healthcare System Adaptation Report Working Group

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Sustainable Development Unit
Working across the NHS, Public Health and Social Care system

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Executive summary

Introduction

This report is written in response to the Department for Environment, Food and Rural Affairs (Defra) invitation to produce an Adaptation Report for the health sector as outlined under the Climate Change Act 2008 (CCAct)[1].

The health sector in England has made a joint collective commitment[2] to address sustainable development and climate change recognising that by doing so it can develop more resilient services and improve population health. This first sector-wide report covers the majority of the health system in England. However, although social care is integral to the health sector, it is not included in this report for pragmatic reasons of time and resources. It is hoped that social care can be included in future reports.

This report first outlines the risks resulting from climate change to the public's health and to service delivery. It then describes an overview of the health sector's response based on information collated from existing data and bespoke surveys. Lastly the report highlights a number of recommendations for the system to take forward.

Background

The Intergovernmental Panel on Climate Change (IPCC)[3] summarises the increasing impact of climate change and highlights in its latest report that the predictions are following a worsening scenario. The United Kingdom[4] is predicted to experience much greater rainfall leading to flooding during the winter, alongside drier summers with heatwaves and heightened air pollution.

The first Climate Change Risk Assessments[5] (CCRA) carried out for the UK in 2012 identified the top climate change risks for the UK and a public health report on the health effects of climate change was subsequently updated.

Summary of climate change risks to the health sector

The risks to the health sector include those to the health of the population, and risks to the delivery of services through changes in service patterns and to the infrastructure. Headline risks include the impact of heatwaves and overheating of buildings, increased risks of air pollution and its associated health effects, and the increasing likelihood of flooding events, alongside impacts on service disruptions and communities. The effects are expected to be unequally distributed, affecting deprived people and groups the most.

[1] http://www.legislation.gov.uk/ukpga/2008/27/contents
[2] http://www.sduhealth.org.uk/policy-strategy/engagement-resources/un-climate-summit.aspx
[3] http://www.ipcc.ch/
[4] http://ukclimateprojections.metoffice.gov.uk/21678
[5] http://randd.defra.gov.uk/Default.aspx?Module=More&Location=None&ProjectID=15747

The health estate infrastructure is unlikely to be resilient to the changing summer temperatures (particularly as hot summers days are already having an impact on hospital wards) and 9.5% of health care buildings are in flood risk zones[6]. Clearly these impacts also apply to partner services and supply chains which will have a knock on effect on the health of people and the health sector's ability to deliver care.

Health sector plans to address the risks

As part of the National Adaptation Programme[7] (NAP) the health sector has set itself two objectives that will help ensure the health system is resilient and adapted to climate change:

- to reduce mortality and morbidity associated with severe weather events and climate change
- to promote resilience and service continuity to ensure sound service delivery.

A number of plans are in place to support these objectives. Well established heatwave[8] and cold[9] weather plans help the health sector prepare and respond to severe weather events. Health Building Notes[10] provide a best practice approach to resilience and risks for the healthcare estate, including climate change, using a whole system approach to the healthcare estate and incorporating considerations into design, planning, procurement and use.

In addition, the Sustainable Development Strategy[11] (SDS) for the NHS, Public Health and Social Care system describes how a resilient sector can also be sustainable and reduce its impact on the environment. Indeed these are best considered jointly and in a collaborative manner to maximise benefits to all.

Local health systems hold the key to ensuring that services and communities are sustainable and resilient to climate change. The National Cross System Group[12] monitors and supports the health sector to make progress towards a more environmentally and socially sustainable system.

Monitoring mechanisms

The health sector needs to monitor the developing impacts of climate change, the effects on the population and the level of preparedness of services and communities. Public Health England (PHE) monitors the risks to the public through surveillance and monitoring mechanisms. The National Capabilities Survey[13] helps to establish the level of preparedness for emergency responses inherent across the sector. Sustainable Development Management Plans (SDMPs)[14] and annual sustainability

[6] Adaptation Sub-Committee (2014) Managing climate risks to well-being and the economy: Progress report 2014

[7] https://www.gov.uk/government/publications/adapting-to-climate-change-national-adaptation-programme

[8] https://www.gov.uk/government/publications/heatwave-plan-for-england

[9] https://www.gov.uk/government/publications/cold-weather-plan-for-england-2014

[10] https://www.gov.uk/government/collections/health-building-notes-core-elements

[11] http://www.sduhealth.org.uk/policy-strategy/engagement-resources.aspx

[12] This group involves representation and engagement from the breadth of the health and care system organisations to ensure an effective system-wide approach to sustainable development.

[13] https://www.gov.uk/preparation-and-planning-for-emergencies-the-capabilities-programme

[14] http://www.sduhealth.org.uk/delivery/plan.aspx

reporting help organisations to evaluate progress made, develop board-approved plans, and publicly report a summary of their position.

Further research to fully understand the best ways of developing climate resilience, supporting the development of sustainable cities and the impacts of a changing environment on health are being developed.

Current assessment across the health sector

Sector wide:

The health sector varies in its understanding and commitment to adapting to climate change. There is a system-wide governance process in place through the National Cross System Group and support is available for organisations to plan and take forward adaptation planning. The NHS contract[15] requires organisations to demonstrate progress made in this field and there are areas of excellent practice however this is not uniform and not systematic at any level.

National Organisations:

Only three of the health organisations with a national role have adaptation plans in place, although most are signatories to the Sustainable Development Strategy and recognise the need to do so.

NHS provider organisations:

Estates and facilities data highlights that 57% of NHS providers have a board-approved adaptation plan in place (either as part of their SDMP or as a standalone plan) and that 80% consider they are capable of coping with rising temperatures, flooding and other projected events that may disrupt 'normal' service. However findings from a recent SDMP survey suggest that only a third of providers have plans in place to address service delivery in the event of climate change (only a third state that their plans fit into local system planning structures).

Primary Care:

Of 50 General Practitioners (GPs) that responded to a nationwide Royal College of General Practitioners (RCGP) survey, less than half were confident that their practice had adaptation plans in place to remain resilient in adverse weather events. They were even less confident in relation to their local Clinical Commissioning Groups' (CCG) plans.

Commissioning Groups:

Based on the SDMP survey, 18% of CCGs feel that their board-approved plans address the need to adapt the delivery of their organisation's activities and organisation's infrastructure as a result of climate change and adverse weather.

Health and Wellbeing Boards:

Of 29 Health and Wellbeing Boards (HWB) that responded to a recent bespoke survey, over 60% reported that they have undertaken risk assessments in relation to climate change and extreme weather events and have local plans in place to address and monitor them.

[15]Section 15.5: http://www.england.nhs.uk/wp-content/uploads/2013/12/sec-b-cond-1415.pdf

The health sector is clearly at an early stage of development in relation to climate change adaptation. It recognises the need to prepare and respond to extreme weather events and that doing so sustainably will reap greater benefits for all. Some plans and mechanisms are in place however it is not yet systematic or fully integrated into local health systems or national roles.

Recommendations

The health sector is dealing with a high number of priorities and cost pressures which can make it difficult to prioritise action on climate change. However a number of actions can be taken to improve resilience and to reduce the likelihood of climate change which will also bring health benefits for individuals, communities and services. Many of these actions also bring financial savings so can be considered as multi-win measures. The health sector should seriously consider these actions.

There is a clear synergy between responding to emergencies under the Civil Contingencies Act 2004 (CCA)[16], preparing for extreme weather events and developing sustainable communities and services. In order to achieve a more joined up and cohesive approach this report recommends that further support is given to HWBs, Local Resilience Forums (LRFs) and Local Health Resilience Partnerships (LHRPs) to embed climate change into local thinking and decision making. This includes sharing information and plans in response to the CCA and CCAct, ensuring climate change is included in risk registers, HWB assessments and strategies as well as supporting local assurance mechanisms.

Whereas the full extent of the effects of climate change on the health of the national population is reasonably well-established, local climate change risks and the resilience of the health estate infrastructure are managed locally. Information on risks and actions are not reported or analysed centrally to provide a comprehensive picture of the risks or actions taken at national level. This report recommends that available data from locally developed plans is analysed to draw out nationwide risks and identify key areas that need extra support or action. It is worth monitoring staff and patient experience in relation to environmental changes for instance overheating on wards so that a baseline can be established and monitored over time. This report recommends that further consideration is given to how best to integrate this into existing mechanisms.

Conclusion

This report is a first health sector-wide report on adaptation to climate change and as such has been invaluable to understanding the level of preparedness that is in place and to building cross-system working including across public health and voluntary care. It forms a baseline against which future action can be monitored. The greatest benefits of writing this report lie in the way it is taken forward and developed further over time. As such an action plan to support the recommendations has been developed (and is currently included in the What Next? Section). This will feed into the National Cross System Group and NAP Steering Group for monitoring on a yearly basis.

[16] http://www.legislation.gov.uk/ukpga/2004/36/contents

A summary overview of this adaptation report content is included in the table below:

Vision					
A proactive approach to preparedness and resilience amongst people, communities and services which means the health sector can respond to extreme weather conditions and events.					
Risks	Plans	Impacts	Opportunities	Barriers	High level Recommendations
To population: Heat, cold and flood-related mortality and morbidity. Increase in vector borne diseases.	NAP obj 11 Heatwave Plan. Cold Weather Plan.	NCS Weather plan evaluations. National bodies and HWBB surveys.	Health benefits. Low regret actions.	Competing priorities. System fragmentation.	Support joined up working across organisations and local systems. Develop continuum from emergency responsiveness to longer term planning.
To services & infrastructure: Service pattern changes and business continuity	NAP obj 12 SD Strategy. SDMP. Health Building Notes.	NCS SDMP indicator. Good Corporate Citizen (GCC) sector surveys.	Cost savings. Systems approach.	Short termism. Finances.	Summary of local information into national intelligence. Monitor patient experience.
What Next?					
A full action plan is included in response to the recommendations and will be monitored by the National Cross System Group and the NAP Steering Group.					

Table 1.1 – A summary overview of this adaptation report content

PART I

Introduction

The health sector in England spends over £100 billion every year to provide services for a population of 55 million people. It is the first health sector globally to issue a collective commitment[17] to address climate change. This was supported by a joint statement from organisations across the sector issued to the UN Climate Summit in September 2014.

The National Cross System Group committed to supporting the implementation of the Sustainable Development Strategy for the NHS, Public Health and Social Care system, launched in January 2014. This includes reducing carbon emissions by 34% by 2020, embedding sustainability into decision making processes at all levels, supporting local leadership in attaining sustainable, resilient, healthy people and places and having regularly-updated extreme weather plans in place to deal with events such as heatwaves, flooding and cold.

> "We've now got a plan that we have committed to. It's about reducing our carbon footprint; it's about being better prepared for extreme events. And crucially, about how we invest, now, in what we're doing, and about how that's going to affect future generations"
>
> *Duncan Selbie (Chief Executive of Public Health England) addressing the UN on September 20th 2014, New York*

All health sector organisations have a real role to play in adapting to our changing climate. Actions will have an impact on people's health and wellbeing and the way services are delivered. The effects of climate change are expected to be unequally distributed, affecting deprived people and vulnerable groups the most. Efforts to reduce the harm and maximise the benefit of carbon mitigation also need to reduce these inequalities. The system needs to work collectively to consider carbon mitigation and adaptation together. The current financial climate encourages a short term view; however preparation for climate change now will pay dividends in the future. No individual health sector organisation can address the complex issues that climate change poses on their own, therefore the healthcare system needs to work collectively to consider carbon mitigation and adaptation and develop a coordinated approach.

The Adaptation Reporting Power (ARP) under the CCAct requires public sector organisations to report on their preparation and planning for climate change and adaptation. In the first round of the ARP (2011), Monitor[18] was the sole reporting body in the health sector reporting on their own organisation's perspective.

Under the second ARP, the health sector as a whole is considering the risks and impacts of climate change in order to manage them appropriately. This report aims to:

- Describe the current state of adaptation to climate change across the health sector

[17] http://www.sduhealth.org.uk/policy-strategy/engagement-resources/un-climate-summit.aspx
[18] https://www.gov.uk/government/publications/adaptation-reporting-power-received-reports

- identify risks, opportunities and barriers to action in adapting to climate change
- set out a vision of the progress the sector could make over the next five years and how this could be achieved
- produce recommendations needed to ensure the health sector is able to make progress as required.

This report takes a cross-system approach in order to provide greater insight into the state of climate change preparedness and the capacity to adapt in the sector. This also helps identify barriers and opportunities for further collaboration. The collation process acts as an opportunity to engage with the sector, raise awareness and highlight good practice.

The Sustainable Development Unit (SDU) acts as the formal reporting body to the Government for adaptation to climate change across the health sector. The SDU is supported by a National Cross System Group that provides leadership, vision, and cross-system support for sustainable development. The group forms a natural conduit for the ARP and further endorses a cross-system approach.

To co-ordinate the development and writing of the report the SDU, Department of Health (DH), NHS England and PHE formed a cross system working group with representation from the entire sector. This report is based on these joint collaborative efforts and grounded in some key principles outlined below.

1: **A pragmatic approach to the scope of the health and care system**

The health and care system is large and complex capturing many organisations operating in a variety of settings. The component parts are outlined in the DH diagram in Figure 1.2.[19] At a local level they range from local trusts, clinical commissioning groups (CCGs), pharmacies and local government while nationally there are a number of bodies such as NHS England and central government. In order to reflect the complexity and interdependencies the system can be seen in an even wider context, which could include participants ranging from individual home carers, transport companies, utilities and infrastructure, to drug and health care product manufacturers, building design and maintenance.

[19] Department of Health (2013) Guidance: the health and care system explained.

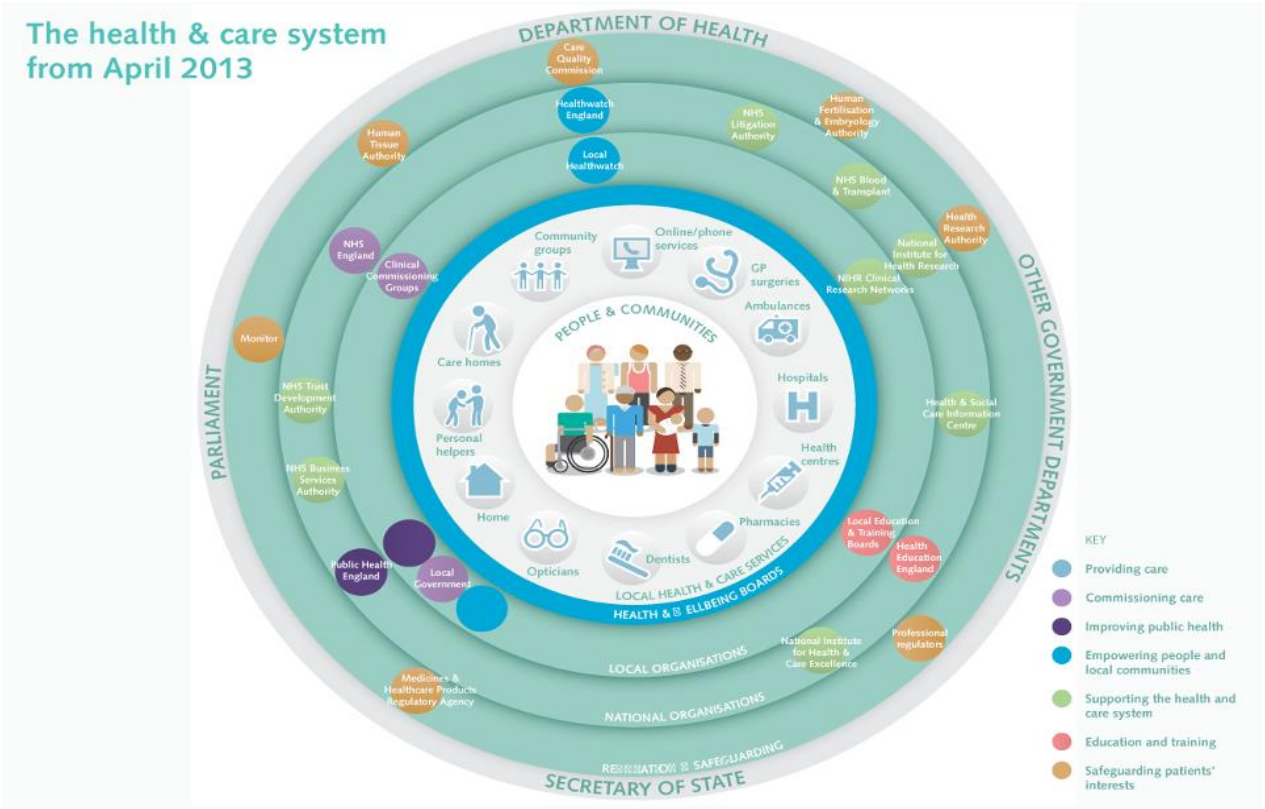

Figure 1.2 – An overview of the health and care system from April 2013

To capture all the actions and initiatives taken at all the levels of the system would be impractical. For the purposes of this report the pragmatic decision was taken to:

- consider key organisations or sectors of the system to construct a countrywide overview. This means that some areas are not considered in great detail. Although social care is inextricably linked to the health sector, it is deliberately not covered by this report because it would require more of a partnership approach with local authorities and should be considered in future reports
- take a broad view of actions taken
- note the interdependencies and complexity of the health and care system in its widest sense.

The following areas are used as a basis for the report sections in Part II of the report:

- national bodies that represent the health sector including DH, NHS England, PHE and NHS Property Services
- providers of NHS services representing circa 90% of healthcare provision in England
- commissioners (limited in this round to CCGs who represent 60%[20] of NHS commissioning across the health sector)
- Local Authority public health departments and HWBs
- primary care represented in this round by GPs and dental practitioners
- voluntary sector represented in this round by the National Council of Voluntary Organisations (NCVO) and with support from Joseph Rowntree Foundation (JRF).

[20] http://www.nhs.uk/NHSEngland/thenhs/about/Pages/nhsstructure.aspx

2: Key aspects considered for each part of the healthcare system

Based on Defra's requirements[21], three elements are considered for each part of the health system:

1 RISK: Assessing risks, identifying threats and opportunities highlighting an appreciation of the current and potential climate risks to operations and functions based on the current best evidence.

2 PLANS: Developing adaptation plans. The risk assessment should produce a priority list of risks for which a range of possible adaptation responses can be developed.

3 IMPACT: Implementing the adaptation plan, embedding adaptation into existing structures and monitoring the effects. Having prepared a programme of adaptation responses, the next step is taking actions, as well as on-going evaluation of their effectiveness in reducing the risk to the sector.

The report production process gathered the evidence and data to understand the extent to which these three elements are taking place in different parts of the system. Where possible the other areas in Defra's guidance are addressed including:

- opportunities
- assumptions and uncertainties
- barriers to implementation of adaptation plans
- useful tools, support and guidance – (summarised in Appendix 6)

A considerable amount of information is routinely collected by the health system and this report draws predominantly on these sources. In order to provide a more complete picture, short surveys or additional evidence were collected where necessary. These survey responses have been summarised within the report sections, and the full responses are available in the appendices. The report also highlights areas where key information is still needed.

3: **A clear report structure**

To ensure a system approach is given prominence and for ease of reading the report is divided into three parts.

Part one - An introductory overarching report on the health system as a whole.

Part two - Describes groups of organisations or areas of the health system with specific information or recommendations, using the headings as set out in Defra's guidance.

Part three - Is a collection of appendices containing further information on the sector, raw data collected from surveys for the report and tools and guidance where available.

[21] https://www.gov.uk/government/publications/adapting-to-climate-change-2013-strategy-for-exercising-the-adaptation-reporting-power

Background

This section summarises the context in which this report is written in relation to climate change predictions and the relevant legislation.

