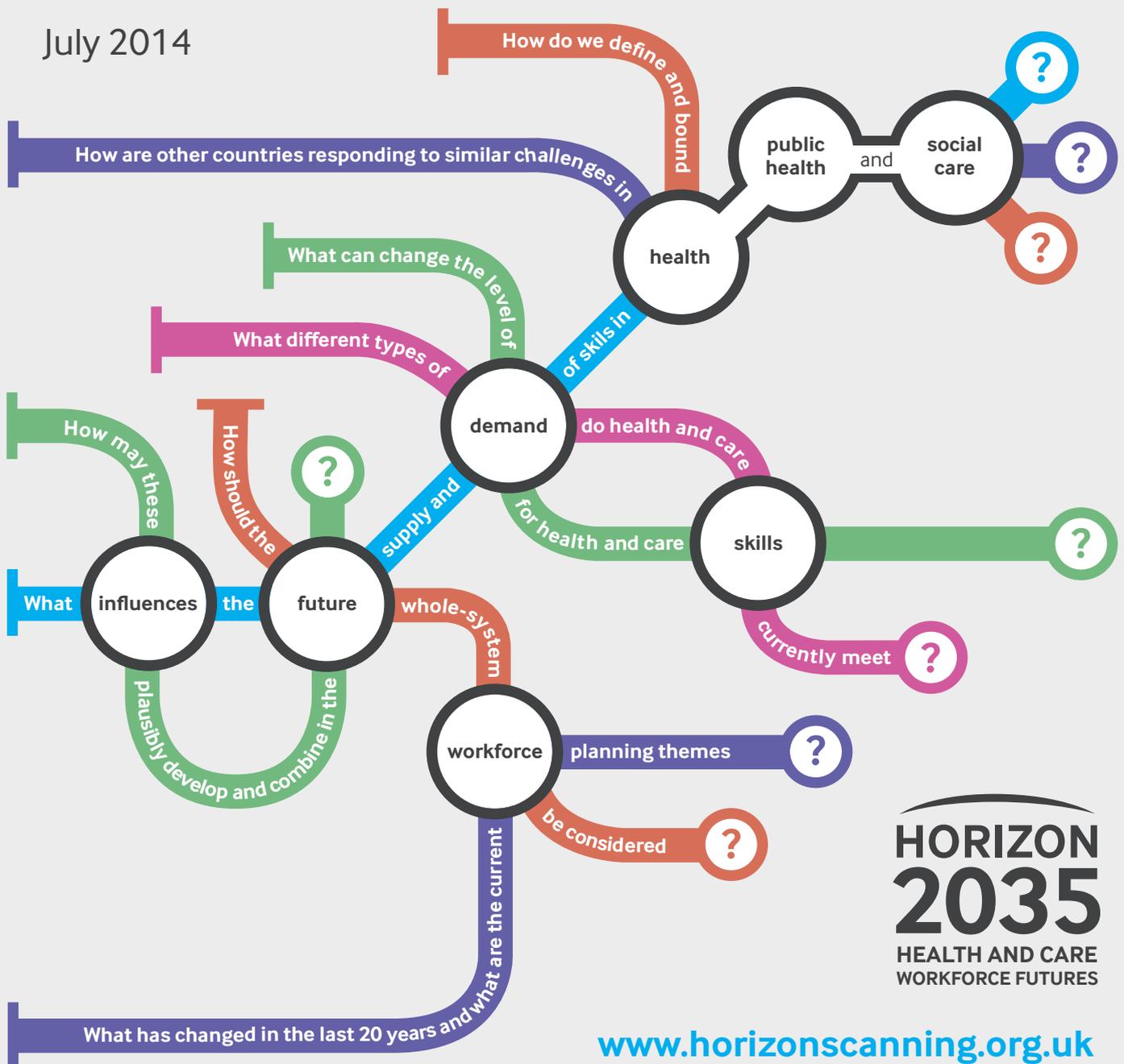


Horizon 2035: Health and care workforce futures Progress update

July 2014



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HORIZON
2035
HEALTH AND CARE
WORKFORCE FUTURES



CENTRE
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INTELLIGENCE

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1 Introduction



Purpose of the programme

Horizon scanning to support the Department of Health's long-term strategic vision for the health, social care and public health workforce in England.

The NHS reached its 65th anniversary in 2013 and our health and care system is arguably facing its most testing period yet. In *Big Picture challenges: the context*, the CfWI Horizon Scanning team outlined the most significant themes shaping this system (CfWI 2013).

In order to prepare for these long-term challenges, we collectively need to think beyond typical planning cycles. An increasing number of health and care planning initiatives, such as the Dilnot Commission on Funding Care and Support and NHS England's 'Call to Action' (NHS England 2013), have started to address this longer-term view.

These initiatives, however, do not specifically consider the demand and supply of the healthcare, social care and public health workforce together and this is where the Horizon 2035 programme plays a part.



Horizon scanning

'A systematic examination of information to identify potential threats, risks, emerging issues and opportunities [...] allowing for better preparedness.' (UK Government 2014, p28)

When it comes to trying to balance the demand and supply for skills in health and care, the stakes are high. For example, by 2025 the number of social care jobs needed to meet demand is projected to grow by up to one million (Skills for Care 2013), while in *Shape of the Medical Workforce* we reported that under 'business as usual' conditions, there would be a 60% increase in hospital consultants by 2020, possibly exceeding demand (CfWI 2012).

Horizon 2035 considers how challenges across health and care may unfold over the next 20-years in terms of demand and supply of skills, and what actions can be taken now to be ready for these challenges ahead.

The Department of Health and the CfWI

The Department of Health's role is to act as "the steward of the health and care system to ensure that it operates effectively as a whole to meet the needs of people and communities" (DH 2013). Through Horizon 2035, the CfWI is supporting the Department by providing intelligence at the overall health and care system level using innovative workforce analysis and modelling.

Horizon 2035 deploys the CfWI Robust Workforce Planning framework (RWPF; see www.cfwi.org.uk/how-we-work); a proven approach to consider workforces and wider systems over the long term. The RWPF combines horizon scanning, systems thinking, modelling and scenario planning to enable robust policy analysis (for full details see CfWI 2014a).

Work areas so far

There have been three main areas of work so far. The first; **defining the health and care system** (pages 4-5), considers the context of the workforce sectors; their size, structure and how they can be understood together. Here we have considered:

- How do we define and bound this system?
- What has changed in the last 20 years in this system and what are the current workforce planning themes?
- How should the future workforce be considered?

The second; **generating scenarios** (pages 6-7), identifies the crucial forces shaping the current and future workforce system in order to generate consistent future scenarios. These exercises have considered:

- What influences the future demand and supply for health, social care and public health?
- How may these influences plausibly develop and combine in the future?
- How are other countries responding to similar challenges in health and care?

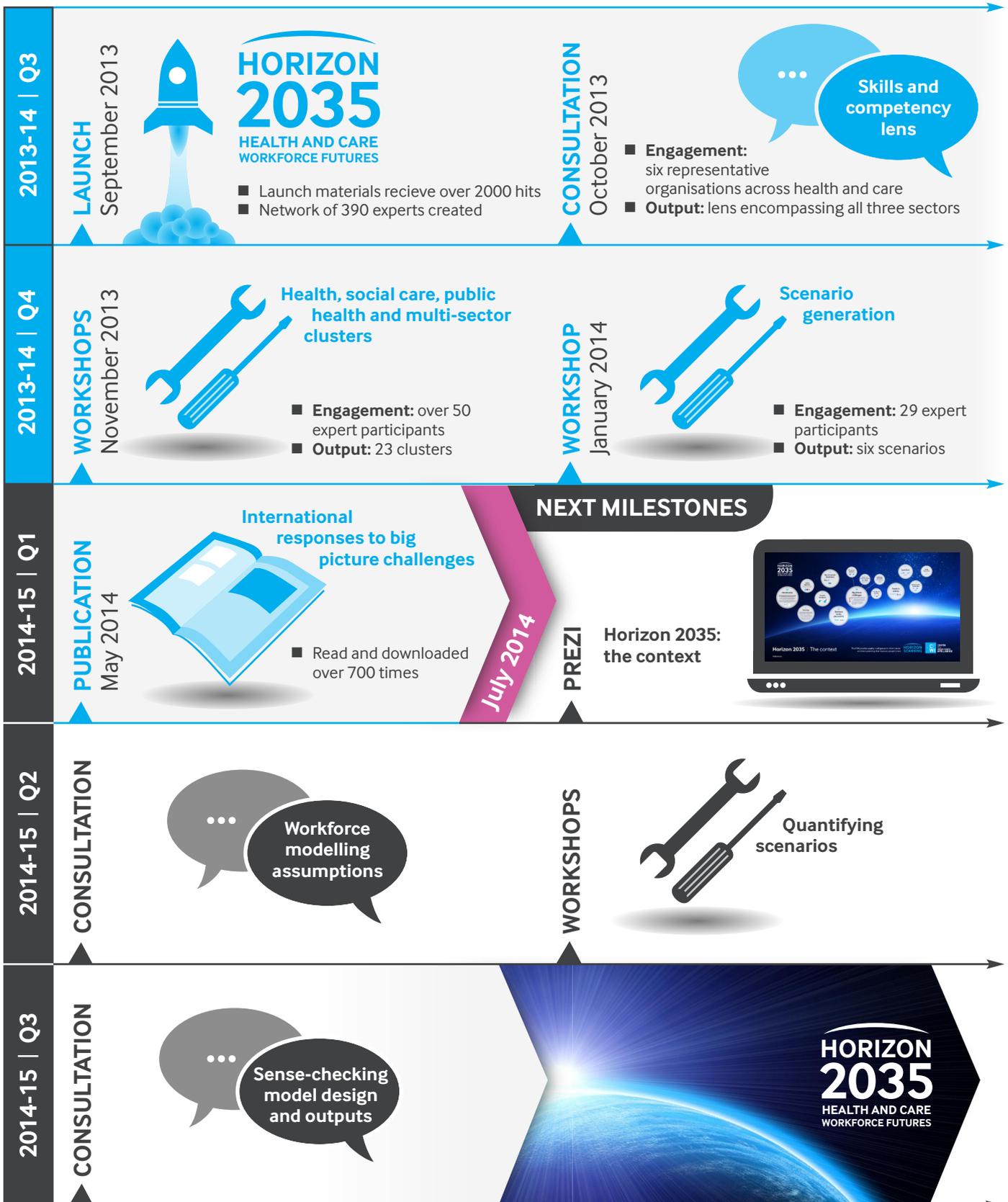
The final area of work; **modelling demand and supply** (pages 8-9), quantifies the current demand and supply of the health, social care and public health workforce and then considers the quantitative implications of the scenarios. So far we have considered:

- What is the purpose of modelling in Horizon 2035?
- What different types of demand do health and care skills currently meet?
- What can change the level demand for health and care skills?

This report

This report illustrates the progress made in each of these work areas and the next steps in the Horizon 2035 programme. The timeline, right, shows the milestones we have reached since autumn 2013.

Figure 1: Horizon 2035 timeline: milestones and impact



2 Defining the health and care system

How do we define and bound this system?

In Horizon 2035 we are applying a broad definition of health, social care and public health in England to reflect the Department of Health's wide role as 'the steward of the health and care system to ensure that it operates effectively as a whole to meet the needs of people and communities' (DH 2013).



The health and care system workforce

'For Horizon 2035, this includes public and private healthcare, adult social care and public health medicine in England.'

To mirror the Department's responsibility, we therefore include the publicly and privately funded adult social care workforce recorded by Skills for Care and the publicly and privately employed health and public health workforce registered by professional bodies or reported by the Health and Social Care Information Centre. We also want to recognise the significant contribution of the voluntary and unpaid care sector identified in the ONS census and UK Citizenship Survey; and the role of private healthcare which accounts for 17% of UK healthcare spend (ONS 2013), and the workforce this represents.