Climate Change Predictions

The Fifth Assessment report of the Intergovernmental Panel on Climate Change (IPCC)[22] presents the emerging and unequivocal scientific evidence of how climate change is impacting land, sea and air around the world. The highest levels of greenhouse gas emissions, which are the main drivers of climate change, are already being realised. For the UK average temperatures are already rising and heavy rainfall events are increasing in frequency and duration, challenging the UK economy, the NHS and public health infrastructure. The most recent and comprehensive UK climate analysis tool UK Climate Projections, 2009 (UKCP09) projected the UK will experience:

- an increased number of heavy rainfall events increasing flooding events in winter and decreased rainfall in summer
- drier UK summers with heatwaves and heightened air pollution.

The Climate Change Act 2008 (CCAct)[23] - internationally the first of its kind, is a legally binding long-term framework for the UK to build resilience and adapt to climate change under the Kyoto Protocol[24], as well as having powers to drive down Greenhouse Gas emissions. The CCAct requires a five yearly Climate Change Risk Assessment (CCRA) to understand the level of risk and opportunities for the UK arising from climate change and setting out the main priorities for adaptation. The first CCRA Evidence Report (2012) identified the top risks to the UK.

The Civil Contingencies Act 2004 **(CCA)[25]** - requires a National Risk Register (NRR) to be compiled to provide an assessment of the likelihood and potential impact of a range of risks, including natural hazards that may affect the UK. Of the top 17 non-malicious risks identified, many are events that are expected to be exacerbated by a changing climate, including coastal and inland flooding, storms and gales, heatwaves, drought and wildfires.

The evidence for climate change is clear and the UK government has responded by developing the CCAct to ensure that UK plc addresses these inevitable risks. The CCA helps ensures that national risks are taken into account. There is a clear linkage between the risks associated with climate change and those that emergency responders need to be prepared to respond to.

[22] http://www.climatechange2013.org/images/report/WG1AR5_ALL_FINAL.pdf
[23] http://www.legislation.gov.uk/ukpga/2008/27/contents
[24] http://unfccc.int/kyoto_protocol/items/2830.php
[25] http://www.legislation.gov.uk/ukpga/2004/36/contents

Assessment of climate change risks for the healthcare sector

This section summarises the risk assessments that relate to the health sector more specifically.

Risk Assessments

For over a decade the UK has been giving serious consideration to the risks climate change could pose to our health:

- in 2002, the DH commissioned the Health Protection Agency[26] to produce the Health Effects of Climate Change in the UK one of the first reports of its kind internationally. This report was updated in line with climate change projections in 2008 and 2012. The 2012 edition models the risks and opportunities to health of current climate projections with a regional focus including the potential adverse effects to hospitals, health centres and care homes.
- The CCRA was undertaken to identify the range of climate risks within each sector including a report on the health sector[27]. The CCRA used projections (UKCP09) for three 30-year periods centred on the 2020s, 2050s and 2080s[28].

Key risks to the health and care sector

The vulnerabilities across the health system can be split into two main headings:

1. Risks to the population
2. Risks to services

Risks to the population

The predicted health effects by the middle of the century include:

1a. increased risks of summer morbidity and mortality. Some studies predict heat-related deaths in summer could increase substantially by the 2050's. Those most at risk include older people and those suffering from illnesses that compromise thermoregulation, mobility, awareness and behaviour. However, cold related death will remain the largest weather-related risk to health in the future due to an aging population[29]

1b. summer air pollution (ground level ozone; pollen counts). Ground level ozone is an air pollutant and greenhouse gas, which is likely to increase as temperatures rise. Pollen seasons may get longer and pollens more potent as invasive plant species become more common in the UK. This is likely to impact on respiratory conditions [30]

[26] Now integrated into Public Health England
[27] http://randd.defra.gov.uk/Default.aspx?Module=More&Location=None&ProjectID=15747
[28] The medium emissions scenario was used for the 2020s and the low, medium and high emission scenarios for the 2050s and 2080s
[29] Adaptation Sub-Committee (2014) Managing climate risks to well-being and the economy: Progress report 2014
[30] Ziello, C., et al. (2012). Changes to airborne pollen counts across Europe. *PLoS One*, *7*(4), e34076.

1c. deaths, injuries and mental health effects as a result of flooding. Around five million properties in England including public sector buildings are at some risk of flooding from rivers, the sea or surface water[31]. By 2050, major coastal floods could become more than twice as frequent[32].

1d. water, vector and food borne diseases. Infections from outside the country could reach the UK. With rising temperatures there will be an increased need for good temperature controlled food storage, if food spoils there is an increased risk of gastrointestinal disease[33].

1e. skin cancer through increased ground level UV exposure. Solar radiation levels across England have increased since 1990. Higher radiation levels may increase the incidence of melanoma skin cancer, however the relationship between environmental conditions and future incidence of skin cancer is a complex issue predominantly driven by behavioural changes[34].

Risks to services

The anticipated increase in frequency and intensity of severe weather will result in extra demands on the health system. The risk to services is twofold:

a. a change in service patterns because of the risks to the health of the population
b. risks to the infrastructure of services.

2a. Service patterns

The risk to service patterns is primarily linked to an increase in demand for services because of the changing health needs of the population that climate change will bring. These are wide ranging and have not been quantified across the UK because there are a number of variables to be taken into account, however these changes will need to be factored in. In addition new disease threats such as higher malaria prevalence across Europe may cause an increase in pharmaceutical use and needs to be considered, especially for supply chains.

Changes in health needs directly related to extreme weather events include profound effects on people's mental health and well-being following flooding that may continue over extended periods of time[35].

Risks may include hot weather affecting care homes which could put increasing pressures on beds in hospitals. Similarly, evacuation of care homes due to flooding may have knock-on pressures to hospital or community services.

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[31] Environment Agency (2009) Flooding in England: A National Assessment of Flood Risk

[32] Adaptation Sub-Committee (2014) Managing climate risks to well-being and the economy: Progress report 2014

[33] HECC (2012), chapter 9

[34] Hames, D. and Vardoulakis, S (2012) Health Sector Report. Climate Change Risk Assessment for the Health Sector. UK 2012 Climate Change Risk Assessment

[35] Stanke C, Murray V, Amlôt R, Nurse J, Williams R. (2012) The effects of flooding on mental health: Outcomes and recommendations from a review of the literature. PLoS Currents Disasters. DOI: 10.1371/4f9f1fa9c3cae. Available at: http://currents.plos.org/disasters/article/the-effects-of-flooding-on-mental-health-outcomes-and-recommendations-from-a-review-of-the-literature/

Potential problems during heatwaves could include technological devices overheating compromising access and patient care, possible reduction in the efficacy of medication due to overheating, potential exacerbation of existing illness of patients and poor staff performance if indoor workplace temperatures are not controlled.
Climate related health burdens may be affected by changes in the size and geographical distribution of vulnerable population groups (e.g. elderly populations). This is also likely to be influenced by migration induced by climate change[36].

2b. Healthcare Infrastructure

Studies have shown it is unlikely that existing NHS infrastructure is sufficiently resilient to extreme weather events.
Work carried out by the Environment Agency for the Adaptation Sub Committee (ASC) highlights that between 10 – 14% of emergency service stations and 6 - 8% of hospitals, care homes and surgeries are susceptible to river and coastal flooding.
Recent modelling to predict future internal hospital temperatures has suggested that lightweight modular buildings may overheat significantly compared to historic Nightingale[37] and traditional masonry buildings[38]. Indeed many wards are already overheating during hot summers although the extent to which this occurs on a yearly basis is not currently recorded in a systematic way. It is suggested that passive external shading would not cool these wards sufficiently and that portable air conditioning would be required. Further research on the number of hospitals and the level of overheating already present and predictable into the future is needed to ascertain the full extent of the risk over time periods.

Given experience in other sectors, and based on the ASC report, additional risks are likely to include:

- disruption to IT communications and power networks are likely to affect service delivery
- business continuity within the health and care sector may be affected by extreme weather for instance:
    - staff may be unable to access their place of work or be directly affected by an event such as flooding
    - hospitals not previously at risk may enter flood risk zones which in turn may cause complications of moving patients elsewhere, diverting emergency response vehicles and affecting hospital infrastructure [39]
    - other wider environmental changes such as food security and drought will have an effect on health and care services[40]
- cost pressures and supply disruption of goods and services e.g. resource shortages and extreme events abroad.

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[36] Health Protection Agency (2010) International Dimensions of Climate Change. The Implications for the UK's Health Sector of the International Dimensions of Climate Change, 2010 to 2100
[37] http://www.kingscollections.org/exhibitions/specialcollections/nightingale-and-hospital-design/florence-nightingale-and-hospital-design
[38] Iddon et al (2015) The influence of hospital ward design on resilience to heat waves: An exploration using distributed lag models. *Energy and Buildings* 86 (2015) 573–588
[39] Hames, D. and Vardoulakis, S (2012) Health Sector Report. Climate Change Risk Assessment for the Health Sector. UK 2012 Climate Change Risk Assessment
[40] Redshaw et al (2013) "*Potential Changes in Disease Patterns and Pharmaceutical Use in Response to Climate Change*" Journal of Toxicology and Environmental Health 16: 285-370

These risks are likely to be included in local risk assessments however they have not been collated and analysed at a nationwide scale.

Summary table of risks

The table below summarises the risks for the health sector both to population health and to service patterns and infrastructure. This summary is used to ensure that planning and monitoring of measures are addressing all elements required.

Climate related risks	Risks to the population	Risks to services	
		Service patterns	Infrastructure
Warmer summers and increased frequency and intensity of heat waves	Heat-related morbidity and mortality	Increase in heat related consultations, emergency department attendances and admissions	Overheating of buildings, and impact on infrastructure, supplies
Warmer summers	Summer air pollution	Increase in respiratory conditions and related attendances/admissions	N/A
Warmer summers	Skin cancer due to UV exposure	Possible increase in demand over time	N/A
Flooding	Deaths, injuries and mental health effects as a result of flooding	Increased mental health support needs	9.5% of buildings liable to flooding. Transport routes liable to flooding and resulting risks to business continuity
Cold weather events (although overall winters may be warmer)	Increased morbidity and mortality for vulnerable and elderly people	Increase in flu and cold related consultations and admissions	Transport route liable to icy and snowy conditions and impact on accessibility
Bio impacts	Increase in water, vector and food borne diseases	Increase in monitoring of and related diseases	Medical supply chains
Social impacts of climate change	Potential risks associated with changes in migration, vulnerable populations, infrastructure	Demographics Vulnerable populations Migration changes Cost increases to services	N/A

Table 1.3 – Summary table of climate related risks to the population and to healthcare services

Planning

This section summarises the plans that ensure preparedness to climate change adaptation across the sector at national and at local level. Preparedness and the ability to respond to emergency scenarios are considered under two main strands:

1. Climate Change Planning linked to the Climate Change Act 2008
2. Civil Contingencies Preparedness linked to the Civil Contingencies Act 2004

These strands overlap when considering responses to extreme weather events and need to be mutually supportive so that there is a link running between risk assessment, preparedness, responsiveness and planning for longer term changes.

Climate Change Planning

The healthcare system plans for the risks and opportunities of a changing climate by:

- using evidence-based scientific research and undertaking research to address evidence gaps
- adopting the objectives and commitments from the NAP
- addressing the recommendations from the ASC
- assessing risks and developing plans at local and at organisational level.

National Planning

The ASC of the Committee on Climate Change (CCC) provides external assurance and advice to the government and devolved administrations on the UK's planning and preparedness to the major risks and opportunities from climate change. The ASC published '*Managing climate risks to well-being and the economy'* which describes their assessment of how the health and social care system is assessing the risks and impacts of climate change and whether it is managing them appropriately.

The National Adaptation Programme 2013 (NAP)[41], as required by the CCAct, sets out objectives, policies and proposals to address the risks identified in the CCRA, so that government, business and society can be more 'climate-ready'. Chapter four of the NAP focuses on healthy and resilient communities, with objectives to protect public health and increase resilience of the health system.

[41] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/209866/pb13942-nap-20130701.pdf

Vision	Focus area	Objectives	
A health service, a public health and social care system which are resilient and adapted to climate change	1: Climate resilience in the health and social care system	11	To reduce the risk of death and illness associated with severe weather events and climate change and increase preparedness and resilience to the impacts on public health.
		12	To promote climate resilience within the NHS, public health and social care system to ensure continuity of services and resilient assets/ estates including the ability to deal with the increased demand for services associated with severe weather related events.

Table 1.4 – The vision and objectives of the health system component of the NAP

These two objectives relate very closely to both core risks described earlier in relation to the public's health and to the risk to services. They help form the basis for health sector planning in response to climate change risks. A NAP health and care system wide steering group is convened by DH to ensure consistent and coherent policy at national level to support local adaptation planning. The steering group also plays a role in supporting specific projects to provide tools and guidance that enable adaptation planning by health and care organisations.

To support the NAP cross system plans have been developed to address the risks from heatwaves, cold weather and flooding and to promote community resilience. The Heatwave plan for England and the Cold Weather Plan for England recommend actions that decision-makers, frontline staff, voluntary and community sector workers and individuals can take year round in response to heatwaves and cold weather to protect health. Annual seminars are held to promote and evaluate the plans.

National Planning Practice Guidance (2014) considers planning adaptation for coastal change and flooding. Resilience planning for the healthcare estate (HBN 00-07) [and 'Supplement A: resilience and emergency planning in primary and community care' (HBN 11-01)][42] provides a best practice approach to resilience and risks, including climate change, using a whole system approach to the healthcare estate and incorporating considerations into design, planning, procurement and use. The health sector recognises that sustainable resilient and healthy communities can support preparedness to climate change whilst also addressing environmental and social sustainability. The health sector is tackling these issues in a collaborative manner.

The Sustainable Development Strategy for the NHS, Public Health and Social Care System 2014-2020 describes the vision for a sustainable health and care system by reducing carbon emissions, protecting natural resources, preparing communities for extreme weather events and promoting

[42] HBN 00-07 https://www.gov.uk/government/publications/resilience-planning-for-nhs-facilities and HBN 11-01 https://www.gov.uk/government/publications/guidance-for-facilities-for-providing-primary-and-community-care-services

healthy lifestyles and environments. One of its three goals is that "Communities and services are ready and resilient for changing times and climates". A module of the strategy focuses on 'Healthy Sustainable and Resilient Communities' which highlights the need for multi-agency planning and organisational collaboration to provide a better all-round solution.

The National Cross System Group on sustainable development supports the implementation of the strategy and related modules, and ensures that all organisations are considering their role to support the development of sustainable and prosperous places, communities and people.
The National Institute of Health and Care Excellence (NICE) have also developed guidelines in relation to Health and healthcare infrastructure planning, National Air Quality Strategy and a Local Air Quality Management framework support healthy communities in the provision and utilisation of green space for reducing flooding risk and increasing physical activity.

Local and organisational planning

Sustainable Development Management Plans (SDMP)
The plans assist organisations in understanding, planning and monitoring sustainable development objectives. Within their SDMPs, organisations are encouraged to include adaptation to climate change. Having a board approved SDMP is a requirement of the NHS Standard Contract under the Carbon Reduction Strategy and has been supplemented from 2012 with a Public Health Outcomes Framework (PHOF) indicator (3.06) under Health Protection. Organisational plans should be based on the UKCP09 and draw on relevant national and local evidence.

Strategic Health Asset Planning and Evaluation (SHAPE)
The Strategic Health Asset Planning and Evaluation (SHAPE) tool is a web-enabled application which aims to increase climate change resilience within health and social care. It informs and supports the strategic planning of services and physical assets across the whole health and social care system. SHAPE links clinical analyses, public health, primary care and demographic data with healthcare estates performance and facilities location. The application includes geographic information system (GIS) mapping and supports travel time analysis. Current developments include mapping flood risk zone areas and the identification of vulnerable populations and key assets. As part of PHE's contribution to the NAP, SHAPE is being used in the development of flood exposure modelling to improve planning, increase preparedness, and emergency response management across health and social care. This will aid the development of more flood-resilient healthcare facilities and potentially reduce the health impacts of flooding.

Civil Contingencies preparedness

Categorising responders[43]

The CCA divides local responders to emergencies into categories 1 and Category 2 responders. Those organisations in Category 1 at the core of the response to most emergencies (the emergency services, local authorities, NHS bodies). They are subject to the full set of civil protection duties set out in the Act. Their requirements include assessing the risk of emergencies occurring using this to inform contingency planning, putting in place emergency and business continuity management plans, as well as sharing information with other local responders to enhance co-ordination. Category 2 responders include organisations such as Clinical Commissioning Groups (CCGs), the Health and Safety Executive (HSE), transport and utility companies as 'co-operating bodies'. They are less likely to be involved in the heart of planning work, but will be heavily involved in incidents that affect their own sector. They have a lesser set of duties - co-operating and sharing relevant information with other Category 1 and 2 responders.
They are critical players in emergency preparedness, resilience and response and work closely with other category 1 and category 2 responders.

There is statutory responsibility for many organisations to plan for, and respond to, a wide range of incidents and emergencies that could affect public health or patient care. These could be anything from extreme weather conditions to an outbreak of an infectious disease or a major transport accident. The Civil Contingencies Act (2004) requires NHS organisations and local authorities, amongst others, to show that they can deal with such incidents while maintaining services. This programme of work is referred to in the health community as emergency preparedness, resilience and response (EPRR)[44].

Local Resilience Forums (LRF)[45] including Local Health Resilience Partnerships (LHRP)

LRFs have been developed to ensure effective delivery of those duties under the CCA that need to be developed in a multi-agency environment. In particular the LRF process should deliver:

- the compilation of agreed risk profiles for the area, through a Community Risk Register;
- an approach to encourage Category 1 responders to address all aspects of policy in relation to risk planning, business continuity management and publication of information. Communication with the public and other aspects of civil protection duty, including the promotion of business continuity management by local authorities, and
- support the preparation of multi-agency planning and co-ordination of multi-agency exercises and other training events .

[43] https://www.gov.uk/preparation-and-planning-for-emergencies-responsibilities-of-responder-agencies-and-others
[44] http://www.england.nhs.uk/ourwork/eprr/
[45] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/62277/The_role_of_Local_Resilience_Forums-_A_reference_document_v2_July_2013.pdf

Impact/Evaluation

This section highlights the main evidence available about the measurement, monitoring and the level of adaptation planning that is taking place across the health care sector. Part ll of the report provides further and more specific evidence for particular parts of the system.

Monitoring information

There are a number of indicators that relate to climate change and adaptation across the sector however very few indicators currently measure the impact of adaptive measures. PHE with the support of HR Wallingford have assessed indicators in health and emergency planning[46] under four sub themes: overheating, emergency planning, social equity and other climate-related risks to health[47].

The existing sources of information that enable some monitoring of the potential health effects from a changing climate include:

Risks to population monitoring:

- population health surveillance information which includes Syndromic surveillance (a warning system of the spread of illness) and mortality monitoring year-round
- winter health indicators monitored on a weekly basis from November to April and summary reports following heatwave events
- robust systems of laboratory diagnosis, surveillance, outbreak detection and response, investigation of sporadic disease epidemiology and public health action to detect, control and prevent infections
- solar radiation data from nine UK measurement sites is available to the public and two portable units can be deployed to outdoor events involving large crowds
- ad hoc enhanced health impact surveillance in response to specific events such as floods and air pollution episodes (e.g. GP consultations and ambulance response times)
- the PHOF sets out a number of indicators used locally and nationally to monitor progress towards improving the population's health. Some of the indicators relate directly or indirectly to adaptation and are included in Appendix 2.

Level of adaptation planning across the system

Organisational reporting

NHS trusts are required by the NHS standard contract to report on sustainability within their annual report with the aim of integrating sustainable development by embedding it into management and government processes as levers and drivers for change. The SDU has collated an annual SDMP

[46] http://www.theccc.org.uk/publication/managing-climate-risks-to-well-being-and-the-economy-asc-progress-report-2014/

[47] http://www.theccc.org.uk/wp-content/uploads/2014/07/4-2014-03-31-health-and-emergency-planning-indicators-final.pdf

survey for completion by NHS providers and CCGs. This will now be integrated into Estates Return Information Collection (ERIC) data collection mechanisms.

Summary of findings from the health sector

This report bases its findings on existing data where available. In order to provide a better understanding of the state of the sector in relation to adaptation planning, some bespoke surveys were developed to supplement existing information. This section provides a summary of the findings. More detail is included in Part II and the data is included in the appendices in Part III.

National Bodies

Most national bodies responded to a DH survey that was sent out to support this report. Half have a sustainability plan in place though only three out of the eight responders have adaptation plans in place, with two of these agreeing that risk assessments are carried out, and one agreeing that the impact of their plans are measured. It is clear that although most organisations with a national role have committed to being more environmentally sustainable, they are still developing their roles as leaders around sustainable development and climate change.

Health organisations

The National Capabilities Survey (NCS)[48] is a voluntary survey conducted every two years to assess the UK's preparedness for the risks set out in the National Risk Register (NRR). It is a key element in the cross-government assurance process for emergency preparedness and response and it covers many organisations in the health system. Extracts from the 2014 survey highlighted that most NHS organisations have confidence in their business continuity plans and that nearly three quarters have undertaken some level of risk assessment in relation to their critical activities including their dependency on external factors. It is not certain that all climate change risks are included amongst the risks considered. The plans developed however do have a bearing on how the sector might respond to extreme weather events.

NHS England local teams and PHE support community resilience in collaboration with their LRFs. The emergencies they consider to be most prepared for are heatwaves, flooding, cold weather, ice and snow incidents and pandemic flu.

Providers

Estates and Facilities data for NHS provider organisations highlights that 57% have a board approved adaptation plan in place and that 80% consider they are capable of coping with rising temperatures, flooding and other projected events that may disrupt 'normal' service.

Findings from the SDMP survey suggest that only a third of providers have plans in place to address service delivery in the event of climate change. And a third state that their plans fit into local system planning structures. Ambulance service providers in England share a Climate Change Adaptation Plan.

There is currently no method of assessing the impact of these plans.

[48] https://www.gov.uk/preparation-and-planning-for-emergencies-the-capabilities-programme

Health and Wellbeing Boards

It is difficult to assess the work HWBs and local authority public health departments are undertaking specifically in relation to adaptation as it may go unrecognised or be included in other areas of work, and there are no specific measures of activity. Of 29 HWBs that responded to a recent SDU and Environment Agency survey, over 60% reported that they have undertaken risk assessments in relation to climate change and extreme weather events and have local plans in place to address and monitor them.

Primary Care

Of 50 GPs that responded to a nationwide survey carried out by the RCGP, less than half were confident that their practice had adaptation plans in place to remain resilient in adverse weather events. They were even less confident in relation to their local commissioners' plans.

A specific dentistry survey highlighted that the majority of public health dentistry consultants were not confident that the risks to providing dental care from a changing climate and adverse weather events were assessed.

Voluntary Sector

The NCVO survey indicates that awareness of the consequences of a changing climate is still low among Voluntary and Community sector Organisations (VCO) (that are non-environmental) at the moment, with only a third of responding organisations having undertaken risk assessments.

These results across the health sector give some confidence that the sector is assessing risks, developing plans and exercising their responsiveness for risks identified in the national risk register. However the sector is still at an early stage of development in relation to climate change adaptation planning. It recognises the need to prepare and respond to extreme weather events and that doing so sustainably will reap greater benefits for all. Some plans and mechanisms are in place however it is not yet systematic nor fully integrated into local health system planning and the quality of the planning is unknown.

Existing evaluation of the impact of specific measures

The ASC report stated that the heatwave plan awareness is high at managerial level but it is unknown if actions are being implemented at the operational levels. A number of heat wave evaluation mechanisms are in place:

- In 2015 PHE are planning to publish an evaluation report of the impacts and response to the heatwave in 2013
- PHE and DH are exploring mechanisms to ensure a local level heatwave evaluation is undertaken
- The Environmental Change and Health Protection Research Units (HPRU) are undertaking an outcome evaluation plan of the Heatwave Plan for England by assessing population changes in the temperature-mortality risk profile in the years since the intervention was introduced.

An evaluation of the Cold Weather Plan for England has been conducted by the London School of Hygiene & Tropical Medicine.

Outputs of the three-year project (2011-2014) Public Health Adaptation Strategies to Extreme Weather Events (PHASE) include a user evaluation of flood health advice materials[49] which has been used to continue to develop and improve these materials.

These sources are useful to provide a more detailed picture of particular climate change adaptation measures however still need to be integrated into a broader picture to ascertain the progress being made.

Case Studies

The health sector can boast a wide range of interventions that relate to climate change adaptation with some excellent case exemplars in different areas. These are not collated systematically, however they could be utilised to further develop implementation plans at local level. Those collated as part of this report writing process are included for ease of reference in Appendix 5.

Research

There is clearly a need for further research to complement our current understanding. This section summarises the current and planned research likely to have an impact on future policy and planning in relation to climate change adaptation.

Health Protection Research Units (HPRU)

In partnership with PHE, the London School of Hygiene & Tropical Medicine is leading a National Institute for Health Research Health Protection Research Unit (NIHR HPRU) in Environmental Change and Health. PHE is also collaborating with the University of Exeter, University College London and the Met Office as part of the HPRU. This works looks at a number of areas:

- climate resilience - the prevention of adverse health effects of extreme weather. The evidence gathered will aim to support decision makers to ensure that the health of the UK population is not adversely affected by climate change
- healthy sustainable cities - a number of research projects to address how the built environment affects health, building overheating and urban heat islands, and considering the health benefits of sustainable housing and urban planning
- Public Health and the Natural Environment - health effects of green spaces, airborne aeroallergens such as pollen, and the ecology of infectious diseases (e.g. *campylobacter*) and disease vectors (ticks and mosquitos) in a changing environment.

[49] Findings of a study of the usefulness of HPA/PHE Flood Factsheets; Evaluation of the joint PHE/EA flooding leaflet following the winter floods of 2013/14

The Environmental Change and Health HPRU is also undertaking flood exposure modelling research exploring evacuation scenarios in collaboration with the Health and Safety Laboratory and others. A PHE cohort study on the mental health effects of flooding was launched in January 2015 to inform the delivery of services to areas affected by flooding in future and reduce the impact of flooding on people's health.

The Emergency Response and Preparedness HPRU is undertaking a number of projects to better understand the likely reactions, information needs and appropriate communication strategies for groups who may be particularly vulnerable during an emergency, focusing on the needs of an ageing population.

Other research

The Design and Delivery of Robust Hospital Environments in a Changing Climate (DeDeRHECC) is researching strategies for the adaptation of the NHS retained estate to increase its resilience to climate change. The current and projected resilience of the NHS estate is being evaluated using an indoor environment adaptive comfort model (BSEN 1521) and refurbishment strategies are being devised alongside the consideration of implementation barriers[50 51 52].

Sustainable Development Strategy – Innovation, technology and R&D module

The module that accompanies the Sustainable Development Strategy summarises the key research themes in implementing a more sustainable health and care sector. It identifies the areas for necessary research and how this links to progress that can be delivered through innovation and technology.

Challenges of translating knowledge into action

Whilst we have a great deal of knowledge about how a particular exposure or treatment can affect health we have less understanding about how to ensure this knowledge is translated into policy and practice. This area of work is less amenable to experimental research (e.g. randomised controlled trials) but a lack of this standard of evidence (often more applicable to clinical trials) can be a barrier to act.

[50] Lomas, K. J., & Giridharan, R. (2012). Thermal comfort standards, measured internal temperatures and thermal resilience to climate change of free-running buildings: a case-study of hospital wards. *Building and Environment*, *55*, 57-72

[51] Lomas, K. J., Giridharan, R., Short, C. A., & Fair, A. J. (2012). Resilience of 'Nightingale' hospital wards in a changing climate. *Building Services Engineering Research and Technology*, 0143624411432012

[52] Giridharan, R., Lomas, K. J., Short, C. A., & Fair, A. J. (2013). Performance of hospital spaces in summer: A case study of a 'Nucleus'-type hospital in the UK Midlands. *Energy and Buildings*, *66*, 315-328

Health Sector opportunities

Climate change and the way in which the health sector chooses to respond

This section summarises the opportunities that are likely to arise through climate change, actions to mitigate against it and the process of adapting to its impacts.

Health benefits of climate change action

Many of the climate change adaptation and mitigation actions are expected to have benefits on public health. For example:

- active travel can promote physical activity, reduce carbon emissions and improve air quality, thereby improving physical and mental health
- home energy efficiency can reduce carbon emissions and lead to warmer homes and less fuel poverty, thereby improving physical and mental health
- green spaces can help improve air quality, reduce urban heat islands and aid flood water absorption; and improve mental wellbeing, social cohesion and activity levels.

These are often termed low regret approaches because they bring benefits on a number of fronts with no negative impacts. Appropriate strategic planning can maximise these over time for instance by:

- supporting communities and local facilities to enhance their own self sufficiency and resilience
- implementation of low technological measures wherever possible for example by ensuring passive cooling is considered before air conditioning (which is high in energy use)
- water and resource conservation measures are in place as normal measure not just in times of drought.

Cost-savings

There are a number of cost savings that can be identified through actions to mitigate and adapt to climate change for instance:

- actions that reduce carbon and keep people healthy so keeping them out of hospital and independent
- estates management that uses energy efficiently and effectively, and ensures resilience to extreme weather. For instance proper ventilation in buildings can help to reduce the spread of illnesses[53] whilst at the same time reducing carbon emissions and providing the cooling necessary for hotter summers
- use of new technologies to reduce staff and patient travel, patient held notes to improve resilience, autonomy and satisfaction.

In addition there are cost savings to individuals and communities for instance through improved home energy efficiency, active travel and employment opportunities of a green economy.

[53] Airborne transmission of disease in hospitals, Eames I, Tang JW, Li Y, Wilson P. 2009.

Systems approach

There is an opportunity to transform services so they are not only able to respond to climate change but take an active role in developing preparedness, resilience and wellbeing of communities. Connections between the health sector, local authorities and the voluntary sector are the most effective mechanism of preparing and responding to scenarios but will also bring added value in relation to the current delivery of services and health. A systematic approach can support vulnerable people, enhance the development of health and well-being strategies and integrated commissioning and support actions to address the wider determinants of health such as housing, spatial planning, environmental services, education, and economic growth. The Five Year Forward View[54] describes this and highlights how crucial it is for all organisations to be more integrated in the planning, commissioning and delivery of services.

Warmer winters

Cold related deaths may reduce slightly from 41,000 per year presently to 40,000 in 2050[55]. Climate change means the frequency and intensity of cold snaps and snowfalls are likely to decline, but gains in reduced morbidity and mortality are likely to be largely offset by an ageing population. Furthermore, episodes of very cold weather will still occur. This may reduce winter pressures for emergency and acute health services but a population that is ageing and less prepared for very cold weather, as it becomes rarer, will mean cold remains the biggest weather-related risk to health[56].

Assumptions and uncertainties

This section summarises some of the main assumptions and uncertainties that are likely to influence the findings of the report.

Assumptions

Climate change

The main assumption this report is making is that climate change is inevitable and as such every country and organisation needs to prepare and plan accordingly. Furthermore every sector needs to prepare and plan in relation to their own core business activities whilst understanding the interdependencies that are critical to maintaining business continuity.

UKCP09

The report also makes the assumption that UKCP09 are the most reliable source of projections and are therefore used to underpin it.

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[54] http://www.england.nhs.uk/wp-content/uploads/2014/10/5yfv-web.pdf

[55] Adaptation Sub-Committee (2014) Managing climate risks to well-being and the economy: Progress report 2014

[56] Hajat, S., Vardoulakis, S., Heaviside, C., & Eggen, B. (2014). Climate change effects on human health: projections of temperature-related mortality for the UK during the 2020s, 2050s and 2080s. Journal of epidemiology and community health, jech-2013

Uncertainties

Political context and potential future re-structuring of the system

The health and care system is regularly affected by changes to government priorities with regular re-organisations and re-structuring. Maintaining key programmes of work across the system during periods of transition requires extra effort and goodwill from all organisations and their leaders. It is necessary to ensure that sustainable development progress is tied in with system wide transformations and re-evaluated on a regular basis.

Demographic change

Modelling future physical climate impacts on human populations is complicated by changes in population demographics. Climate related health burdens in the future may be affected by changes in the size and geographical distribution of vulnerable population groups. An ageing population alongside increased fertility and potential migration into the UK[57] will place a greater burden on health service infrastructure and emergency responders who will need to cope with the increasing intensity and frequency of severe weather associated with climate change predictions.

Social change

Social changes will have an impact on the approach that needs to be taken in responding to climate change. For instance the changes that are likely to be brought about through rapidly evolving technologies in relation to social media could bring about changes in societal and individual behaviour patterns that are not fully understood. These will have an impact on the way people understand health issues, access services and to the way people relate to climate change.

Barriers

This section highlights the main barriers that the health sector encompasses in adapting to climate change.

Competing priorities

Action to mitigate and adapt to climate change can be perceived as an 'environmental' issue, a consideration rather than an essential issue and seen as a future problem. There is sometimes insufficient understanding that positive actions to tackle climate change also have positive health outcomes (e.g. active travel, home energy efficiency, green spaces), thus improving wellbeing and reducing pressures on the current health system. Sustainable development and climate change resilience should be seen as a cross-cutting issue from the top to the bottom of the system, much in the same ways as the approach to health inequalities. This impacts on all aspects of the health sector including staff training, measurement and monitoring of changes and progress as well as financial decision making processes.

[57] Office for National Statistics (2014). National Population Predictions, 2012 based projections release

Short-termism

Health is under significant pressure to manage current issues and can find it hard to address concepts and risks perceived to lie mostly in the future. A focus on the near-term and discounting costs and benefits that accrue in the future is a long-recognised challenge for longer term projects when even planning is restricted to the next five years. Many responses too easily become reactive rather than proactive.

Finances

Alongside others the health sector is being challenged to consider its financial sustainability and in comparison the risk of climate change may seem less important. These financial pressures create a context in which investment in reducing future health burden can be postponed to save money today. It is often not fully understood that addressing mitigation and adaption to climate change can actually reduce financial pressures.

System fragmentation

The health system stretches across many different organisations and disciplines with varying cultures, pressures, approaches and budgets. Whilst all have the same aim of improving wellbeing, the differences in the detail of day-to- day operations can make working together challenging for instance in relation to data sharing or integrated commissioning. The emphasis on local decision-making brings a better understanding of local needs and assets, however this can mean that joined up approaches across organisational boundaries can be harder to deliver.

Vision

Through this reporting process, the health sector has further developed its vision in relation to climate change.

Health sector vision:

The health sector responds to extreme weather conditions and events and supports preparedness and resilience amongst people, communities and services. A proactive approach to resilience benefits the health sector over and above the ability to respond to crises by supporting communities and people to be healthier and more sustainable. Proactive and effective responses to extreme weather are in place whilst also planning for longer term solutions. The health sector commits to putting in place a balanced approach that will maximise safety now and plan for the longer term health of communities.

February 2015

Recommendations

The health sector has recognised that the only way to manage the effects of climate change and to reduce its impact is to work collaboratively. It has developed a strategy to help pull these efforts together and ensure that there are synergies in the approach. This report helps build a joined up approach across the health sector.
The recommendations below are proposed for the sector as a whole to support action over the next three to four years and are outlined in relation to the risks identified. Further recommendations by sections of the health sector are included under each chapter of Part ll of the report.

Recommendations

Addressing the risks of climate change to the health of the population

1. Encourage and support HWBs, LRFs and LHRPs to work together across the local system (with commissioning groups and primary care) to embed climate change in local thinking and decision making. This includes:

- developing the link between risk assessment, preparedness and responsiveness to emergencies, and longer term planning so that the requirements of the civil contingencies and climate change acts are mutually supportive
- ensuring that vulnerable people are particularly taken into account as part of these processes and that every effort is taken to reduce health inequalities
- the inclusion of extreme weather events and longer term climate change issues in risk registers
- the inclusion of sustainable development, climate change adaptation and mitigation measures in Joint Strategic Needs Assessments and Health and Wellbeing Strategies
- supporting local assurance mechanisms to include preparedness and adaptation plans in their processes.

2. Consider the best approach to support local decision-makers by summarising local intelligence and processes (e.g. from PAM and LRFs) to build a bigger picture nationally and in turn support local planning through tools, guidance and national information sets.

3. Improve the coordination and communication of risks and opportunities so they are aligned with public health concerns, the NHS Five Year Forward View, support local processes, and to highlight the case for change.

Addressing the risks to health services including building and infrastructure

It is clear that a considerable amount of risk assessment has been carried out within health organisations to identify more localised risks. Supplementing existing actions by collating national information/intelligence from local risk assessment and planning could support local delivery by providing a sound platform of information and enable forward planning to further enhance local approaches.

1. Consider approaches to develop a national detailed overview of the risks to buildings and infrastructure from projected impacts of climate change and how these are being assessed and managed.

2. Consider best approach to monitor patient and staff experience in relation to environmental changes in health settings e.g. develop patient survey questions to support understanding of overheating in hospitals.

3. Support further development of health estates information to include information on events and clinical incidents related to extreme weather and flooding, and consider best measures to monitor progress in resilience to these e.g. uptake of cooling measures, availability of cool rooms.

4. Develop indicators so the system can measure effectiveness and efficiency of adaptation plans.

5. Future ARP reports should include social care and more information on role of small providers and community and voluntary sector.

Conclusion

This is the first health sector wide report of its kind and as such has been an invaluable exercise to determine the position across the sector, raise awareness and set a baseline for the future. It highlights the considerable level of work carried out and helps ascertain the requirements to take the next steps forward.

Building a picture of the health sector whilst considering the perspective of every organisation and work strand has been a major challenge in the production of this report. There is a danger that works strands are too isolated in their remit and that the work relevant to adaptation does not get brought together sufficiently into a jointly owned approach. The NAP and this report help to mitigate that and give the sector an opportunity to build recommendations that will help the entire system move forward.

Another challenge has been to determine the level of risk both to the health of the population and to the health of the sector delivering services. These require different approaches that need to be pulled together to form a complete understanding. This needs to stretch further and ensure that it is based around, or at least encompasses communities and their overall resilience and wellbeing. Working together with local authorities (who provide and/or commission much of the social care provided) is essential to understanding the risks and the impacts to develop a platform to support local communities and enable services to be prepared and respond well to climate change induced events.

Most of all this adaptation report has helped confirm that the health sector is moving towards better adaptation to climate change. There has been a useful collaborative start and the sector must now ensure that progress is not only maintained but improved upon. This report proposes that the

recommendations are considered by the National Cross System Group and by each contributing organisation. An action plan has been developed and will be monitored by the National Cross System Group and NAP Steering Group going forward.

The system has built a much better understanding about adaptation to climate change and how this cuts across directorates and organisational boundaries. A future report can build further on this approach by developing links to local authorities and social care providers.

What Next?

The value of developing this report comes to life in the way that recommendations are implemented. This section details the process by which the health sector will take forward the recommendations and monitor implementation.

The Adaptation Report Working Group will feed the work of the report and action plan into the NAP steering group and further develop the implementation plans included in this report.

The DH Sustainable Development and Climate Change Steering Group will ensure that DH relevant actions are being implemented and ensure that it receives a regular report on progress being made towards the recommendations of this report.

The PHE Sustainable Development Programme Board will oversee the implementation of PHE related actions.

The Director of Partnerships, Policy and Innovation will ensure that NHS England is delivering on its actions in partnership with the Wellbeing and Corporate Responsibility Department.