While facilitation and leadership roles; such as those in estates, IT, and scientific research play a key role in service delivery; these are out of scope for Horizon 2035 as the CfWI does not perform research into support roles. Figure 2 (right) shows the overall composition of the health, social care and public health workforce that we are considering for Horizon 2035.

We are currently liaising with representatives from these workforces to ensure they are quantified accurately.

What has changed in the last 20 years and what are the current workforce planning themes?

Horizon 2035: the context (CfWI 2014) sets the scene for the health, social care and public health workforce. This work helps to frame questions such as; which skills might we demand more than others, and what long-term service transformations are currently underway?

In the last 20 years the total population of England rose by 11% from 48 million to 53 million, but, as illustrated in the chart (right), the over-65 population rose

15% and the over-80 population grew by 37% (ONS 2014).

Over a similar period, the total number of jobs within the health and care system grew from 2.4 million in 1996 to 3.4 million in 2013 (ONS 2013b). This was, in part, driven by increases in real-terms public funding; in healthcare from £43.5 billion in 1994-95 to £102.2 billion in 2011-12 (House of Commons Library 2012); and in social care from £6.6 billion in 1994-95 to £14.3 billion in 2011-12 (HSCIC 2013).

However, different workforce groups did not grow at the same rate. For example between 1995 and 2012, the number of doctors increased by over 60% while the number of nurses, midwives and health visitors increased by 23% (HSCIC 2006 and 2013b).

Key legislative changes over this period include the growing independence of health and social care providers through the granting of foundation trust status. A forthcoming *Horizon 2035: The Context* Prezi will provide further information on this.

How should the future whole-system workforce be considered?

Taking a whole system approach to the health, social care and public health sectors presents a particular challenge. This approach requires the research and modelling to capture these three diverse sectors, and the people represented, together within a single framework.

The long timeframe of 20 years presents a different challenge; that our current conceptions of roles and responsibilities in health and care services may not be applicable over a long timescale. Therefore a different understanding may be required.

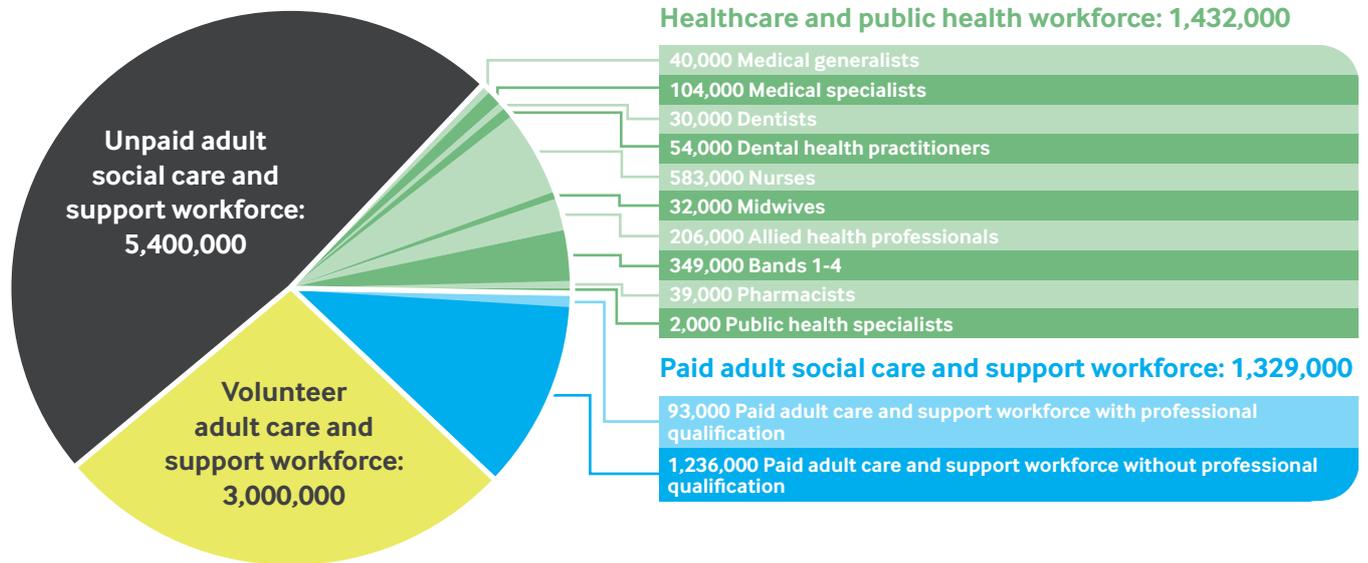
To overcome both the challenge of the whole-system approach and the long timeframe of the research, we have developed a 'skills and competency lens' that is applicable to all three sectors and consistent over a longer timescale. To develop this approach

we have liaised with sector experts including Skills for Care, Skills for Health and NHS Employers.

This lens (right) recognises competence in these sectors as a complex combination of an individual's skills, personal attributes and knowledge and this lens has been applied throughout Horizon 2035. Our focus so far has been on the eight 'wellbeing skills' as these relate most directly to service capacity and capability and these are what we are modelling.

This approach ensures that the work programme does not simply work forward from a base of current workforce groups, but rather works back from service user needs in terms of the skills required to meet them.

Figure 2: The Horizon 2035 workforce system (headcount)



With a headcount of over 11 million people, this system represents one in five of England's total population. Figure 2 shows how the unpaid and voluntary care and support workforces account for around 75% of this total headcount. We expect there to be some double counting between these unpaid and volunteer groups and the paid workforces. For data sources, see References, Figure 2