The health sector as a whole will continue to work within current structures to deliver sustainable health and adaptation to climate change going forward. The National Cross System Group is set to provide the leadership and support at national level to support the health sector to adapt to climate change whilst also developing sustainable services.

The table overleaf provides a consolidated list of recommendations, actions, lead agencies and agreed timelines.

Recommendations	Action	Lead Agency	Timeline	Comment
Overarching:				
1. Encourage and support Health and Wellbeing Boards and local resilience forums to work together across the local system (with commissioning groups and primary care) to embed climate change in local thinking and decision making. This includes: - Developing the link between risk assessment, preparedness and responsiveness to emergencies, and longer term planning so that the requirements of the civil contingencies and climate change acts are mutually supportive. - Ensuring that vulnerable people are particularly taken into account as part of these processes and that every effort is taken to reduce health inequalities. - The inclusion of extreme weather events and longer term issues in risk registers. - The inclusion of sustainable development, climate change adaptation and mitigation measures in Joint Strategic Needs Assessments and Health and Wellbeing Strategies.	Encourage uptake of second edition of "Under the Weather" guidance for HWBB	Climate Ready with all partners	04/2015	
	Consider review and collation of risk registers for extreme weather events and longer term climate change	All partners	09/2015	
	Consider peer challenge[58] for sustainability and adaptation in JSNA and HW Strategies	Local Authorities	12/2016	
	Consider other actions required to encourage more deliberate identification of need, risk, joint working etc. in localities	ARP working group	07/2015	
	HWBB toolkit to continue developing exemplars of adaptation practice and how this can link into local working	SDU	06/2015	
	Review literature and research that correlates vulnerable people and communities to effects of a changing climate Consider how to ensure aspects of vulnerability and health inequalities can be in all plans/guidance	ARP working group	12/2015	
	Recommend to LHRPs and LRF that climate change / adaptation is highlighted as a part of planning. Highlight emergencies that are linked to climate change and recommend that work on prevention of climate change and negative health impacts as well as responding to emergencies.	ARP working group	12/2015	
	Occasional review of JSNAs/HWB strategies, SDMPs to	ARP working	11/2015	

[58] http://www.local.gov.uk/peer-challenge

- Supporting local assurance mechanisms to include preparedness and adaptation plans in their processes	understand how this is being addressed, highlight exemplars of good practice and determine if further guidance is necessary	group to consider how to achieve		
2. Consider the best approach to collate a summary of local intelligence and processes (e.g. from PAM and LRFs) to further build national intelligence and in turn support local planning through tools, guidance and national information sets	Consider best approach to collating local data at national level including population health vulnerability risks and health infrastructure risks so they can be used to inform local developments Distribution of or availability of information including SHAPE to wider audiences	ARP working group including DH Estates team /Property services, PHE, SDU	10/2015	
3. Improve the coordination and communication of risks and opportunities so they are aligned with the Health Sector Five Year Forward View, support local processes, and to highlight the case for change	Write narrative to support the dissemination of the ARP report and to support implementation of actions. (This should include the benefits to health now of action to mitigate and adapt to climate change)	SDU and ARP working group PHE and NHS England	06/2015	
4.Consider approaches to develop a national detailed overview of the risks to buildings and infrastructure from projected impacts of climate change and whether these are being assessed and managed	Consider best approach to collating local data so it can be used to inform local developments. This could include costings and savings from early action	DH Estates team/ NHS property services and SDU working group to consider	10/2015	
5. Consider best approach to monitor patient experience in relation to environmental changes in health settings e.g. develop patient survey questions to support understanding of overheating in hospitals	Can patient survey include questions in relation to environmental comfort? Can staff survey include questions relating to level of control/understanding of actions during hot weather Other mechanisms that need to be considered?	CQC NHS England ARP working group	12/2015	
6. Support further development of health estates information to include information on events and clinical incidents related to extreme weather	Development of agreed questions for routine collection e.g. using ERIC	ARP working group SDU and DH Estates	12/2015	

and flooding, and consider best measures to monitor progress in resilience to these e.g. uptake of cooling measures, availability of cool rooms		team SD metrics steering group		
7. Develop indicators (locally and nationally) so the system can measure impact and effectiveness of adaptation plans	Occasional quality assessment of existing adaptation plans	TBC	08/2015 08/2016	
	Development of standard indicators from quality assessments	SD metrics steering group PHE and NHS England analytical teams	12/2016	
National bodies				
All national bodies should have board approved SDMPs which include adaptation plans for themselves and in their role as a national body. The National Cross System Group should be a focal point for monitoring recommendations and progress being made across the sector	National bodies to develop own SDMP including adaptation plan	ALL	03/2016	
	National Cross System Group to invite national bodies to summarise approach on a regular and in turn basis	SDU and NCSG	Every autumn	
	Yearly report on progress to be presented to the National Cross System Group		Every spring	
Providers				
All providers should have a specific adaptation plan with a strategy for adapting estates, operations and fleets. These plans should provide assurance that services can operate within the changing environment and plan for improved solutions where necessary	Summary of report findings and recommendations should be sent to all providers	SDU	07/2015	
	Assurance through NHS Premises Assurance Model – consider best approach to this	ARP working group	10/2015	
Every service should have a robust Business Continuity Management System (BCMS) which ensures the	BCMS assurance processes to include climate change risks	ALL	12/2016	

continuance of critical services during disruptions associated with climate change				
A regular audit of the quality of a number of plans would help ascertain whether they are developed to an appropriate level and if further guidance would be useful	Yearly audit of SDMPs, Adaptation plans (potentially including extreme weather plans) to be carried out with best exemplars highlighted and summary of overall messages on SDU website Determine whether further guidance is necessary	SDU + partners	10/2015 10/2016	
An assurance mechanism through commissioning and contract negotiation could help ensure that these plans are rooted into local plans and discussions.	Discuss approach with contract negotiators and assurance mechanisms CSUs and CCGs to work with providers on the implementation of the NHS contract to develop realistic and enforceable approaches/plans	SDU, CSUs, NHS England	10/2015	
Primary Care				
Consider opportunities for GP practices to be routinely included in development of local adaptation plans and local impact assessments	Consider developing GP guidance for instance by building on existing guidance for small businesses.	SDU CCGs DsPH	03/2016	
Consider opportunities for including climate change adaptation and sustainability actions into guidance for primary care e.g. RCGP business continuity planning guidance	Discuss the potential with Royal Colleges as part of their renewed work programme on SD	AoMRC, RCGP, BMA	08/2015	
Consider risks and opportunities from climate change in the commissioning of primary care for a local population	Consider how best to include this in existing guidance	NHS England, SDU	12/2015	
Improve engagement and understanding of role of primary care through lead role of appropriate bodies such as British Medical Association (BMA), British Dental Association (BDA) and RCGP	Develop an approach with Royal colleges and RCGP to take this agenda forward and respond to the recommendations in this report	RCGP, AoMRC	08/2015	
Practitioners need to be asking questions regarding adaptation and	TBC			

resilience planning in their local areas and feeding in the knowledge they have of their registered populations				
Commissioning				
CCGs are supported to include adaptation in their contractual discussions and to link into and work with LRFs in this regard	Develop a toolkit for commissioners (for CCGs or wider) to support their approach. This could also encompass commissioning for social care and other services	SDU	12/2015	
Health and Wellbeing Boards				
There is a need to develop better information and data capture systems to measure actions that local authority public health departments and HWBs are undertaking. This should not only include direct action taken by HWB's but also those undertaken by other departments and committees within the local authority	Consider how best to approach in discussion with LGA, Solace and London Authorities, ADPHs and ADASS	SDU Metrics steering group	08/2015	
Information resources for local councillors could be developed to increase knowledge and understanding and build political will regarding adaptation and its importance.	Pool resources across SDU, LGA and Kings Fund to make them more accessible to councillors: http://www.local.gov.uk/public-health http://www.kingsfund.org.uk/publications/improving-publics-health http://www.sduhealth.org.uk/resources/practical-guides-and-briefings.aspx Consider developing a return on investment tool or pull together resources from existing ROI tools to highlight saving that might accrue from investment now	ARP working group	12/2015	
Support HWBs to recognise adaptation and climate change as a priority and highlight it in their discussions and	ARP working group and leads for HWBB to consider most appropriate approach	ARP working group ALL	12/2015	

future plans. Members of boards can use their influence to promote adaptation in their wider circles of influence				
HWBBs can encourage the longer term perspective which will lead to more sustained improvements in the population's health by adopting preventive rather than reactive solutions to climate change	TBC	ARP working group	10/2015	
Voluntary Sector				
Support the voluntary and community sector to better understand and responds to the implications of a changing climate on service delivery and the lives of the vulnerable people they support. (support through training/resources and commissioning criteria)	TBC	NCVO JRF SDU	10/2015	
Encourage greater coordination across the health and social care system to build solutions and recognise the VCS potential role in both representing the needs of, and reaching and strengthening vulnerable communities.	TBC	NCVO JRF SDU	10/2015	

PART ll

Part ll of this report describes in more detail some sections of the health sector and any specific evidence and recommendations. These are broken down into the following sections: National bodies, Providers, Primary Care, Commissioners, Health and Wellbeing Boards and the Voluntary Sector.

National Bodies

Introduction

The new health and care system became fully operational from April 2013 to deliver the ambitions set out in the Health and Social Care Act (2012)[59]. NHS England, PHE, the NHS Trust Development Authority (TDA), NHS Property Services and Health Education England (HEE) assumed their full range of responsibilities, along with CCGs, HWBs and the movement of public health into local authorities. These changes have affected the continuity of plans and governance structures that were once in place to cover sustainable development and climate change issues. However, the requirements of the CCAct and other legislation have demanded that appropriate action is taken to assess and manage the risks to public health and the health and care system from the impacts of climate change.

A full list of the National Bodies and their roles can be found in Appendix 3.

Risk

Since 2002 DH has commissioned risk assessments on the health of the nation with regard to the impacts of climate change. This work was built on when the first CCRA was conducted for the health sector and is detailed in Part I.

Planning

Department of Health

As steward of the health and care system DH is committed to long-term sustainable development, ensuring that by delivering better care and well-being for the nation it is also contributing to a strong, healthy and sustainable society for future generations. This fundamental principle underpins DH's health and social care vision, such that sustainability resonates with both staff and stakeholders.

[59] http://www.legislation.gov.uk/ukpga/2012/7/contents/enacted

A Director-level DH Sustainable Development and Climate Change Steering Group was set up in 2014 chaired by the Deputy Chief Medical Officer to address the Government's vision to mainstream sustainable development across departments. The group's role is to embed sustainable development within governance, policy making, operations and procurement, so that it becomes central to the way that policy is made, buildings are run and goods and services are purchased (as outlined in the DH Corporate Plan 2014 – 2015, Chapter 6)[60].

DH leads a National Adaptation Steering Group, to implement the two objectives it owns in the NAP (objectives 11 and 12). Much of the work to implement these objectives is carried out by DH's Arm's Length Bodies (ALB), as set up in the Health and Social Care Act 2012 – primarily NHS England and Public Health England (who also jointly fund the Sustainable Development Unit to coordinate this implementation) and with support from Defra and the Environment Agency.

The DH published the Health Building Note '*Planning for a resilient healthcare estate'* to provide guidance. The aim is to help NHS-funded providers determine appropriate levels of resilience for sites, buildings and installations against a wide range of emergencies, hazards and threats and their impacts and consequences including resilience to the impacts of climate change.

Sustainable Development Unit

NHS England and PHE jointly fund the SDU to ensure that the health, public health and care system fulfils its potential as a leading sustainable and low carbon service. The SDU develops organisations, people, tools, policy and research which will help to promote sustainable development, to reduce carbon emissions and to adapt to climate change. The Unit also helps local authorities and their health and wellbeing boards to help embed the principles and benefits of sustainable development within local cross system approaches to health and well-being. The Sustainable Development Strategy was launched in January 2014 to support more sustainable, resilient, healthy people and places.

NHS England

NHS England hosts the SDU supporting the SDU work and the Sustainable Development Strategy and its supporting modules. This system-wide work falls within the portfolio of the National Director for Commissioning Strategy.

As with many organisations, there are pockets of good practice regarding sustainable development but there is still much to do. NHS England has committed to continue to explore ways to integrate sustainable development objectives in its direct commissioning of services and by robust assurance of the NHS standard contract. In addition these objectives are to be further embedded through assurance of indirect commissioning and through NHS England's commissioning system leadership.

NHS Trust Development Authority (TDA)

The NHS TDA published guidance in December 2013 for NHS trust boards to help them plan the long term delivery of their services for patients. Securing Sustainability – Planning Guidance for NHS Trust Boards 2014/15 – 2018/19 sets out what NHS boards should focus on to be able to continue to

[60] https://www.gov.uk/government/publications/department-of-health-corporate-plan-2014-to-2015

deliver high quality care today whilst taking the necessary action to ensure they can continue to do so in the future.

Public Health England

PHE recognises the links between health and the environment and that care of the environment must be one of its key concerns. Sustainable development in PHE is co-ordinated via a programme board which reports to PHE's National Executive. The work of this programme board encompasses the way PHE behaves as an organisation and its impact on the environment; developing and disseminating the evidence base and supporting local action in regard to sustainable development and climate change adaptation, and being a clear advocate for healthy, sustainable and resilient communities. The programme board also interacts with a number of other external bodies, such as those from academia.

PHE was the first national health organisation to have a Board-approved SDMP and has published PHE's Sustainability Annual Report. PHE interacts with its staff through its mandatory Sustainable Development e-learning course. This training programme informs PHE employees about sustainability within the organisation and what they can do to embed sustainability into the organisation. All materials explicitly include information about climate change risk, mitigation and adaptation work.

PHE is providing input to the second CCRA, giving feedback to Defra on priority areas and are heavily involved in the NIHR Health Protection Research Unit in Environmental Change and Health. In addition PHE is setting up methodologies for assessing the health effects of heat and cold taking adaptation into account, ground-level ozone in the UK and climate change in the domestic indoor environment.

PHE coordinates the cross-system Heatwave Plan and Cold Weather Plans for England and provides guidance on minimising the health impacts of flooding. Off-the-shelf exercises and e-learning modules for extreme events are being developed as a self-use resource for internal and external bodies to assist in emergency planning and preparedness. A series of national and regional workshops are being held in collaboration with colleagues from NHS England to develop work to promote healthy, sustainable and resilient communities.

National Bodies Survey Responses

The National Bodies survey that was sent out by DH was answered by HEE, Monitor, NHS Confederation, NHS England, NHS Property Services Ltd, NICE, PHE, and NHS TDA. The responses showed that 3 of the 8 national bodies have adaptation plans in place, with 2 of those undertaking risk assessments and one is monitoring the impact of climate change on the health and care system. The majority of national bodies felt that they address partnership working within the system as members of the National Cross System group on Sustainable Development. The full results of the survey sent out to all national bodies can be found in Appendix 4.

Opportunities

National bodies have a real opportunity to further demonstrate their leadership by collaborating on sustainable development and ensuring that mechanisms are embedded in arm's length bodies and the sector they support. Early planning can reap financial benefits and ensure that communities are well served and supported during weather events and furthermore develop a more integrated approach to health and wellbeing.

Social care

Social care is an integral part of the system and of local authority delivery to support vulnerable people. Overall 33 thousand[61] care homes and 23 thousand[62] service providers of care in people's homes support 1.3 million[63] people across a breadth of services that vary from meals on wheels, to housing adaptations and specific counselling support.

Social care services need to consider the effects of climate change in collaboration across the health and care system because there is such an inter-relationship between them. Real resilience and preparedness is best taken forward across these boundaries.

This report focuses on the health sector for pragmatic reasons of time and resource. A future round of reporting would ideally include social care. This could be facilitated through a joint approach when local authorities are also reporting in some form.

Assumptions and uncertainties

Climate change is having effects on land, sea and air[64]. The changes are occurring more rapidly than initially thought. Uncertainties remain as to how much carbon reduction is likely to be implemented and therefore which climate change scenario is most likely.

Barriers

As with most organisations, the impacts of climate change and the importance of reducing emissions are often only recognised by a few dedicated staff members, with pockets of good practice. There is often no wide spread culture of sustainability across organisations, which is demonstrable in all policies and practices. Staff understanding of the issues is likely to range from engaged and understanding to scepticism. Barriers are therefore primarily concerning culture and behaviour change, deeming the problem too big to solve, or too far away in the future, with the issue often being left to a small team to implement change on behalf of the organisation.

[61] http://www.cqc.org.uk/content/care-homes
[62] http://www.cqc.org.uk/content/services-your-home
[63] http://www.hscic.gov.uk/searchcatalogue?productid=16628&topics=0%2fSocial+care&sort=Relevance&size=10&page=1#top
[64] http://www.ipcc.ch/report/ar5/

Recommendations

All national bodies should have board approved SDMPs which include adaptation plans for themselves and in their role as a national body.
The National Cross System Group should be a focal point for monitoring recommendations and progress being made across the sector.

Providers

Introduction

Healthcare provision by the NHS (NHS providers in this report) accounts for 60%[65] of the health sector budget. Provider organisations range from major acute specialist centres and community services, to ambulance trusts and social enterprises. In addition some services are delivered by the private sector although this is relatively small (circa 9%) and not included here. This section focuses on the mainstream NHS providers and their services.

These services are reliant on infrastructure such as hospitals, clinics, vehicles, utilities and information technology in order to function. Other supporting infrastructure including the delivery of goods, transport networks and roads, utilities and computer networks play a key role however they are mostly owned by external parties and not covered in this report.

Close to 90% of NHS property is owned by individual NHS organisations and the remaining buildings (3800 community hospitals and other primary care buildings once owned by primary care trusts) are in the ownership of NHS Property Services Ltd.

Risk

The health sector uses a number of tools to establish the suitability of its infrastructure at local level, however there is no detailed overview of the collective risks identified nor the quality of the planning undertaken in managing these risks.

NHS Premises Assurance Model (NHS PAM)

DH has produced the NHS Premises Assurance Model (NHS PAM) to support trusts to assure their estates. This management tool is designed to provide assurance and a nationally consistent approach to evaluating NHS premises performance against a set of common indicators. It delivers a basis for:

- assurance on the premises in which NHS healthcare is delivered
- driving premises-related performance improvements throughout the system
- providing greater understanding of the vital role that NHS premises play in the delivery of improved clinical and social outcomes

PAM includes questions that provide an insight into the evaluation of the infrastructure adaptation to climate change and more specifically:

- whether they have a well-managed annually updated board approved sustainable development management plan
- whether there has been a review of all relevant statutory requirements and guidance, a risk assessment undertaken and any necessary risk mitigation strategies applied and regularly reviewed

[65] Understanding the NHS http://www.england.nhs.uk/wp-content/uploads/2014/06/simple-nhs-guide.pdf

- whether the impacts have been considered and if relevant incorporated requirements into resilience, emergency, contingency and escalation plans.

National assessments

The National Assessment of Flood Risk by the Environment Agency used sophisticated GIS products to evaluate which buildings are in a flood plain zone, and therefore at potential risk of flooding. Around 6-8% of hospitals, care homes and surgeries are at risk of flooding[66].

Research assessing hospital building design types identified that a high percentage of wards are at risk of overheating based on their design. Implementation of passive and active cooling measures would significantly reduce this risk.

Information is not available nationally to evaluate if the projected and current impacts of climate change have been included in the risks and whether these are being assessed and managed.

Planning

Provider services plan both in responding to incidents and for longer term expected changes to services and infrastructure. However national effectiveness is only reviewed for incident planning.

Acute provider organisations and ambulance services fulfil key duties in major incidents and emergency responses (these services are identified as category 1 responders under the CCA). They must ensure the continuation of critical activities during and after a significant business disruption, done by implementing a robust business continuity management system (BCMS). They are therefore closely linked into the local resilience forums and involved in these multi-agency activities which include regular joint training and exercising plans.

Ambulance services are a key organisation in providing a joint response to a disruptive challenge, recognised in the Joint Emergency Services Interoperability Programme (JESIP)[67] doctrine, which provides co-ordination and a joined up understanding of risk.

Planning to reduce the risk from climate change requires more strategic planning. NHS organisations are encouraged to develop an SDMP that is approved at board level and includes an adaptation plan. Guidance available on the SDU website suggests this should be based on UKCIP projections and take a local system approach.

The standard NHS contract for 2015-16 includes clause [18.2] which states:

> The Provider must maintain a sustainable development plan in line with NHS Sustainable Development Guidance. The Provider must demonstrate its progress on climate change adaptation, mitigation and sustainable development, including performance against carbon

[66] Adaptation Sub-Committee (2014) Managing climate risks to well-being and the economy: Progress report 2014

[67] http://www.jesip.org.uk/

reduction management plans, and must provide a summary of that progress in its annual report.

How are NHS providers doing on adaptation planning?

The number of NHS organisations with an SDMP is an indicator in the Public Health Outcomes Framework (PHOF). The extent of adaptation planning considered at board level is captured through the annual SDMP survey of board approved plans including the following question:

> *"Do your board approved plans address the potential need to adapt the delivery of your organisation's activities and organisation's infrastructure as a result of climate change and adverse weather events?"*

The responses to the March 2014 survey are highlighted in the table below:

Organisation type	Percent Overall Yes
Providers	38%
Ambulance trusts	70%
CCGs	18%
Overall	29%

It is worth noting that this percentage is lower than on previous years, possibly due to the structural changes in the health care sector and the overall questions requiring assurance that the plan is board approved and reviewed within the last year.

Ambulance service providers have a national Climate Change Adaptation Plan which details how they will respond to extreme climatic change events. Nationally, ambulance services feed into a group specifically for green and sustainability issues called the Green Environmental Ambulance Service (GrEAN). This group reports to the Association of Ambulance Chief Executives (AACE) via the Ambulance Service Directors of Finance. There is also a national network of Business Continuity and Resilience Groups.

Mechanisms are not currently in place to assess the quality of adaptation planning for NHS providers; however the SDU adaptation guidance provides a self-assessment along with the SDU Good Corporate Citizen (GCC) assessment tool. The GCC uses the well-recognised risk, planning and impact approach. The results suggest that over three quarters of providers feel that they identify the risks and consider their ability to cope with climate change events that pose a risk to services. Around two thirds feel that they have sufficient workforce service provision to be able to continue to

deliver services in the event of extreme weather events. Detailed results from the GCC analysis for Providers can be found in Appendix 4.

Impact

There is no current monitoring of impacts of climate change on providers or effectiveness of adaptation planning.

Opportunities

Warmer winters could mean reducing winter pressures for acute services although this may be outstripped by the likely increase in elderly and vulnerable populations.

Assumptions and Uncertainties

This report relies on self-assessment and responses that are not audited separately. The assumption is that if a plan is in place and approved at board level, the organisation is taking adaptation to climate change seriously. There is little indication of the quality of adaptation plans and the monitoring of their impact and implementation are not currently undertaken.

Barriers

The recent restructuring of the health sector means it is more complex to ensure that all relevant organisations are accounted for and working in a joined up way. For instance the delineation and ownership of estates and facilities and tracking of information across these premises has become more complex.

Planning cycles could include more information for instance about flood zones, heat islands and roads likely to be subject to closure. This would mean that any required relocation of premises to flood free zones, necessary building refurbishments and the procurement of fleet vehicles are planned for early and also fulfil other sustainable development criteria.

Recommendations

- All providers should have a specific adaptation plan with a strategy for adapting estates, operations and fleets. These plans should provide assurance that services can operate within the changing environment and plan for improved solutions where necessary.
- Every service should have a robust BCMS which ensures the continuance of critical services during disruptions associated with climate change.

- A regular audit of the quality of a number of plans would help ascertain whether they are developed to an appropriate level and if further guidance would be useful.
- An assurance mechanism through commissioning and contract negotiation could help ensure that these plans are rooted into local plans and discussions.

Primary Care

Introduction

The majority of health care is delivered through primary care structures with 340 million GP consultations annually. Primary care tends to be provided from smaller, local facilities so continuity plans focus on fall back and contingency arrangements. GP practices are often the first point of contact for individuals who are seeking support in relation to their health and wellbeing. They see surges in illness early on and will be impacted by early changes in weather patterns. Primary care including community pharmacies are more in touch with vulnerable people and will also see the consequences of the poor management of emergency support and responses, for instance in the rise of mental health issues relating to flooding.

Risk

Assessments of risk to primary care infrastructure including the fall back and contingency arrangements have not ascertained the level of risk overall from climate change. At local level however risk assessments are likely to include some level of continuity planning for primary care. Professionals working in primary care will be aware of local vulnerable people and are well placed to offer support. Climate change is not currently considered in the commissioning of primary care by NHS England.

Planning

A short survey was sent out to GPs to determine the current awareness of adaptation planning in place for practices both internally as well as externally via CCGs, NHS England sub-regional teams and the local DH. The responses suggest that there is little confidence in the plans currently generated across the sector. This section summarises two surveys that were carried out to better understand the level of awareness and preparedness within the primary care settings of GPs and dentists.

General Practitioner Survey Results

The Royal College of General Practitioners (RCGP) developed a short set of questions for GPs. Only 47 responses to the voluntary national survey were received, where only half of responders felt that they were confident that their practice has adaptation plans in place to remain resilient in adverse weather events. When asked if the practice was confident that their local CCG or health board has adaptation plans in place less than 20% of responders agreed, with 56% disagreeing. When the same question was asked regarding NHS England sub regions 61% of practices disagreed with 15% confident in the local area team plans.

This small snapshot of GP practice views suggests that there is little coordination between GP practices and their relevant CCGs or NHS England local area teams. It is however encouraging that the survey suggests that half of the practices that responded are addressing adaptation issues with their own plans. Clearly more coordination across local health economies is needed to ensure a more streamlined and aligned approach.

Dentistry Survey Results

A questionnaire was sent to all 40 consultants in dental public health, and 80 clinical directors of community dental services within England with a response rate close to 40%.

Consultants were not confident that within dentistry the risks to providing dental care from a changing climate and adverse weather events were assessed either by local dental providers (81.25%), or by PHE (69%). The majority of the respondents (69%) were also not confident that plans were in place by local dental providers or by PHE to either monitor or minimise the negative impacts to dental care from climate change. Comments were made that dental services should all have contingency plans for events such as floods etc., but the group was doubtful as to whether climate change was specifically considered within these plans.

Clinical directors work for community dental services, which are predominantly managed by larger organisations responsible for other healthcare areas. When clinical directors were approached a small majority (58%) agreed that the risks to providing dental care had been assessed by their organisation with 23% disagreeing. Two in three of the directors agreed that plans had been put in place by their organisation.

In contrast there was no clear view from the directors as to whether the impact of a changing climate had been monitored within the organisation with 34% disagreeing, 45% agreeing and the rest unsure. Comments included that within this area, dentistry was low priority or not considered. The fact that community dental services are managed by larger organisations may mean they are more likely to have considered climate change within the overall organisational plan rather than specifically focussing on dentistry.

Opportunities

Primary care is a fundamental component of the health care sector and as such can play a key role in supporting people and health care services to respond to adverse weather events and provide insights into how to support vulnerable people.

Assumptions and uncertainties

A baseline assessment has not been carried out other than progress through local plans which is varied.

Barriers

The main barrier that has emerged relates to understanding where responsibility lies in preparing for climate change and managing the risks. GPs clearly play a key role and need to be linked into the local plans however they also need to ensure that their own practices are identifying the risks and managing processes to deal with these.

Recommendations

- Consider opportunities for GP practices to be routinely included in development of local adaptation plans and local impact assessments.
- Consider opportunities for including climate change adaptation and sustainability actions into guidance for primary care e.g. RCGP business continuity planning guidance.
- Consider risks and opportunities from climate change in the commissioning of primary care for a local population.
- Improve engagement and understanding of role of primary care through lead role of appropriate bodies such as British Medical Association (BMA), British Dental Association (BDA) and RCGP.
- Practitioners need to be asking questions regarding adaptation and resilience planning in their local areas and feeding in the knowledge they have of their registered populations.

Commissioning

Introduction

In England over £88 billion is spent on health and care services commissioned locally[68].
Commissioners have a key role to ensure that services demonstrate progress being made on climate change mitigation and adaptation.
Due to resource constraints of this report the commissioning component will only focus CCGs who commission 68 % of healthcare services. CCGs have a relatively small infrastructure footprint in terms of their estate. They are often minority tenants and may have little influence over decisions to improve the resilience of their offices. They also can be the primary funders of NHS estates through NHS Property Services Ltd.

Risk

Commissioners link into their local HWBs and LRFs to ascertain local risks and plan accordingly. There is no country-wide risk planning carried out specifically for commissioners in relation to adaptation to climate change.

Planning

As a commissioner of services CCGs have significant power to effect change through contractual mechanisms, service specifications and expectations. CCGs are well positioned to utilise the NHS Standard Contract to demonstrate the health system's commitment to adaptation[69].

CCGs are asked to take part in the data collection around the current state of their SDMP. Their component of the SDMP survey question relating to adaptation plans is summarised below.
79% of CCGs responded to the SDMP survey and of them 19% responded that they have a current board approved SDMP or carbon reduction management plan (CRMP) (which is equivalent to 15% of all 211 CCGs).

Three further questions relating to the content of their plans were posed. The following table summarises the questions and responses:

	% of all 211 CCGs
Is your SDMP (or equivalent) on track for an absolute carbon reduction target of 10% by 2015 on a 2012 baseline?	7%

[68] http://www.sduhealth.org.uk/areas-of-focus/commissioning-and-procurement.aspx
[69] NHS England, 2015. 2015/16 NHS standard contract [Online] Available at: http://www.england.nhs.uk/nhs-standard-contract/15-16/ [Accessed 11 March 2015]

Have you registered and completed the Good Corporate Citizenship (GCC) version 3 assessment?	13%
Do your board approved plans address the need to adapt the delivery of your organisation's activities and organisation's infrastructure as a result of climate change and adverse weather events?	18%

Interestingly 17 CCGs have a governing body/board approved adaptation plan for both infrastructure and activities as a result of climate change although they have no SDMP.

The commissioners' response to the GCC self-assessment tool revealed that around two thirds of the 32 commissioning organisations that carried out the assessment feel they understand the risks and vulnerabilities associated with climate change. Over three quarters of these commissioners consider that they have the ability to cope with rising extreme weather such as heat waves, flooding, cold spells and increased pollution and UV sunlight exposure and other projected disruptive events. Over half feel that they review risks to estates, buildings and supporting infrastructure with just over a third developing actions plans from their risk assessments.

Opportunities

CCG's hold a lot of influence in the way services are managed and delivered because they have control over financial flows. They are therefore in a good position to ensure that their providers and local health economy consider adaptation as part of their strategic planning processes.

Assumptions and uncertainties

The assumption is that if a plan is in place and approved at board level, the organisation is taking adaptation to climate change seriously. There is little indication of the quality of adaptation plans and the areas covered, nor of the level of discussion that is taking place during contract negotiations or assurance processes.

Barriers

CCGs have a small infrastructure footprint in terms of their estate. They are often minority tenants and may have little influence over decisions to improve the resilience of their own premises. CCGs often have competing priorities in the management of their provider performance and may not prioritise action on adaptation.

Recommendations

- CCGs are relatively new organisations and may not be sure how best to include adaptation in their contractual discussion nor how best to influence LRFs in this regard. A toolkit for commissioners could support their approach and could encompass commissioning for social care and other services.

Health and Wellbeing Boards

Introduction

In April 2013 the responsibility for public health transferred to local government. The Health and Social Care Act 2012 established HWBs as local forums where key leaders from the health and care system work collaboratively to understand their local community's needs and agree priorities. Boards provide an opportunity to bring together SDMPs, and the teams that produce them, to enable a cross sector approach where work can be undertaken at scale rather than being seen as single organisational issues. The local Joint Strategic Needs Assessment (JSNA) analyses the health and social care needs of their populations and underpins the Joint Health and Well-being Strategy (JHWS), which sets out the HWB's priorities. Thus HWBs are potentially important vehicles for encouraging local health economies to plan for climate change.
There are over 150 HWBs across England operating in different ways and with various priorities according to local need and characteristics of the local health economy. Despite the intention that HWB's would be key strategic bodies with the power to shape the system, in reality some have been more successful than others in setting direction and influencing decisions.

Many local authorities have been promoting the sustainability and climate change agenda for a number of years, including action on transport, recycling, environmental issues, planning, housing and community engagement work. It is important to recognise that adaptation is also considered by many local authority committees such as planning and transport. However, HWBs still have a key role in helping to address adaptation through public health initiatives such as the green environment; home insulation policies, promoting active travel and physical activity; healthy eating and encouraging local food policy leading to reduced food miles and stronger communities.
Through their wide roles and responsibilities local authorities are ideally placed to engage with local communities to build community cohesion, resilience and preparedness for the effects of climate change. This may be on the specific issue related to emergency preparedness e.g. flooding or more generally via other health and wellbeing initiatives. Local authorities also have a detailed knowledge of local resources and vulnerabilities including sections of the population (elderly, young, ethnic minorities) who may be more at risk of the effects of climate change. Specifically in relation to emergency planning and recovery, guidance has been developed to encourage local communities to work together to become more resilient and increase their ability to band together to help each other[70]. At the present time there is no way of measuring how extensively this guidance has been used and implemented.

Risk

Alongside the national level risk assessment required by the Civil Contingency Act 2004, Local Resilience Forums (LRF) are required to produce a community risk register that reflects the unique

[70] https://www.gov.uk/government/publications/community-resilience-resources-and-tools.

characteristics of their local area.[71] The local health resilience partnership (LHRP), a sub group of the LRF is charged with planning for health emergencies. The LHRP brings together representatives from all the local health organisations and as such is ideally positioned to make a comprehensive risk assessment of the threats locally from climate change. In addition each local authority will also have its own multi-agency emergency planning structures and mechanisms which will coordinate planning and implementation at the local level. This fosters a joined up approach to risk assessment and emergency planning.

Plan

It is difficult to get a clear picture of the amount of work HWBs and local authority public health departments are undertaking specifically in relation to adaptation as it may go unrecognised or be included in other areas of work. There are no specific measures of activity, only proxy measures:

1) The Local Government Association (LGA) mapped the priorities of all the HWBs in England[72]: This analysis grouped the HWBB's priorities into 30 topic areas, some of which are linked to adaptation. This found that 28% of HWBs considered building safe, sustainable communities among their top priorities. However many HWB's may not interpret this as a climate change adaptation, but more as increasing social capital and improving health without specific reference to climate change.

2) Climate Local, an LGA initiative supported by the Environment Agency, which encourages councils to cut carbon emissions and increase resilience for a changing climate reviewed 47 local climate action plans covering 64 local authorities.[73] This showed that the majority of actions that councils were planning to take were in relation to carbon reduction, with only 27% of actions focused on adaptation. There was also little evidence found that actions are being linked to health strategies or JSNAs.

3) The SDU and the Environment Agency sent a questionnaire to all HWBs in September 2014 to assess three major elements of their adaptation plans: risk assessment, adaptation planning and impact and evaluation of the effects of climate change on health and wellbeing locally. Only 19% of HWBBs responded and the results are likely to be biased in favour of HWBs that are more active in this area. Of the 29 Boards that responded:

- 69% reported that they have risk assessments in place for the effects of climate change and extreme weather events
- 62% had local plans in place to address the negative impacts of climate change
- 65% reported that the impacts of climate change on health and wellbeing were being monitored locally.

[71] https://www.gov.uk/government/publications/the-role-of-local-resilience-forums-a-reference-document
[72] http://www.local.gov.uk/health-and-wellbeing-boards/-/journal_content/56/10180/6111055/ARTICLE
[73] http://www.local.gov.uk/documents/10180/49938/Analysis+of+Climate+Local+Actions+FINAL.pdf/56d48b4f-3d2b-4759-90ce-32c5cf04c83a

Opportunities

Political momentum needs to be built to increase awareness and develop policies in the field of adaptation. Directors of Public Health, as chief medical advisors to the local authorities, should be ideally positioned to educate and influence councillors and hence build political will to address climate change.

Local authority public health departments and HWBBs are well placed to encourage cross-system working by highlighting adaptation's importance, and ensuring that plans are coordinated across the local health economy. Many public health teams in local authorities work as networks rather than as discrete departments, with staff based in other key directorates across the council. This provides a good opportunity for adaptation work to be promoted and recognised, but can also lead to fragmentation and a lack of leadership and coordination, which is a risk that needs to be addressed.

PHE is developing capacity within the local public health workforce for staff working on spatial, housing, and transport planning to maximise the impact of health and wellbeing through their work. There is a role for HWBBs, with support from local public health teams, to contribute to the debate on future housing needs and requirements, taking into account climate change projections. The additional challenges posed by climate change highlight the need for proper long term strategic housing reviews at the local and regional level.

Assumptions and uncertainties

- Local authorities and their HWBs work in a variety of ways and have adopted different priorities. This may lead to an incoherent approach to adaptation resulting in a lack of progress particularly over wider areas than an individual council's geography.

Barriers

- The wider view of health that is required to address adaptation to climate change may be lost in these competing priorities.
- Local councillors may only wish to focus on their ward populations without considering the wider implications of climate change.
- Some local councillors may not be aware of or deny the threat that climate change poses. This can make it difficult to get climate change and adaptation on to the agenda in order to influence policy and achieve change.
- Some councillors may see climate change as being linked to the Green Party agenda and therefore do not consider it politically appropriate to be perceived as supporting initiatives and policies that highlight the threat that it poses.
- Local authorities have seen a considerable reduction in their budgets over recent years which restricts their ability to carry out work on adaptation. Budgetary restrictions encourage a short term emergency responses focus to events such as flooding, even though in the longer term it is more cost efficient to invest in adaptation measures to prevent incidents occurring.

Recommendations

- There is a need to develop better information and data capture systems to measure actions that local authority public health departments and HWBs are undertaking. This should not only include direct action taken by HWB's but also those undertaken by other departments and committees within the local authority.
- Information resources for local councillors could be developed to increase knowledge and understanding and build political will regarding adaptation and its importance.
- Support HWBs to recognise adaptation and climate change as a priority and highlight it in their discussions and future plans. Members of boards can use their influence to promote adaptation in their wider circles of influence.
- HWBs can encourage the longer term perspective which will lead to more sustained improvements in the population's health by adopting preventive rather than reactive solutions to climate change.

Voluntary Sector

Introduction

The voluntary and community sector[74] is hugely diverse in terms of size and income. There were over 161,000 active voluntary organisations in the UK in 2011/12 (equivalent to one voluntary organisation for every 395 people), ranging from large organisations (incomes of £30 million plus) to small community groups sometimes described as 'below the radar'[75] and run largely by volunteers. Among voluntary and community sector organisations (VCOs) 51% have an annual turnover of less than £10,000. Approximately 23% provide services relating to health and social services with a total income of £13.3 billion, and assets of £19.9 billion[76]. The type of health work that voluntary and community organisations do falls mainly into four categories[77]:

- Provision of services often to disadvantaged groups (including information, advocacy and advice, in addition to health and social care)
- advice to commissioners, planners and funders
- medical research
- policy and campaigns.

Many VCOs integrate both health and social care services[35].