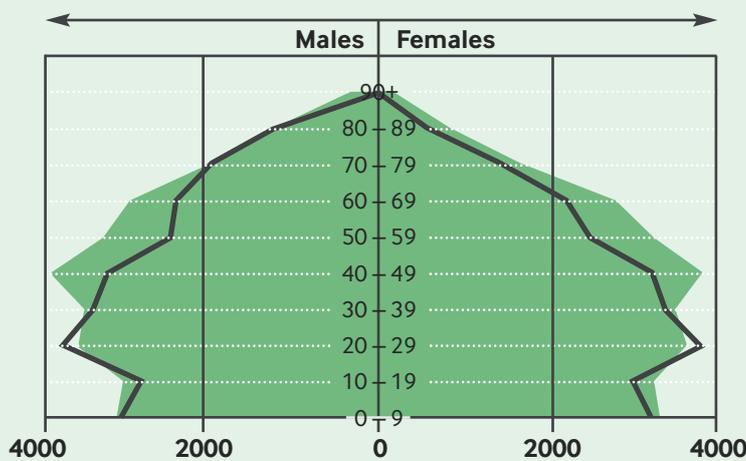


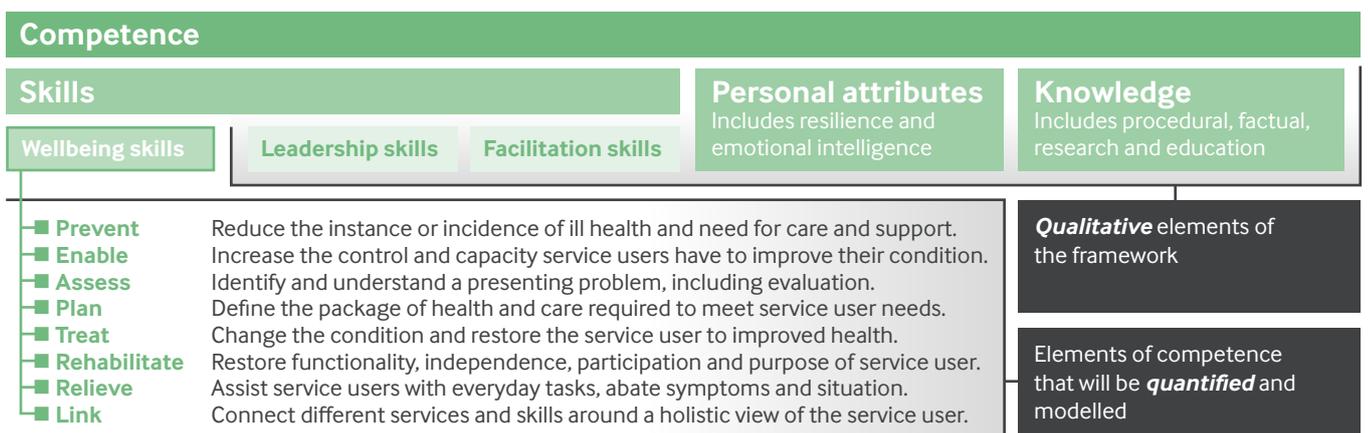
Figure 3: Changes in the last 20 years - England's population by age 1992 to 2012 (thousands)

The chart (left) illustrates how, over the last 20 years, England's population has aged. There have been significant increases in the numbers of males and females over 40.

1992
2012

Source: Office for National Statistics 2014

Figure 4: Horizon 2035 skills and competency lens



3 Generating scenarios

What influences the future demand and supply of skills in health, social care and public health?

Answering this question required a rigorous assessment of the contextual environment for workforce planning.

This was achieved firstly through synthesising all past CfWI horizon scanning and scenario generation work. This identified over 100 unique system 'factors'. Secondly, we engaged sector experts in four workshops to investigate how these factors are connected, a sample output from these sessions is shown in figure 5.

The four workshops, held in November 2013, addressed healthcare, public health, social care and the whole system individually. These attracted over 50 expert attendees. The purpose of the workshops was to consider groups of factors and how they link in a 'cluster' and affect change in each other. Overall, 23 clusters were generated, and the plausible outcomes over the 20-year timeframe were established for each.

The causal loop diagram (figure 5, right) shows cause and effect in a sample cluster 'Innovation and technology' from the healthcare workshop. An outcome of this cluster is displayed inside showing how clusters can resolve in particular ways.

>50 Sector experts and representatives consulted

The CfWI analysis of these clusters identified 29 key factors that were most impactful and recurrent across clusters. These could be considered the main influences for the future of health, public health and social care.



Factor

'System quantities or qualities which can change over time, linked through cause and effect relationships and can change the system' (CfWI 2014c)

Cluster

'A coherently defined set of system factors linked through cause and effect relationships that describe an aspect of the key focal issue of concern' (CfWI 2014c)

How may these influences plausibly develop and combine in the future?

Having identified the most important influences on the whole workforce system, potential futures could be created by considering how these influences plausibly combine together to create scenarios.

29 Expert participants in the scenario generation workshop

Again, this required the input of sector experts to further prioritise the 29 most important system factors, consider the direction they might take over 20 years, and combine these outcomes to create scenarios. This was done in a scenario generation workshop held in January 2014 involving sector experts and representatives from across the health, social care and public health sectors.

The four scenario dimensions chosen from the 29 most important factors by the expert participants were: the economy; technology; workforce flexibility and self-care.

Six scenarios were constructed using different, plausible directions and combinations of the four dimensions and these configurations are shown in the diagram, right.



Scenario

'A description of a possible future situation including the paths of development that may lead to it' (CfWI 2014c)

These scenarios and their narratives are owned by the stakeholders who attended on the day. They are expressed in their own terms and we are currently considering the implications of these futures.

Common workforce themes emerging from the scenarios include modifying skill mixes, changing responsibilities around demand management, and the changing role of the private sector.

How are other countries responding to similar challenges in health and care?

Our recent publication *Horizon 2035: International responses to big picture challenges* provides context to these scenarios and the later policy and planning stages of Horizon 2035.

The research considers how six other countries; Australia, Germany, Japan, The Netherlands, Sweden and the USA, are responding to similar challenges in health, social care and public health, and what the workforce implications are.