Why adaptation is important

A changing climate will affect many aspects of VCOs' ability to deliver services (affecting buildings, emergency services, vehicles, and transport and care delivery) and supply chain (e.g. fuel, food, communications). Early work by Scottish sustainability knowledge charity SNIFFER (2009)[78] emphasised how climate change would have a disproportionate impact on more deprived communities and households. Disadvantaged groups are generally less able to manage risks because they lack financial, social, educational or other resources. The consequence of not taking action to

[74] The term 'the third sector' is often used by government and refers to the voluntary and community organisations, the trade union and co-operative movements. The voluntary sector is more widely used but excludes trade union and co-operative organisations. Hale, S. *(2010) The new politics of climate change: why we are failing and how we will succeed*, Environmental Politics Vol. 19, Iss. 2, 2010

[75] McCabe A. and Phillimore J. (2012) All Change? Surviving 'below the radar': community groups and activities in a Big Society, Third Sector Research Centre Working Paper 87 September 2012

[76] This sub-sector uses a broad definition of social services and includes organisations such as Barnardo's, Age UK, Mencap and Crisis as well as charities engaged in emergency relief like the RNLI. ACVO Almanac, 201

[77] King's Fund (2011) The voluntary and community sector in health: Implications of the proposed NHS reforms, available from: http://www.kingsfund.org.uk/publications

[78] SNIFFER (2009) Differential Social Impacts of Climate Change in the UK, available at: http://www.sniffer.org.uk/

adapt to a changing climate will exacerbate existing disadvantage[79].

The voluntary sector work directly with vulnerable and disadvantaged communities and play a key role in emergency response and coordination. They also advocate on behalf of their service users and act as a bridge between sectors.

The National Council for Voluntary Organisations (NCVO) survey indicates that awareness of the consequences of a changing climate is still low among VCOs and at the moment many barriers exist that prevent them taking action to build climate resilience. However, work with VCOs to develop their understanding of the issues of a changing climate has highlighted the unique role they can play in helping to find appropriate solutions to this societal challenge - as a matter of social justice (Barings Foundation)[80].

Risk

Awareness of the risks resulting from a changing climate is generally low in VCOs except for organisations who have been affected by severe weather or who have played a significant role in responding to extreme events. Only 35% of the 120 organisations in the NCVO survey say they have undertaken a climate risk assessment. However, when provided with information about a changing climate they are able to identify the effects on their operations and service users and can respond with a range of valuable actions. For example to:

- Identify vulnerable people in their community, to provide targeted support in extreme weather conditions.
- Work directly with communities to strengthen their resilience so they are better able to deal with, and recover from shocks when they occur, often acting as a trusted intermediary[81]
- Work with local authorities and NHS bodies to ensure their users' needs are addressed in climate change policies and plans.
- Support their service users to campaign on climate change[38].

However, organisations can struggle to translate awareness into meaningful responses where they lack resources. VCOs offer significant potential in reaching and building the resilience of vulnerable people and communities but to mobilise this latent force requires support and investment.

Opportunities

The voluntary sector is already well connected to, and often works directly with, many of the more vulnerable people who will be affected by climate change. This makes it easier to encourage

[79] Lindley, S., O'Neill, J., Kandeh, J., Lawson, N., Christian, R. and O'Neill M. (2011) Climate change, justice and vulnerability, Joseph Rowntree Foundation, York

[80] NCVOc (2013) The Vulnerable People and climate change project report 2013

[81] Brisley R., et al (2011) Socially just adaptation to climate change, Joseph Rowntree Foundation, York

preparedness, provide services and advocate for vulnerable people and local concerns in national level planning.

There is already a lot of experience in parts of the voluntary sector of supporting community level responses to environmental issues including the Transition Towns Network, local flood action groups and food growing groups. This will be invaluable for responding to climate change stresses and shocks and building longer term community resilience.

Voluntary organisations have the potential to play a significant role in organising, mobilising, catalysing and bridging between different groups and organisations needed in order to develop an effective and sustainable response to a changing climate, particularly but not only at, the local level.

Assumptions and uncertainties

The voluntary sector is expected to continue to play a key role in the provision of health and social care with the likelihood that it will increase in a changing climate[82]. This increased responsibility may come without extra resource and possibly with a reduction in funding[83].

The capacity of the voluntary sector to absorb increased volumes and patterns of demand is limited. Linked to this are assumptions about the capacity for volunteering to grow to take on some of this expanded role and increased demand for services, which is untested.
Large numbers of organisations are small and are volunteer led limiting their capacity to plan longer term as their focus tends to be on coping day to day.

As it stands now, the VCS is unlikely to put climate change above other existing priorities, particularly fundraising, without the injection of resources and a clear case as to why it is relevant. Awareness raising in the sector needs to link to action that is meaningful as judged by the VCOs themselves.

Barriers

Lack of clear roles and responsibility
Direct service delivery is a growing role for VCOs but when these roles are dispersed across a number of private and voluntary sector organisations developing a collaborative and long term response to the impacts of a changing climate becomes much harder to coordinate. Ownership of adaptation plans may come down to local politics. As in all adaptation planning the local context is very influential and must be taken into account if plans are to be sustainable.

[82] NHS (2014) Planning Guidance for Health and Social Care organisations, Sustainable Development Unit and Public Health England, available at: http://www.sduhealth.org.uk/resources/
[83] King's Fund (2011) The voluntary and community sector in health: Implications of the proposed NHS reforms, available from: http://www.kingsfund.org.uk/publications

Poor coordination between organisations

It may not be until a severe weather event that arrangements are set up. There is a need for much better integration between voluntary and community sector and local authorities, particularly as adaptation may require integration across agendas e.g. health and environment. This could include improving contracting between CCGs or local authorities and VCOs to emphasise the importance of business continuity during severe weather.

Lack of 'usable' information

Although guidance for the VCS is now emerging there is still a lack of local level information and advice about the impacts of climate change and how this will influence the health care and community services that vulnerable people rely on. Research into the needs and constraints of VCOs needs to be better understood if appropriate support can be provided. Local knowledge is essential for effective responses to severe weather and to build climate resilience. It is clear from recent experience in flooding events that working through community leaders and knowing who to talk to has been invaluable for service providers and emergency services.

Recommendations

- Support the voluntary and community sector to better understand and responds to the implications of a changing climate on service delivery and the lives of the vulnerable people they support (support through training/resources and commissioning criteria).
- Encourage greater coordination across the health and social care system to build solutions and recognise the VCS potential role in both representing the needs of, and reaching and strengthening vulnerable communities.

PART lll

Part lll provides the appendices to the report including complete survey responses, a more detailed sector description, case studies, tools and guidance and a list of abbreviations and their explanation.

Appendix 1 – Public Health Outcomes Framework (PHOF) Indicators

The PHOF sets out a number of indicators used locally and nationally to monitor progress towards improving the population's health. Some of the indicators relate directly or indirectly to adaptation. The possible effects are laid out in the table below.

PHOF Indicator (indicator number)	Effect Description	Adaptation Effect	National Average
3.06) proportion of NHS organisations with a sustainable development management plan	All areas of adaptation if approved and implemented. But only relates to NHS organisations	Heat waves, cold snaps, flooding, Air quality, natural environment	59%
1.16) Utilisation of outdoor space for exercise/health reasons	May influence the provision of outdoor green space which can reduce urban heat	Heat waves, flooding	15.3%
1.18) proportion of adult carers who have as much social contacts as they would like	Improve social connectedness may mean more people are able to access the help they need to protect themselves during periods of extreme weather or flooding	Heat waves, cold snaps, flooding,	41.3%
3.01) Fraction of mortality attributable to particulate air pollution	Improvements in air quality by reducing traffic, encouraging physical activity, increasing green space	Improve air quality	5.1%
2.13) Percentage of physically active adults	May influence the provision of outdoor green space which can reduce urban heat. Improvements in air quality by reducing traffic, encouraging physical activity, increasing green space	Heat waves, cold snaps, flooding, Air quality, natural environment	55.6%
4.15) Excess winter deaths	Reduce number of winder deaths associated with cold weather	Cold snaps	-
4.04) Under 75 mortality rate from cardiovascular disease 4.07) Under 75 mortality from respiratory disease	Respiratory and cardiovascular diseases are the main causes of illness and death during a heat wave; taking steps to reduce the harm from heat will contribute to improving mortality rates from cardiovascular	Heat waves, air quality	-
1.17) Percentage of households that experience fuel poverty.	Reduce number of people who can heat their house adequately	Cold snap	10.4%

Appendix 2 –Summary of relevant indicators

This appendix provides a summary of relevant indicators.

Heatwaves (Heatwave Plan for England)
Provision of green space for exercise/health reasons (PHOF indicator 1.16) can reduce urban heat. Improving social connectedness (PHOF indicator 1.18) may mean more people are able to access the help they need to protect themselves from severe heat. Respiratory and cardiovascular diseases are the main causes of illness and death during a heatwave; taking steps to reduce the harm from heat will contribute to improving mortality rates from cardiovascular (PHOF indicator 4.04) and respiratory diseases (PHOF indicator 4.07).

Cold weather (Cold Weather Plan for England)
Two PHOF outcome indicators are directly linked to reducing harm from cold: excess winter deaths (PHOF Indicator 4.15) and fuel poverty (PHOF Indicator 1.17), although up to 17 others can be linked to long-term planning for cold weather (see CWP Making the Case page 26).

Flooding (National Flood Emergency Framework)
Provision of green space for exercise/health reasons (PHOF indicator 1.16) could also reduce urban flooding. Improving social connectedness (PHOF indicator 1.18) may mean more people are able to access the help they need to prepare, respond and recover from flooding.

Air Pollution
Addressing air pollution from particulate matter (PHOF indicator 3.01) and encouraging physical activity (PHOF indicator 2.13) e.g. walking and cycling may improve air quality. This could reduce deaths associated with ground level ozone (PHOF Indicator 4.03) cardiovascular mortality (PHOF Indicator 4.04) and respiratory mortality (PHOF Indicator 4.07).

Natural environment
Time spent in the natural environment enhances health and wellbeing (PHOF Indicator 2.23). Increasing access to the natural environment may increase uptake of exercise in outdoor space, (PHOF Indicator 1.16) improve physical and mental health (PHOF Indicators 2.12, 2.13, 2.06) and reduce air pollution (PHOF Indicator 3.01).

National Adaptation Programme
The primary measures for assessing progress of the NAP health and wellbeing Objective 11 are summer mortality due to higher temperatures and summer morbidity due to higher temperatures. The primary measure for objective 12 is the PHOF indicator 3.06 - Percentage of public sector organisations with an SDMP that includes an adaptation component. This establishes the existence of a plan however does not rate the quality of the plan in addressing adaptation.

Social Care
Adult Social Care Outcomes Framework (ASCOF) is a tool to measure the extent to which people experience person-centred, co-ordinated care within the care and support system. Domain 1A

'Social care-related quality of life' incorporates a new measure of social isolation (PHOF Indicator 1.18) to improve social connectedness and may mean more people are able to access the help and information they need to protect themselves from the adverse effects of climate change.

NHS indicators

The NHS Outcomes framework partners the ASCOF providing a national overview of how well the NHS is performing and encouraging outcome focused behaviour. Overarching indicators of relevance to climate change adaptation are domain 1a) Potential years of life lost from causes considered amenable to health care and 1b) life expectancy at 75 years. The likelihood of increasing heatwaves and concerns of overheating in hospitals will come under domain 4 'Ensuring people have a positive experience of care' and domain 5 'treating and caring for people in a safe environment and protecting them from avoidable harm'.

NICE guidelines

NICE public health guidance 41 (Issued: November 2012) encourages people to walk or cycle for travel or recreation which would assist the public health goal of reducing air pollution and climate change. NICE public health guidance 32 (Issued: January 2011) highlights UV radiation (which can occur naturally via sunlight) as the leading cause of skin cancer and provides information and recommendations.

The National Planning Practice Guidance 2014 (NPPG) relates to provision of climate change, flooding and coastal change planning adaptation, mitigation and resilience alongside carbon reduction strategies. Health and healthcare infrastructure planning supports strong healthy communities and the encouragement of physical activity by providing open spaces.

A National Air Quality Strategy and a Local Air Quality Management framework aim to protect and enhance the urban and natural environment to improve public health and wellbeing. National emission totals are reported annually to the European Union (EU) and the United Nations (UN).

Appendix 3 – Sector Description

National Bodies

The new health and care system became fully operational from April 2013 to deliver the ambitions set out in the Health and Social Care Act. NHS England, PHE, the NHS TDA and Health Education England, assumed their full range of responsibilities.

DH's purpose is to help people live better for longer. The Department leads, shapes and funds health and care in England, making sure people have the support, care and treatment they need, with the compassion, respect and dignity they deserve.

The health and care system organisations work together with the Department to achieve this common purpose. The Department enables health and social care bodies to deliver services according to national priorities and works with other parts of government to achieve this. The Department sets objectives and budgets and holds the system to account on behalf of the Secretary of State for Health.

At a local level CCGs – made up of doctors, nurses and other professionals – were able to buy services for patients, while local councils took on their new role in promoting public health. HWBs bring together local organisations to work in partnership and Healthwatch provides a powerful voice for patients and local communities.

The key national bodies working together at a national level within the health and care system are:

NHS England supports NHS services nationally and ensures that money spent on NHS services provides the best possible care for patients by funding local clinical commissioning groups to commission services for their communities and ensures that they do this effectively.

PHE provides national leadership and expert services to support public health and works with local government, the NHS and other key partners to respond to health protection emergencies.

The NHS TDA supports NHS trusts to improve so they can take advantage of the benefits of foundation trust status when they are ready.

Health Education England makes sure the healthcare workforce has the right skills and training to improve the care patients receive by supporting a network of Local Education and Training Boards that plan education and training of the workforce to meet local and national needs.

NICE provides guidance to help health and social care professionals deliver the best possible care for patients based on the best available evidence.

NIHR and its clinical research networks form a health research system in which the NHS supports outstanding individuals, working in world class facilities, conducting leading edge research focused on the needs of patients and the public.

The Health and Social Care Information Centre supports the health and care system by collecting, analysing and publishing national data and statistical information and will deliver national IT systems and services to support health and care providers.

NHS Blood and Transplant manages the safe supply of blood to the NHS as well as organ donation and transplants across the UK.

The NHS Litigation Authority resolves fairly all claims made against its scheme members, helping the NHS to learn from them to improve patient safety.

The NHS Business Services Authority carries out a range of support services to the NHS, patients and the public, including payments for community pharmacists filling prescriptions and dentists carrying out NHS treatment.

The National Cross System Group for Sustainable Development across the health, public health and social care system in England is formed of high level representation from the breadth of the health and care system organisations to ensure an effective system-wide approach to sustainable development and includes the following organisations:

Care Quality Commission (CQC), Defra, Department of Energy and Climate Change (DECC), DH, Health Education England, Health and Social Care Information Centre (HSCIC), Involve, Kings Fund Living With Environmental Change (LWEC), LGA, Monitor, NICE, NHS Alliance, NHS Confederation, NHS England, NHS Property Services Ltd, NHS TDA, PHE, RCGP, Royal College of Nursing (RCN), Royal Pharmaceutical Society, Social Care Institute for Excellence (SCIE), HWBs.

Public Health England

NHS England

Appendix 4 – Summary of Evidence

This appendix provides a summary of information utilised and data collated from surveys sent out to various component parts of the healthcare system. The data is summarised in Part II of the report.

National Bodies

Below are the questions taken from the National Bodies survey:

Question Number	Question
1	How is your organisation developing its national leadership role in progressing sustainable development?
2	How could your organisation best contribute to progressing the Sustainable Development and Climate Change agenda?
3	How does your organisation support the partnership approach to this agenda?
4	Does your organisation have a current* Board-approved Sustainable Development Management Plan (SDMP)?
5	Is your organisation on track for an absolute carbon reduction target of 28% by 2020 on a 2013 baseline?
6	Do your board-approved plans address the potential need to adapt the delivery of health and care activities and organisation infrastructure as a result of climate change and adverse weather events?
7	Do your board-approved plans include routine monitoring of the impacts of climate change and adverse weather events on health and care?
8	Do your board-approved plans include a risk assessment of the results of climate change and adverse weather events?
9 i	Have you registered and completed the GCC version 3 assessment? (http://www.sduhealth.org.uk/gcc/)
9 ii	Has your organisation identified a governing body lead or executive lead for sustainable development?
10	Does your organisation embed sustainability in its decision making processes?

*A "current Board-approved" plan means all of the following are true:

- Approved by the board or governing body
- Within the time period covered by the plan e.g. plan for 5 years then within those five years.
- Update within the last 12 month to the board or governing body showing progress, or approving the plan.

Within the responses table below:

Y = Yes

N = No

NK = Not known

National Body	Question										
	1	2	3	4	5	6	7	8	9 i	9 ii	10
Health Education England ALB = Arm's Length Body	3 year national policy on Corporate Social Responsibility (agreed 2013, renewed 2014) which sets out role as leaders in; maintaining strong business ethics; managing environmental impact; promoting sustainability through procurement; encouraging staff to be active citizens; supporting local communities; working in partnership to influence the health & care sector	Emphasis on developing own staff, in line with the values of the NHS Constitution, as ambassadors for HEE, and through active consideration of sustainable development as a central part of our strategy for the future development of education and training of the health and care workforce.	Working as a national ALB with DH and other ALBs; working locally with the health & care sector through provider-led Local Education & Training Boards (LETBs) and through active membership of the national NHS Social Partnership Forum	Y	Y	Y	N	N	Y	Ian Cumming, Chief Executive	y
Monitor FT = Foundation Trust	Members of the National Cross System Steering Group	Dissemination of relevant info to FTs in monthly bulletin. Guidance for FTs on their Annual Reports encourages them to have board approved SDMPs and suggest they follow the HM Treasury Financial Reporting Manual (FrEM)	See Q1. Partly responsible for completing the last assessment against the Adaption Reporting Requirements	N	NK	N	N	N	N	Toby Lambert – Director of Strategy and Policy	Y
NHS Confed	Working with LGA on the healthy/ sustainable community agenda. Involved with World Economic Forum –on sustainability of healthcare systems. Led some specific initiatives, incl. partnership with GE for a finance pack for NHS orgs to fund low carbon combined chilling/heating and power (CCHP)	Range of internal policies and initiatives in place to develop sustainable approaches to business operations. Improvements in our office environment and energy usage with positive impact on carbon reduction	Worked with both the LGA and commercial partners to support this agenda	N	NK	N	N	N	N	N	Y
NHS England	Endorsed the national SDS and modules. Hosts the SDU with its system-wide Sustainable Development (SD) leadership role	Work underway to integrate SD objectives in direct commissioning of services. NHS standard contract includes SD and Climate Change.	With PHE, NHS England supports the Sustainable Development Unit and the system-wide partnership working.	N	N	N	N	N	N	N	Y

NHS Property Services	Appointed a National Lead for Sustainability in June, SDMP currently being written for Board Approval in January 2015	On National Cross System Group. Working with stakeholders e.g. NHS England to progress sustainability across organisations. Embedding SD in own organisation	Working with other agencies as detailed in Q2	N	NK	Y	N	Y	N	Y	Y
NHS Trust Development Authority	Monitoring of adherence via annual governance statements and annual business plans	Encourage NHS Trusts in developing 5 year plans to include progress towards sustainability in this context and planning for adverse weather events in business continuity terms	Y	N	NK	N	N	N	N	Yes Ralph Coulbeck	N
NICE	Conduct regular monitoring of energy, waste, recycling, water usage and travel modes. Figures are analysed and produced quarterly to the Greening Government Commitment Group lead by DH	Set up Green Group Committee in 2007 - internal group of key members with responsibility for SDMP and making all staff aware of the targets that need to be achieved	NICE Facilities attend the Green Government Commitment meetings once a month and bring back new initiatives and targets to NICE Green Group	Y	NK	N	N	N	N	Y	Y
PHE	First national body to have an approved SDMP. PHE gives advice and mentoring to other health and government bodies e.g. DECC, DCLG, and develops tools and offers advice on the health related hazards of climate change, e.g. the Heatwave Plan for England. Works with local authorities and other public health bodies in developing a network of SD professionals. PHE held a 2 day workshop in February 2014 to explore its role in the NAP and identify existing projects addressing climate change adaptation. PHE is a co-publisher of the SDS and its modules, and the support for the UN statement	Embedding the actions developed by our Sustainability Programme Board and implementing our SDMP. PHE recognises that all sectors have a core business role in adapting to a changing climate and recognise their actions will have an impact on the public's health and wellbeing. PHE has an active research programme into the health impacts of climate change contributing to Climate Change Risk Assessments and collaborating with external academic institutions	Actively engaged with other health and cross-government bodies on the various strands of sustainable development, sitting on the cross system Sustainable Development Board. 4 regional leads for sustainability and climate change adaptation who work in partnership with NHS England colleagues. Sustainability Programme Board, a Climate Change and Extreme Events Programme Board, and an Environmental Hazards Programme Board. Contributes to the DH NAP health and care system steering group	Y	Y	Y	Y	Y	N	Yes Professor Paul Cosford	Y

Public Health England

NHS England

Good Corporate Citizenship (GCC) Tool

Below are the questions taken from the adaptation element of the GCC Tool:

Question Set	Level	Question	
Planning and Performance	Getting Started	1	We identify and understand the current risks and vulnerabilities to our service and patients/clients/users and staff associated with local climate change impacts.
		2	We engage with local stakeholders in identifying risks posed by current weather and climate. We review them regularly using a recognised tool (e.g. LCLIP, BACLIAT, Adaption Wizard etc.).
		3	We develop plans, which are part of our Sustainable Development Management Plan and link to the Emergency Preparedness, Resilience and Response planning programme.
	Getting There	1	We have a comprehensive adaptation plan that we monitor regularly.
		2	We work closely with leads in sustainability, finance, estates management, emergency preparedness/planning, business continuity and local stakeholders to ensure a coordinated approach to adaptation. We consider current and future policy and legislation in our plans (e.g. Heat wave plan, cold weather plan and flood response).
		3	We communicate our adaptation plans and how they tie into our Sustainable Development Management Plans as well as the Emergency Preparedness, Resilience & Response plans.
	Excellent	1	We set a leading example of adaptation planning for our communities, verified by external assessment. We have identified and understood the future risks and vulnerabilities to our communities, services and vulnerable groups associated with local climate change impacts.
		2	We encourage innovation and support new technologies that help improve our performance.
		3	We anticipate the impacts of future policy and legislation and position ourselves to maximise benefits to our organisation and to our community.
Risk Assessment	Getting Started	1	We utilise existing climate impact risk assessment tools relevant to identifying current risks to our geographical area.
		2	We consider our ability to cope with rising temperatures and heat waves, flooding and storm events, cold weather spells, increased pollution and increased UV sunlight exposure and other projected events that may disrupt 'normal' service.
		3	We discuss climate change implications with local stakeholders and encourage early planning requirements for the local area.
	Getting There	1	We incorporate the impact assessment in our organisational risk register.
		2	We formulate plans to manage the risks whilst managing carbon reductions and our impact on the environment.
		3	We share these plans with our staff and communities.
	Excellent	1	We have an integrated risk management process across

			Sustainable Development, Emergency Preparedness and Business Continuity to consider key climate and weather risks.
		2	We have a joint plan of action that is signed off at board level. This plan is shared with local stakeholders and forms the basis of publicly accountable planning and preparations.
		3	We share our ideas and learning with other organisations. Our progress and our ability to cope with risk is verified by external assessment.
Infrastructure	Getting Started	1	We review the risks to the estate/building stock and supporting infrastructure including roads, utilities, suppliers and telecommunications.
		2	We consider our ability to cope with rising temperatures and heat waves, flooding and storm events, cold weather spells, increased pollution and increased UV sunlight exposure. We have identified cool spots for use during heat waves.
		3	We understand if any key infrastructure or key access routes are located in flood risk areas and therefore liable to flooding. If so we have contingency plans and alternative routes are known to relevant staff.
	Getting There	1	We develop action plans based on our risk assessments. The plan is embedded in our organisational processes and reviewed on a yearly basis. The plan is communicated to staff and communities as appropriate.
		2	We consider how best to enhance green space in and around our facilities, to help manage surface water drainage and cope with rising temperatures and heat waves in relation to infrastructure.
		3	When we refurbish existing estate or build new developments we follow adaptation plans and guidance, to ensure they are future proof.
	Excellent	1	We lead by example and ensure our plans fit into the local system planning structures.
		2	We work with the local health and wellbeing board and other local authority colleagues to ensure that adaptation is a key part of the local planning process.
		3	External verification confirms that all appropriate measures are being taken.
Resource Use, Scarcity and Continuity	Getting Started	1	We identify the nature and extent of our key resources (e.g. medical gas supply, vaccines) and other critical supplies.
		2	We review the potential fluctuations in access to water, energy, fuel, food and other key resources.
		3	We consider our ability to cope with rising temperatures and heat waves, flooding and storm events, cold weather spells, increased pollution and increased UV sunlight exposure in relation to our supply of core resources.
	Getting There	1	We develop plans to reduce and use our resources more effectively.
		2	We ensure continuity and resilience of supply and review our plans on a regular basis.
		3	We are aware of how resource scarcity may impact our communities, patients and staff/users and clients, and plan accordingly.

	Excellent	1	We are a leading exemplar in our management of business continuity and resilience planning.
		2	We test our plans on a yearly basis, for instance through the major incident planning process.
		3	We monitor the carbon effects of our plans and make sure they contribute to an overall reduction in emissions.
Workforce and Service Delivery	Getting Started	1	We review the risks to workforce and service delivery including training requirements, changes to disease patterns, and changes to the health needs of the population.
		2	We consider our ability to cope with rising temperatures and heat waves, flooding and storm events, cold weather spells, increased pollution and increased UV sunlight exposure.
		3	We consider the training requirements for staff, and develop guidance where appropriate.
	Getting There	1	We develop plans to ensure that our workforce is prepared and trained to deal with different scenarios and these are reviewed on a regular basis.
		2	We plan our future workforce requirements based on changing disease patterns and providing resilient, sustainable services.
		3	We ensure that workforce provision allows all essential services to continue in the event of major and extreme events (i.e. staff can continue to get to users in the community in the event of extreme weather events).
	Excellent	1	We are a leading exemplar in our management of major and extreme events and have incorporated the impacts of climate change into the scenarios utilised for testing our plans.
		2	We work with our partners and stakeholders to plan resilient services which are flexible and appropriate for patterns of disease.
		3	We can demonstrate that our plans are robust and will stand the test of time.
Social and Community Impacts	Getting Started	1	We review the risks to our communities and model the impacts to vulnerable people and services.
		2	We engage with local communities in identifying these risks.
		3	We agree actions to take forward, including cost benefit analysis, across the system and within organisations.
	Getting There	1	We create plans that reduce impact on and ensure continuation of care for the most vulnerable groups in society (such as the elderly) during heat waves, floods and other extreme weather events.
		2	We consider the effects of resource supply fluctuations, migration and mental health on vulnerable communities and develop plans to minimise the impacts.
		3	We work in partnership with local authority, local care providers, the voluntary sector and other community service providers to minimise these impacts and provide care for the most vulnerable in the community.
	Excellent	1	We are a leading exemplar in championing support to vulnerable people and are building our capacity and capability to manage this in a harmonised manner.
		2	We build local resilience structures and capability which support

			health and wellbeing in local communities.
		3	We are known to others for our transparency and involvement of communities in our work on adaptation to climate change.

Below are the results taken from the adaptation section of the GCC Tool:

Question Set	Level	Question	% Yes - Providers	% Yes - Commissioners
Planning and Performance	Getting Started	1	84	59
		2	46	28
		3	59	53
	Getting There	1	33	19
		2	59	59
		3	43	25
	Excellent	1	11	0
		2	44	44
		3	38	28
Risk Assessment	Getting Started	1	53	38
		2	77	81
		3	48	50
	Getting There	1	42	28
		2	47	25
		3	32	19
	Excellent	1	37	47
		2	25	28
		3	20	25
Infrastructure	Getting Started	1	77	56
		2	63	50
		3	63	63
	Getting There	1	54	38
		2	42	16
		3	57	16
	Excellent	1	34	13
		2	30	31
		3	16	13
Resource Use, Scarcity and Continuity	Getting Started	1	76	38
		2	73	28
		3	68	50
	Getting There	1	66	34
		2	67	47
		3	56	47
	Excellent	1	28	22
		2	62	38
		3	25	0
Workforce and Service Delivery	Getting Started	1	61	66
		2	75	69
		3	67	59
	Getting There	1	66	47
		2	41	19
		3	68	59

	Excellent	1	20	13
		2	42	47
		3	30	25
Social and Community Impacts	Getting Started	1	59	56
		2	61	53
		3	47	34
	Getting There	1	66	66
		2	43	41
		3	53	69
	Excellent	1	25	22
		2	23	28
		3	13	6

NHS Providers and CCGs

Based on the 2014 SDMP survey, 36% of NHS organisations (providers and CCGs) had a governing body or board approved SDMP in place by 31st March 2014. The figure in 2013 was higher (74%) as it preceded the major structural changes across the health sector.

NHS Trusts and CCGs:

Organisation type	Percent Yes
Providers	38%
CCGs	18%
Overall	29%

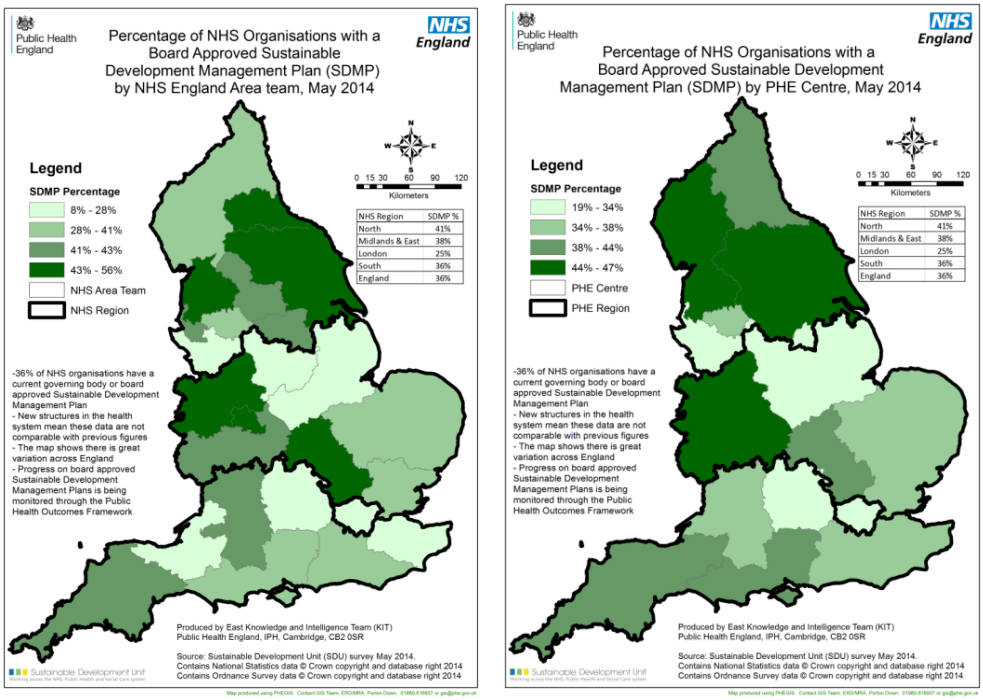


Figure 1.5 – Percentage of organisation with a board-approved SDMP by NHS England Area Team (left) and PHE centre (right).

The ERIC (Estates Return Information Collection) return is the main central data collection for estates and facilities services from the NHS. In April 2014, of the providers who reported, 143 (57%) confirmed that they had a board approved adaptation plan.

03	Board approved Adaptation Plan	Yes/No	Select YES if Adaptation Plans exist and have been approved by the Board. The plan will take into account an acknowledgement by the organisation of the risks presented by climate change to the continued functioning and performance of their healthcare service provision and will be in line with the NHS Operating Framework, NHS Contracts and NHS SDU Adaptation Guidance as part of Sustainable Development Management Plans (SDMPs) http://www.sdu.nhs.uk/publications-resources/108/Adaptation-to-Climate-Change-for-Health-and-Social-Care-organisations/, Plans should be based on the UK Climate Projections 2009 http://ukclimateprojections.defra.gov.uk/ and draw on relevant national and local evidence. Advice and support is available from the NHS SDU, email info@sdu.nhs.uk and the Environment Agency's Climate Ready Support Service http://www.environment-agency.gov.uk/research/137557.aspx - http://www.sdu.nhs.uk/corporate-requirements/legal-requirements/adaptation.aspx

General Practice and Dentistry

General Practice

Question 1: I am confident that the main practice I work in has plans in place to enable it to be resilient in the face of adverse weather events such as flooding, heatwaves or power cuts.

Answer choices	Responses	
Strongly Agree	17.78%	8
Tend to agree	31.11%	14
Neither agree nor disagree	6.67%	3
Tend to disagree	35.56%	16
Strongly disagree	8.89%	4
Total respondents: 45		

Question 2: I am confident that the local CCG or Health Board I work in has plans in place to enable it to be resilient in the face of adverse weather events such as flooding, heatwaves or power cuts.

Answer choices	Responses	
Strongly Agree	2.17%	1
Tend to agree	17.39%	8
Neither agree nor disagree	26.09%	12
Tend to disagree	30.43%	14
Strongly disagree	26.09%	12
Total respondents: 46		

Question 3: I am confident that the local NHS England Area Team I work in has plans in place to enable local practices' care to be resilient in the face of adverse weather events such as flooding, heatwaves or power cuts.

Answer choices	Responses	
Strongly Agree	2.13%	1
Tend to agree	10.64%	5
Neither agree nor disagree	21.28%	10
Tend to disagree	23.40%	11
Strongly disagree	29.79%	14
I don't practise in England	14.89%	7
Total respondents: 47		

Question 4: I am confident that the local Department of Public Health has plans in place to enable local practices to be resilient in the face of adverse weather events such as flooding, heatwaves or power cuts.

Answer choices	Responses	
Strongly Agree	0.00%	0
Tend to agree	13.04%	6
Neither agree nor disagree	30.43%	14
Tend to disagree	36.96%	17
Strongly disagree	23.91%	11
Total respondents: 46		

Dentistry

Responses from Clinical Directors (or similar) of a Community Dental Service (or similar)

Question 1: I am confident that within dentistry in my area the risks to providing dental care from a changing climate and adverse weather events are assessed within the organisation.

Answer choices	Responses	
Strongly Agree	19.35%	6
Agree	38.71%	12
Neither agree nor disagree	9.68%	3
Disagree	16.13%	5
Strongly disagree	6.45%	2
Don't know	9.68%	3
Total respondents: 31		

Question 2: I am confident that local plans have been put in place within the organisation to minimise the negative impacts to dental care from a changing climate and extreme weather events.

Answer choices	Responses	
Strongly Agree	16.13%	5
Agree	48.39%	15
Neither agree nor disagree	12.90%	4
Disagree	9.68%	3
Strongly disagree	6.45%	2
Don't know	6.45%	2
Total respondents: 31		

Question 3: I am confident that the impact of a changing climate and adverse weather events on dental care locally is being monitored within the organisation.

Answer choices	Responses	
Strongly Agree	6.90%	2
Agree	37.93%	11
Neither agree nor disagree	10.34%	3
Disagree	27.59	8
Strongly disagree	6.90%	2
Don't know	10.34%	3
Total respondents: 29		

Responses from Commissioners of Dental Services

Question 1: I am confident that within dentistry in my area the risks to providing dental care from a changing climate and adverse weather events are assessed by dental providers.

Answer choices	Responses	
Strongly Agree	0%	0
Agree	33.33%	1
Neither agree nor disagree	0%	0
Disagree	66.67%	2
Strongly disagree	0%	0
Don't know	0%	0
Total respondents: 3		

Question 2: I am confident that within dentistry in my area the risks to providing dental care from a changing climate and adverse weather events are assessed by NHS England .

Answer choices	Responses	
Strongly Agree	0%	0
Agree	33.33%	1
Neither agree nor disagree	33.33%	1
Disagree	33.33%	1
Strongly disagree	0%	0
Don't know	0%	0
Total respondents: 3		

Question 3: I am confident that local plans are in place by dental providers to minimise the negative impacts to dental care from a changing climate and extreme weather events.

Answer choices	Responses	
Strongly Agree	0%	0
Agree	0%	0
Neither agree nor disagree	33.33%	1
Disagree	66.67%	2
Strongly disagree	0%	0
Total respondents: 3		

Responses from Consultants in dental public health

Question 1: I am confident that within dentistry in my PHE area the risks to providing dental care from a changing climate and adverse weather events are assessed by local dental providers.

Answer choices	Responses	
Strongly Agree	0%	0
Agree	6.25%	1
Neither agree nor disagree	12.50%	2
Disagree	43.75%	7
Strongly disagree	25%	4
Don't know	12.50	2
Total respondents: 16		

Question 2: I am confident that within dentistry in my PHE area the risks to providing dental care from a changing climate and adverse weather events are assessed by PHE.

Answer choices	Responses	
Strongly Agree	6.25%	1
Agree	0%	0
Neither agree nor disagree	25%	4
Disagree	31.25%	5
Strongly disagree	31.25%	5
Don't know	6.25%	1
Total respondents: 16		

Question 3: I am confident that plans are in place with local dental services to minimise the negative impacts to dental care from a changing climate and extreme weather events.

Answer choices	Responses	
Strongly Agree	0%	0
Agree	25%	4
Neither agree nor disagree	6.25%	1
Disagree	50%	8
Strongly disagree	18.75%	3
Don't know	0%	0
Total respondents: 16		

Question 4: I am confident that local plans are in place by PHE to minismise the negative impacts to dental care from a changing climate and extreme weather events.

Answer choices	Responses	
Strongly Agree	6.67%	1
Agree	0%	0
Neither agree nor disagree	20%	3
Disagree	46.67%	7
Strongly disagree	20%	3
Don't know	6.67%	1
Total respondents: 15		

Question 5: I am confident that the impact of a changing climate and adverse weather events on dental care is being monitored by PHE.