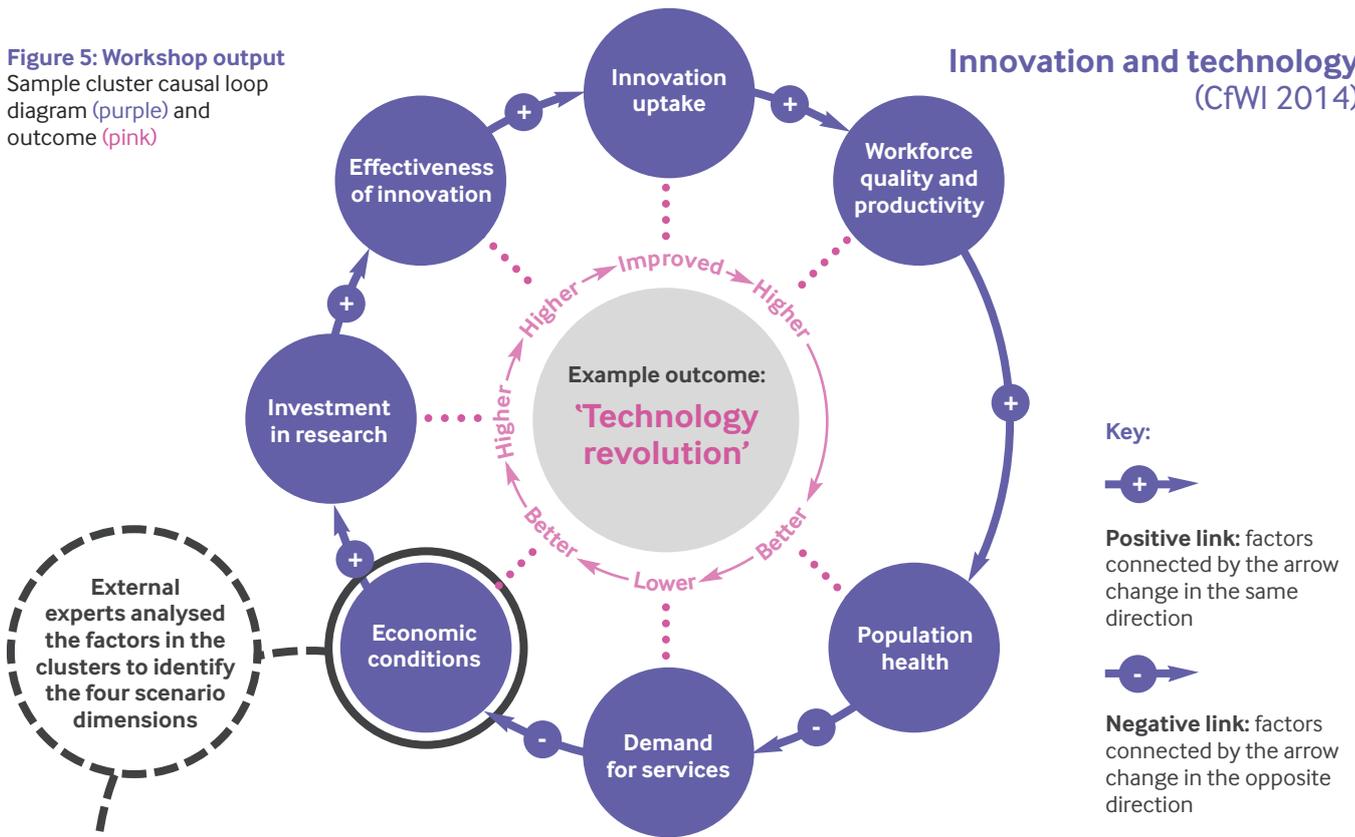
The 28 case studies span a range of decision-making levels from national

28 International workforce case studies

policy through to ways of working in individual teams and they are organised by our Big Picture Challenge categories (CfWI 2013). An example relating to the scenario dimensions is shown right, for further details please see *Horizon 2035: International responses to big picture challenges* (CfWI 2014d).

Figure 5: Workshop output
Sample cluster causal loop diagram (purple) and outcome (pink)

Innovation and technology
(CfWI 2014)



Economy	Technology	Workforce flexibility	Self-care	The 6 Horizon 2035 scenarios
Steady growth	Rapid adoption	High	High	'Win-win'
		High	High	'Enterprising service users'
Stagnation	Slow adoption	Low	Low	'The professionals'
		High	High	'Inequality pervades'
International examples provide context to the scenarios		Low	Low	'Workforce adapts to stagnation'
		Low	Low	'Safety-net services'



Big Picture Challenge: Uncertainty about how investment in life science, health and care will support the UK economy

International response: USA – Health science funding uncertainty: Following an election in late 2012 and spending cuts through sequestration in 2013, there has been uncertainty around short- and medium-term health science funding in the USA (Nature, 2012 and 2013). Government expenditure on the National Institute of Health (NIH), a principle source of funding for

health research, has been reduced by \$1.5 billion (Nature Medicine, 2013). Hearings at the US Senate examined concerns for the future health of US citizens, the advancement of health research, and the fate of scientists working in the US (American Association for Cancer Research, 2013).

4 Modelling demand and supply

What is the purpose of modelling in Horizon 2035?

Modelling the demand and supply of skills in health and care is central to the Horizon 2035 programme. It allows for the quantification of future scenarios, enhancing the evidence base for present day decision-making.

Our work so far has concentrated on the demand for skills. The aim of the demand modelling is to quantify the future level of need for the skills outlined on page 5. As with all modelling, the utility of the Horizon 2035 models depends upon the quality of the information and assumptions that have gone into it. Some of those assumptions are presented here and in the diagram, right.

Figure 6 (right) provides a conceptual overview of our demand modelling process only. We are currently testing and validating

these steps and once complete the results will be shared in future publications.



Workforce modelling

'The purpose of workforce modelling is to project demand and supply for a range of plausible futures, as described by the scenarios. Further modelling is then conducted to determine the robustness of policy options for achieving a sustainable balance of demand and supply.' (CfWI 2014c)

What different types of demand do health and care skills currently meet?

The first step in the demand modelling process (as illustrated, right) is to quantitatively capture current workforce activity within a common framework by applying the 'skills and competency lens' described on page 5. Activity in each workforce group is mapped to create a profile of 'wellbeing skills' for the group.

The mapping process draws on both documentary evidence including codes of practice and job descriptions, and review from expert workforce representatives to verify the assumptions made.