Answer choices	Responses	
Strongly Agree	6.25%	1
Agree	6.25%	1
Neither agree nor disagree	6.25%	1
Disagree	37.50%	6
Strongly disagree	31.25%	5
Don't know	12.50%	2
Total respondents: 16		

Health and Wellbeing Boards

It is unclear how much work HWBs are undertaking in regard to the adaptation agenda because this is often included within other priorities and here are no specific measures of their activity. Proxy measures which may indicate activity levels include:

1. LGA maps for HWB priorities
2. Climate Local
3. HWB survey results

1. **The Local Government Association (LGA)** have produced a map showing the priorities for all the 151 HWBs in England: http://www.local.gov.uk/health-and-wellbeing-boards/-/journal_content/56/10180/6111055/ARTICLE

This analysis grouped the HWB's priorities into 30 topic areas, some of which are linked directly or indirectly to adaptation:

Priorities	Proportion of HWBBs with the topic as a priority (%)
1) Building safe, sustainable communities (direct link)	28
2) Health inequalities (indirect – reducing health inequalities will reduce people's vulnerability to the effects of climate change)	40
3) Respiratory disease (Air quality)	4
4) Supporting vulnerable citizens (reduce people's vulnerability to the effects of climate change)	24
5) Supporting an ageing population	23
6) Wider determinants of health and wellbeing (general wellbeing and community improvement)	26

2. Climate Local

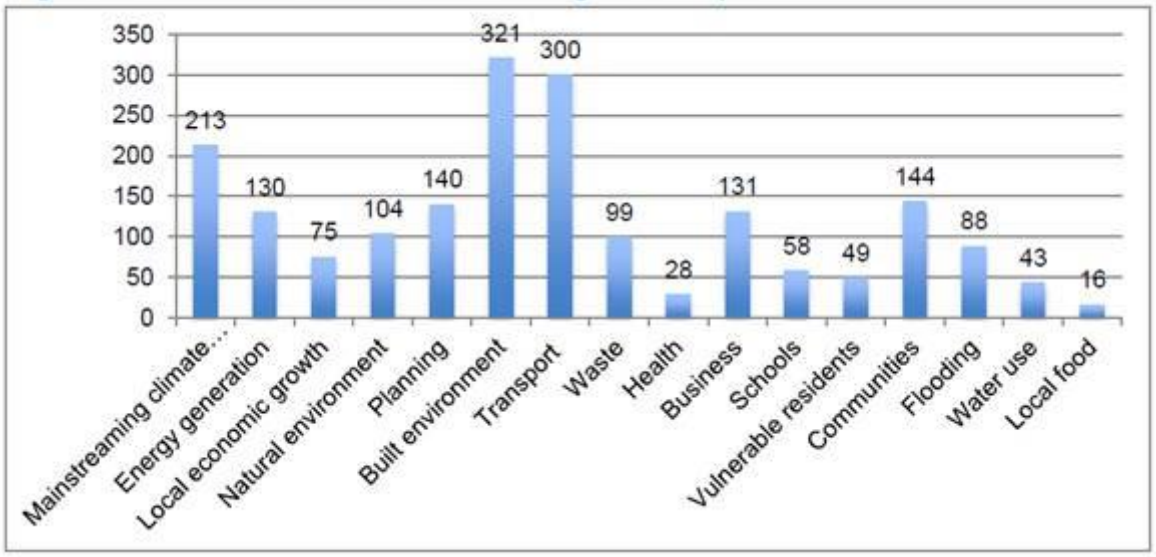
An LGA initiative supported by the Environment Agency's Climate Ready service, to encourage councils to reduce carbon emissions and increase resilience in response to a changing climate. Councils voluntarily signing up to Climate Local are required to produce an action plan outlining commitments and actions they will undertake.

Climate Local reviewed 47 local climate action plans covering 64 local authorities that have signed up to the initiative. In terms of the number of actions that local authorities planned to carry out the majority (1087 out of 1542 (74.8%)) were under the overarching theme of carbon reduction. Only 27% of actions (391 out of 1542) focused on adaptation. Further analysis of emerging themes grouped the actions according to 16 different topics. The most common topics covered by the actions were the built environment, transport and mainstreaming climate change, whilst water use, health and local food were the least common topics.

Many other actions had an implicit or indirect link to health outcomes e.g. fuel poverty, sustainable models of transport (including active transport), flooding (mental health), and tree planning (improvements in air quality). There was no evidence in the report that these actions are being linked to health strategies or JSNAs.

http://www.local.gov.uk/documents/10180/49938/Analysis+of+Climate+Local+Actions+FINAL.pdf/56d48b4f-3d2b-4759-90ce-32c5cf04c83a

Figure 3.5 Total number of actions contributing to each topic



PHE is developing capacity within the local public health workforce and those in spatial planning, housing, and transport planning to maximise the impact of health and wellbeing through their work. There is a recognised role which HWBs could contribute to the debate on future housing needs and requirements taking into account climate change projections with support from local public health teams. The additional challenges posed by climate change highlight the need for proper long term strategic housing reviews at the local level.

3. HWB Survey Results

The SDU and the Environment Agency developed a short set of questions for HWBs to assess three major elements of their adaptation plans; risk assessment, adaptation planning and impact and evaluation of the negative effects of climate change on health and wellbeing locally. The survey was sent to the chairs of the 150 HWBs within England and given three weeks in which to respond.

Twenty nine boards (19%) responded to the voluntary survey, which is a low response. The results are likely to represent responses from HWB who are working on this agenda and hence inevitably skew the answers more positively. On average over two thirds of the boards that responded, answered positively to the assessment of their adaptation plans. Of that responded 69% were confident that they have risk assessments in place around the effects of climate change and extreme weather events on health and wellbeing. There was agreement or strongly agreement from 62% that there are local plans in place to address the negative impacts of climate change on HWBs responded confidently 65% of the time that the impacts of climate change on health and wellbeing are being monitored locally.

Assessment of the survey responses suggests some encouraging results around the level of assessment and impact evaluation in place locally. Many of the boards reported having a cross system approach with local partnerships around resilience and emergency planning, as well as adapting services to climate change and extreme weather events. In some cases local monitoring of the impacts of climate change is demonstrated through annual reporting and the PHOF, as well as regular statistical reporting. There is a possibility of positive skewing among the survey results, demonstrated by the richness and variation of comments received. However it was very clear that despite the variation in comments and approaches there was no suggestion that the subject of adaptation to climate change is not an important issue that needs to be addressed.

HWB Survey Questions

Question 1: Your Board are confident that risks and opportunities to health and wellbeing from a changing climate and extreme weather events are assessed (e.g. risk assessments such as JSNA).

Answer choices	Responses	
Strongly agree	28%	8
Tend to agree	41%	12
Neither agree nor disagree	21%	6
Tend to disagree	3%	1
Strongly disagree	7%	2
Total	100%	29

Question 2: Your Board are confident that local plans are in place to address the negative impacts to health and wellbeing as a result of the changing climate and extreme weather events (e.g. your local health and wellbeing strategy).

Answer choices	Responses	
Strongly agree	17%	5
Tend to agree	45%	13
Neither agree nor disagree	34%	10
Tend to disagree	3%	1
Strongly disagree	0%	0
Total	100%	29

Question 3: Your board are confident that the impacts to health and wellbeing as a result of climate change and extreme weather events are being monitored locally (e.g. monitoring by local public health teams).

Answer choices	Responses	
Strongly agree	31%	9
Tend to agree	34%	10
Neither agree nor disagree	31%	9
Tend to disagree	3%	1
Strongly disagree	0%	0
Total	100%	29

Appendix 5 – Case Studies

NHS Blood and Transplant Authority

The Business Continuity Institute European Awards 2013, Most Effective Recovery of the Year award went to NHS Blood and Transplant, operators of one of the largest blood manufacturing centres in the world at Filton near Bristol. This is an excellent example of a National Body response to adaptation and climate change. In Sept 2012, following intense prolonged rainfall the centre was flooded and closed, but a remarkable recovery operation involving staff at all levels saw it back in business within a week, with virtually no disruption to patients. The recovery involved implementation of the business continuity plans, along with a well-rehearsed command structure and a detailed logistics plan to maintain distribution to customers, so avoiding the potential for massive life threatening impacts on patients across the whole of the NHS.

PHE National Adaptation Plan Workshop

A workshop and seminar was held in February 2014 to share, learn, and discuss public health work in climate change. The first workshop was internal to PHE and the second external workshop involved partners from Defra, EA Climate Ready, DH, academia, and non-governmental organisations. Adaptation requires an iterative balance between short-term priorities and long-term gains, which is often a challenge. Participants shared examples of good adaptation planning and practices at the local, regional and national level and identified gaps requiring further action. Ways to facilitate effective planning and implementation of adaptation actions at multiple levels were also identified. The workshop was an opportunity for PHE to share information and ideas using a simple framework for discussions around the NAP. There are many projects underway within PHE that already have a component of adaptation to climate change and these projects should join efforts with others to respond to emerging risks and be seen as opportunities to respond to one of the biggest global public health threats this century.

Putting Sustainability into practice: Actions for a healthy and sustainable society

NHS England and PHE collaborated in October 2014 as the South Regional Sustainability Network to organise a seminar bringing together NHS, public health and social care leaders and sustainability champions to discuss and share best practice and inspire work across organisations that will deliver the vision and goals of the Sustainable Development Strategy.

Workshop themes focused on:

- Considering what responses are necessary to enable the health and social care system to adapt to both the direct pathological impacts and indirect impacts on logistics, supply and business continuity in a changing climate.
- A systematic county-wide approach to sustainability through Joint Strategic Needs Assessments, using examples of pragmatic steps that can be taken to embed sustainability in local actions
- Gaining knowledge on sustainable strategies for commissioning and the procurement process.
- Measurement and modelling of health service carbon emissions to reduce travel, energy and influence procurement within an organisation using carbon reduction too

Overheating

Prof. Short's EPSRC, DH and NIHR funded research group's broadcast quality film 'Robust Hospitals in a Changing Climate' has won the 2013 tv/e Global Sustainability Film Award at BAFTA. You can see it at:

http://sms.cam.ac.uk/media/1559781

The research project 'Design and Delivery of Robust Hospital Environments in a Changing Climate' seeks to understand the environmental performance of the current NHS Estate and, from this, to establish its resilience. To this end, hospital buildings operated by four NHS Trusts are being monitored and simulated using dynamic thermal models calibrated against measured data. Adaptive refurbishment options are proposed and their relative performance predicted against the existing internal conditions, energy demands and CO2 emissions.

This paper presents findings relating to one representative type building, a medium-rise ward block dating from the late 1960s. It shows that this particular type may have more resilience in the current climate than might have been expected, that it will remain resilient into the 2030s, and that relatively non-invasive measures would extend and increase its resilience whilst saving energy.

Pitt review

What can we learn from the flooding of hospitals and surrounding area in 2007 – The Pitt Review: Lessons learned from the 2007 floods. In particular this put in place a number of mechanisms for reducing future risks and impacts.

Aligned approach between commissioners and providers

London Climate Change Partnership - Health and Social Care Risk Assessment and Action Plan http://climatelondon.org.uk/publications/in-sickness-and-in-health/. This details the risks, actions and key messages for resilience in London.

North East Essex CCG

The CCG is working with the local authorities and other partners on an adaption plan, as detailed in their SDMP. All seven CCGs in Essex have agreed to pool resources to create a small team to manage emergency preparedness, resilience and response on their behalf. The team will ensure that CCGs and providers of health care have plans in place to deal with emergencies and to ensure that normal service delivery ("business continuity") is maintained. The joint Business Impact Analysis Process can be found here:

http://www.neessexccg.nhs.uk/library_uploads/files/essex_ccg_business_impact_analysis_v1_0.pdf

The team will also work with other agencies such as the emergency services and local authorities to develop and test multi-agency response plans.

Gloucestershire CCG

Gloucestershire CCG is working with the Local Resilience Forum (LRF) Gloucestershire and has produced an Extreme Weather Plan. Further information on the LRF work is available here:

http://glosprepared.co.uk/about-us/plans-and-planning/

Bedfordshire CCG

The CCG has an exemplary sustainability and adaptation risk register that is updated annually and signed off by the Risk Management Group.

Harrogate and Rural District CCG

A surge and escalation plan is to be implemented which reports to the System Resilience Group (formally the Urgent Care Working Group) which deals with system resilience across the health economy during times of pressures such as winter, heatwaves etc.

The Voluntary Sector

The 2006 Stern Review on the Economics of Climate Change prompted Baring Foundation to fund four projects in 2008 to work with different parts of the non-environmental voluntary sector The aim was to help existing experts on poverty, children, refugees and so on to realise how their work would be profoundly affected (Baring, 2013). Each project developed tailored materials and approaches to demonstrate the need for adaptation for the organisations they were working with to meeting the needs of beneficiaries and planning future services. Baring concluded that such organisations have important roles to play in providing services, identifying new needs, planning for emergency responses, engaging people on issues such as behaviour change and influencing policy.

In 2009, the Joseph Rowntree Foundation initiated a number of projects to investigate the social implications of climate change[84]. This continuing work seeks to ensure that people or places facing poverty and disadvantage are not disproportionately affected by climate change, or by policy or practice responses to it and supporting the development of fair responses to climate change among policymakers, practitioners and communities undertaking mitigation and adaptation activity at a national and local level. With the creation of the Third Sector Task force on Climate Change[85] in the same year there seemed to be a growing and dynamic group of UK voluntary organisations responding to climate change from a social justice perspective and creating new collaborations between academia, policy and practitioners.

Since 2010, however, the change in government and the cuts caused by the economic recession has resulted in a significant reduction in activity. Many of the leading organisations were forced to undergo strategic reviews and climate adaptation was seen as 'non-essential' and easy to cut. Much of the remaining work is currently focussed on emergency response rather than longer term preparedness although the work of community resilience development organisations e.g. the Transition Towns movement (https://www.transitionnetwork.org/) continues to build small-scale food, transport energy and housing initiatives to demonstrate alternative approaches that challenge the way mainstream society is currently dealing with climate change and peak oil.

Fuel poverty, cold homes and energy efficiency are also 'live' policy issues. These cross cutting issues span, for example, environment, health and housing sectors and connect to climate change mitigation and adaptation. Initiatives such as the Energy Bill Revolution (www.energybillrevolution.org) have a focus on fuel poverty and energy efficiency in the health sector and work directly with health decision makers in the voluntary and community sector.

[84] For more information about the work of the JRF see: http://www.jrf.org.uk/topic/climate-change-and-communities

[85] Launched in May 2009 to raise the profile of climate change in the third sector http://www.birmingham.ac.uk/generic/tsrc/research/environment/third-sector-task-force-report-climate-change.aspx

The Baring Foundation Projects

The Big Response, National Council of Voluntary Organisations, Global Action Plan and Green Alliance working with organisations that support vulnerable people. These included British Red Cross, Equinox Care, Friends of the Elderly and the Royal National Institute of Blind People.
Towards Climate Smart Children and Youth Organisations, National Children's Bureau and the Institute of Development Studies working with children and youth organisations including the Pre-School Learning Alliance, Action for Children and the National Youth Agency.
Shared Energy, bassac, New Economics Foundation, Community Development Foundation, Community Sector Coalition and Groundwork working with nine community anchor organisations.
The "Climate Refugee" roundtable Climate Outreach and Information Network (COIN) working closely with five refugee and human rights organisations, the International Secretariat of Amnesty International, the Refugee Council, Refugee Action, Asylum Aid and Praxis, and having wider engagement with a further 29 other refugee and human rights organisations.

The Joseph Rowntree Foundation (JRF) Climate Just project[86]
JRF supports the development of fair responses to climate change among policymakers, practitioners and communities undertaking mitigation and adaptation at a national and local level. In 2014 it launched a new website and mapping tool, Climate Just, to support local authorities and their partners in health, social care and the voluntary sector to take account of social vulnerability and disadvantage among communities when they respond to climate change. JRF is working with Climate UK to support cross sector local engagement on this agenda.

[86] Climate just website launched in 2014: http://www.climatejust.org.uk/

Appendix 6 – Tools and Guidance

This appendix provides a collection of resources, tools and guidance for use across the health sector.

General tools for the health sector

WHO Europe – Spreadsheet to Estimate Economic Costs "*Climate change and health: a tool to estimate health and adaptation costs*"
Sustainable Development Strategy for the Health, Public Health and Social Care System 2014-2020
National Heatwave and Cold Weather Plans for England
SDU Adaptation planning guidance
GCC assessment model
UKCIP adaptation wizard
UKCIP climate projections
National Air Quality Strategy and a Local Air Quality Management framework
Met office weather alerts

Overarching System Approach

Local Climate Impacts Profile
Reducing urban heat risk
National Indicator 188: Adapting to climate change
Health Building Note (HBN) 00-07
National Adaptation Programme as part of the PHE Sustainability Programme Delivery Plan
Health Building Note 00-07 'Planning for a resilient healthcare estate'
Flood risk information
SHAPE Tool
Managing Climate Risks to Well-being and the Economy Adaptation Sub-Committee
ISO 22301:2012 Business Continuity Management Systems
Business Continuity Institute Good Practice Guide 2013
BS 11200 Crisis Management – Guidance and Good Practice
Health chapter included in the building planners guide in the National Planning Practice Guidance 2014 (NPPG)
Civil Contingencies Act (2004)

National Bodies

NHS England Emergency Preparedness, Resilience and Response (EPRR)
NHS England Business Continuity resources including the Business Continuity toolkit

Providers

BIOPICC Toolkit
Premises Assurance Model (PAM)
Resilience planning for NHS facilities

Climate Change Adaptation Report - National Ambulance Document by GrEAN (Green Environmental Ambulance Network)
Joint Emergency Services Interoperability protocol

Health and Wellbeing Boards

Climate Ready Research and workshops with Health and Wellbeing Boards
Joint Strategic Needs Assessment: A Guide to Integrating Sustainability produced by Kent County Council in 2013 provides guidance on how to consider sustainability in the development of JSNAs and therefore future Joint Health and Wellbeing Strategies
The Environment Agency Climate Ready in collaboration with partners have produced 'Under the Weather', a toolkit to assist Health and Wellbeing Boards in integrating climate change adaptation into the local health economy.
Local Resilience Forums
Healthy, sustainable and resilient communities

Voluntary Sector

Many of the UKCIP tools are adaptable for decision support and adaptation planning e.g. BACLIAT, Adaptation Wizard, LClip. There are also the tools that came out of the Baring Foundation work e.g. Climate Smart tool and materials, Shared Energy toolkit and the NEF, Global Action Plan and NCVO engagement materials [I will provide links]. Also social justice specific adaptation tools available e.g. Climate Just or Liveable and Just (Australian tool)

Appendix 7 – Abbreviations

Acronym	Explanation
ARP	Adaptation Reporting Power
ASC	Adaptation Sub Committee
ASCOF	Adult Social Care Outcomes Framework
ALB	Arm's Length Body
AACE	Association of Ambulance Chief Executives
BDA	British Dental Association
BMA	British Medical Association
BCMS	Business Continuity Management System
CRMP	Carbon Reduction Management Plan
CQC	Care Quality Commission
CC	Climate Change
CCAct	Climate Change Act 2008
CCRA	Climate Change Risk Assessments
CCG	Clinical Commissioning Group
CCA	Civil Contingencies Act 2004
CSU	Commissioning Support Unit
CCC	Committee on Climate Change
DCLG	Department for Communities and Local Government
Defra	Department for Environment, Food and Rural Affairs
DECC	Department of Energy and Climate Change
DH	Department of Health
DeDeRHECC	Design and Delivery of Robust Hospital Environments in a Changing Climate
EPRR	Emergency Preparedness, Resilience and Response
EU	European Union
ERIC	Estates Return Information Collection
FrEM	Financial Reporting Manual
FT	Foundation Trust
GIS	Geographical Information System
GP	General Practitioner
GCC	Good Corporate Citizenship
GrEAN	Green Environmental Ambulance Service
HSE	Health and Safety Executive
HSCIC	Health and Social Care Information Centre
HWB	Health and Wellbeing Board
HEE	Health Education England
NPRU	Health Protection Research Unit
IPCC	Intergovernmental Panel on Climate Change
JESIP	Joint Emergency Services Interoperability Programme
JHWS	Joint Health and Wellbeing Strategy
JSNA	Joint Strategic Needs Assessment
JRF	Joseph Rowntree Foundation
LWEC	Living With Environmental Change
LGA	Local Government Association
LRF	Local Resilience Forum
NAP	National Adaptation Programme
NCS	National Capabilities Survey
NCVO	National Council of Voluntary Organisations

NCSG	National Cross System Group
NHS	National Health Service
NICE	National Institute of Health and Care Excellence
NIHR	National Institute of Health Research
NRR	National Risk Register
NHS PAM	NHS Premises Assurance Model
NHS TDA	NHS Trust Development Authority
PHASE	Public Health Adaptation Strategies to Extreme Weather Events
PHE	Public Health England
PHOF	Public Health Outcomes Framework
RCGP	Royal College of General Practitioners
RCN	Royal College of Nursing
SCIE	Social Care Institute for Excellence
SHAPE	Strategic Health Asset Planning and Evaluation
SD	Sustainable Development
SDMP	Sustainable Development Management Plan
SDS	Sustainable Development Strategy
SDU	Sustainable Development Unit
UKCP09	UK Climate Projections
UN	United Nations
VCS	Voluntary and Community Sector
VCO	Voluntary and Community sector Organisation