This profile consists of the eight wellbeing skills and also 'skill levels'; recognising concentration of skills, the value of experience and limits to skill expansion. This is shown in figure 6, right. The outcome is a picture of full time activity for the entire health and care workforce according to a common currency of skills.

The second step (right) is to assign this picture of current skill activity to high-level categories of service user needs in health and care. The seven demand categories we have identified originate from CfWI analysis of a range of sources and these categories are provided in the diagram, right. Preliminary analysis

identified that physical long term conditions, including frailty due to ageing, are the largest source of demand for skills in health and care.

This second mapping process draws firstly on activity data such as community care client type data (HSCIC 2013c) and also review from expert workforce representatives in order to verify these assumptions.

The outcome is a rich picture of the volume of workforce activity across different types of demand in health and care and the skills currently deployed to meet these demands.

What can change the level demand for health and care skills?

The third step (right) of the demand modelling process bridges this activity by skill and by type of demand with underlying determinants of demand.

We have approached this by considering that the volume of demand in these categories relates to an incidence of ill-health or care and support needs. The ability of health and care services to mitigate demand, for example how early intervention or self-care could mitigate demand 'up-stream', are also considered here.

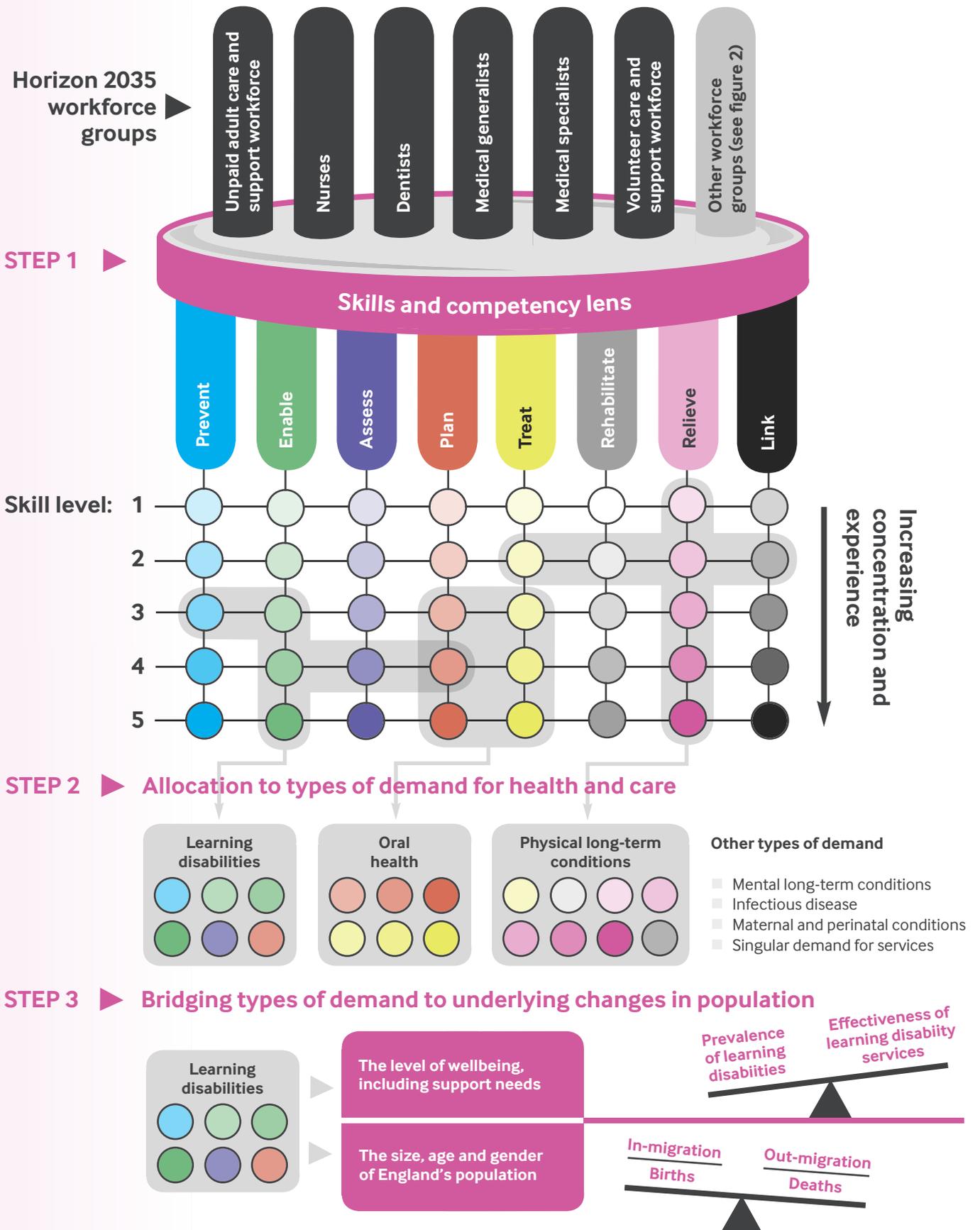
We have then considered that this incidence of ill-health and care and support needs stems from a combination of prevalence by population and the size and shape of the population in England. The model therefore links the categories of demand to the size

and shape of the England population by applying a prevalence profile of wellbeing to the population by age and gender. This process has drawn on a range of evidence including prevalence rates of long-term conditions and also service activity by population segments.

The final underlying determinant is the changing size and shape of the population itself, taking into account modifiers such as fertility rates and migration. This changing size and shape derives from the Office for National Statistics population projections (ONS 2013d).

All of these underlying determinants have the potential to change and in the model these drive further changes in demand for skills.

Figure 6: Horizon 2035 demand modelling: steps taken so far



5 Next steps

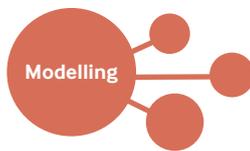
Over the remainder of 2014-2015 we will be working in the following areas to answer the questions below:

Modelling demand and supply



What different types of demand do health and care skills meet?

Continuing the exercise outlined on page 8, and working with sector experts, we are validating the definitions in the model, including the workforce groups, skills and types of demand. This is a consultation exercise involving skills and workforce representatives from the health and care sectors.



What is the current picture of supply of skills?

In parallel to the work around the demand for health and care skills, we are developing a model to describe the supply of skills across health and care. This work includes developing the supply model specification and design, and identifying datasets to inform the model.

Quantifying the future



What is the baseline case for future demand and supply of health and care skills?

For demand and supply, we are developing 'principle projections' quantifying demand and supply of skills through to 2035 under baseline conditions. This is involving secondary research into key data sets, SHELF (Oakley et al., 2010) research sessions with experts to elicit expected future values for uncertain parameters and finally testing and validating the 'principle projection' model outputs.



How do the scenarios impact demand and supply for skills and competencies?

This combines the scenario generation and modelling areas of work. We will run the model with data, repeating across the range of scenarios and also incorporate the qualified implications of the scenario exercise and qualitative elements of the skills and competency lens. This section will require further sense-checking and evaluation including a sensitivity analysis.

Planning for scenarios

Thematic analysis				
A	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
B	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
C	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

What are the consistent themes and gaps in demand and supply across the scenarios?

Robust policies or decisions can be considered as those that 'perform reasonably well compared to the alternatives across a wide range of plausible scenarios' (Lempert, et al., 2003). This process will therefore consider whether the implications of the scenarios raise common concerns for workforce planning. Policies that address these common concerns are more likely to be robust.

Policy analysis		1	2	3
		A	<input checked="" type="radio"/>	<input type="radio"/>
B	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	
C	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	

What workforce planning decisions can be taken now to mitigate concerns raised by the scenarios?

This final area of work will identify policies to be tested and decide the measures of effectiveness for judging their impact. Testing and evaluating policies will also require calculating and considering the level of uncertainty, identifying vulnerabilities and trade-offs and ultimately making recommendations to workforce planners in this whole system.

These steps follow the CfWI Robust Workforce Planning (RWP) framework. For more information please see CfWI 2014.

Appendix

Organisations contributing to Horizon 2035 so far

- British Medical Association
- Care Quality Commission
- CareTech Community Services
- Council of Deans of Health
- Hampshire County Council
- Haringey Learning Disability Partnership
- Health and Social Care Information Centre
- Health Education England
- Health-e-Futures
- Institute of Vocational Learning & Workforce Research
- Buckinghamshire New University
- Kent Community Health NHS Trust
- Macmillan Cancer Support
- Middlesex University Business School
- National Centre for Learning & Development
- National Institute of Health Research
- NHS Employers
- Northern, Eastern & Western Devon Clinical Commissioning Group
- PatientView
- Phillips
- Queen Margaret University Edinburgh
- Skills for Care
- Skills for Health
- Stonewall
- The College of Social Work
- The King's Fund
- The National Skills Academy for Social Care
- The UK Commission for Employment and Skills
- Turning Point Learning Disability Services
- United Kingdom Homecare Association Ltd
- Universities UK
- University of Oxford

References

- American Association for Cancer Research** (2013) *Senate appropriations subcommittee convenes hearing on NIH budget* [online] Available at: <http://aacr.informz.net/informzdataservice/onlineversion/public?mailingInstancelid=3286846> [accessed June 2014].
- Centre for Workforce Intelligence** (2012) *Shape of the Medical Workforce Starting the debate on the future consultant workforce* [online] Available at: www.cfw.org.uk/publications/leaders-report-shape-of-the-medical-workforce [accessed June 2014].
- Centre for Workforce Intelligence** (2013) *Big Picture Challenges: the context* [online] Available at: www.horizonscanning.org.uk/publications/big-picture-challenges/ [accessed June 2014].
- Centre for Workforce Intelligence** (2014a) *Developing robust system-dynamics-based workforce models: A best-practice approach* [online] Available at: www.cfw.org.uk/publications/developing-robust-system-dynamics-based-workforce-models-a-best-practice-guide [accessed June 2014].
- Centre for Workforce Intelligence** (2014b) *Context Prezi – Web deliverable to be sent to the DH at around the same time as this report.*
- Centre for Workforce Intelligence** (2014c) *Horizon scanning: Analysis of forces and factors* [online] Available at: www.cfw.org.uk/publications/horizon-scanning-analysis-of-forces-and-factors [accessed June 2014].
- Centre for Workforce Intelligence** (2014d) *Horizon 2035 International responses to big picture challenges* [online] Available at: www.cfw.org.uk/publications/horizon-2035-international-responses-to-big-picture-challenges [accessed June 2014].
- Department of Health** (2013) *Helping people live better for longer A guide to the Department of Health's role and purpose post-April 2013* [online] Available at: www.gov.uk/government/uploads/system/uploads/attachment_data/file/226838/DH_Brochure_WEB.pdf [accessed June 2014].
- Health and Social Care Information Centre** (2006) *NHS Staff – 1995-2005, Overview* [online] Available at: www.hscic.gov.uk/searchcatalogue?productid=2009&topics=2%2fWorkforce%2fStaff+numbers%2fAll+NHS+staff&sort=Relevance&size=10&page=2#top [accessed June 2014].
- Health and Social Care Information Centre** (2013) *Personal Social Services: Expenditure and Unit Costs – England, 2011-12, Final Release* [online] Available at: www.hscic.gov.uk/searchcatalogue?productid=10667&topics=1%2fSocial+care%2fSocial+care+expenditure&sort=Relevance&size=10&page=1#top [accessed June 2014].
- Health and Social Care Information Centre** (2013b) *NHS Workforce, Summary of staff in the NHS: Results from September 2012 census* [online] Available at: www.hscic.gov.uk/searchcatalogue?productid=11215&topics=0%2fWorkforce&sort=Relevance&size=10&page=2#top [accessed June 2014].
- Health and Social Care Information Centre** (2013c) *Community Care Statistics, Social Services Activity, England – 2012-13, Final release* [online] Available at: www.hscic.gov.uk/catalogue/PUB13148 [accessed June 2014].
- Health and Social Care Information Centre** (2014) *NHS Workforce Statistics – February 2014, Provisional statistics* [online] Available at: www.hscic.gov.uk/catalogue/PUB14102 [accessed June 2014].
- Health and Social Care Information Centre** (2014a) *NHS Hospital and Community Health Service (HCHS) Workforce Statistics in England, Non-medical staff – 2003-2013, As at 30 September* [online] Available at: www.hscic.gov.uk/searchcatalogue?productid=14385&topics=2%2fWorkforce%2fStaff+numbers%2fNon-medical+staff&sort=Relevance&size=10&page=1#top [accessed June 2014].
- Health and Social Care Information Centre** (2014b) *NHS Hospital and Community Health Service (HCHS) Workforce Statistics in England, Medical and Dental staff – 2003-2013, as at 30 September* [online] Available at: www.hscic.gov.uk/searchcatalogue?productid=14384&topics=2%2fWorkforce%2fStaff+numbers%2fHospital+and+community+health+service+staff&sort=Relevance&size=10&page=1#top [accessed June 2014].
- Health and Care Professions Council** (2014) *Number of registrants in regulated professions* [online] Available at: www.hcpc-uk.org/aboutregistration/professions/index.asp [accessed February 2014].
- House of Commons Library** (2012) *NHS Expenditure – Commons Library Standard Note* [online] Available at: www.parliament.uk/briefing-papers/SN00724/nhs-expenditure [accessed June 2014].
- House of Commons Science and Technology Committee** (2014) *Government horizon scanning Ninth Report of Session 2013-14* [online] Available at: www.publications.parliament.uk/pa/cm201314/cmselect/cmsctech/703/703.pdf [accessed June 2014].
- Lempert, R.J., Popper, S.W., Bankes, S.C.** (2003) *Shaping the Next One Hundred Years: New Methods for Quantitative, Long-Term Policy Analysis The RAND Pardee Centre* [online] Available at: http://www.rand.org/content/dam/rand/pubs/monograph_reports/2007/MR1626.pdf [accessed June 2014].

- Nature Editorial** (2013) *A deal on the horizon* Vol. 494, No. 7436
- Nature Editorial** (2012) *A vote for science* Vol. 490, No. 7421
- Nature Medicine** (2013) *Timeline of events: A brief history of what made news this year* Nature Medicine 19, 1560
- NHS England** (2013) *The NHS belongs to the people: a call to action* [online] Available at: www.england.nhs.uk/wp-content/uploads/2013/07/nhs_belongs.pdf [accessed June 2014].
- Oakley J. E. and O'Hagan, A.** (2010). *SHELF: the Sheffield Elicitation Framework (version 2.0)*, School of Mathematics and Statistics, University of Sheffield, UK. (<http://tonyohagan.co.uk/shelf>) [Accessed June 2014]
- Office for National Statistics** (2013) *Expenditure on healthcare in the UK: 2011* [online] Available at: www.ons.gov.uk/ons/dcp171766_308689.pdf [accessed June 2014].
- Office for National Statistics** (2013b) *Workforce jobs by industry section (SIC 2007) – seasonally adjusted – time series. Human health and social work activities* [online] Available at: http://www.nomisweb.co.uk/reports/lmp/gor/2092957699/subreports/gor_wfjsa_time_series/report.aspx? [accessed June 2014].
- Office for National Statistics** (2013c) *2011 Census: Provision of unpaid care 1, local authorities in the United Kingdom* [online] Available at: www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-and-quick-statistics-for-local-authorities-in-the-united-kingdom---part-1/rft-qs301uk.xls [accessed June 2014].
- Office for National Statistics** (2013d) *Background and Methodology, 2012-based National Population Projections* [online] Available at: <http://www.ons.gov.uk/ons/rel/npp/national-population-projections/2012-based-projections/rep-background-and-methods.html> [accessed June 2014].
- Office for National Statistics** (2014) *Population Estimates Total Persons for England and Wales and Regions, Mid-1971 to Mid-2012* [online] Available at: www.ons.gov.uk/ons/rel/pop-estimate/population-estimates-for-uk--england-and-wales--scotland-and-northern-ireland/mid-2001-to-mid-2010-revised/rft---mid-2001-to-mid-2010-population-estimates-analysis-tool.zip [accessed June 2014].
- Skills for Care** (2013) *The size and structure of the adult social care sector and workforce in England, 2013* [online] Available at: www.skillsforcare.org.uk/Document-library/NMDS-SC,-workforce-intelligence-and-innovation/Research/Size-and-structure-2013-vweb2.pdf [accessed June 2014].

Figure 2

- General Dental Council** (2014) *Facts and figures from the GDC Register March 2014* [online] Available at: www.gdc-uk.org/Newsandpublications/factsandfigures/Documents/Registrant%20figures%20March%202014.pdf [accessed June 2014].
- General Pharmaceutical Council** (2013a) *GPhC data sharing* [email] (Communication, 25th March 2013)
- Health and Social Care Information Centre** (2014) *NHS Hospital and Community Health Service (HCHS) Workforce Statistics in England, Non-medical staff – 2003-2013, as at 30 September* [online] Available at: www.hscic.gov.uk/searchcatalogue?productid=14385&topics=1%2fWorkforce%2fStaff+numbers&sort=Most+recent&size=10&page=1#top [accessed June 2014].
- King's Fund** (2013) *Volunteering in health and care: Securing a sustainable future* [online] Available at: www.kingsfund.org.uk/sites/files/kf/field/field_publication_file/volunteering-in-health-and-social-care-kingsfund-mar13.pdf [accessed June 2014].
- Health and Social Care Information Centre** (2014) *NHS Hospital and Community Health Service (HCHS) Workforce Statistics in England, Medical and Dental staff – 2003-2013, as at 30 September* [online] Available at: www.hscic.gov.uk/searchcatalogue?productid=14384&topics=1%2fWorkforce%2fStaff+numbers&sort=Most+recent&size=10&page=1#top [accessed June 2014].
- Health and Care Professions Council** (2014) *Number of allied health professionals registered with the HCPC excluding scientists and social workers* [online] Available at: www.hcpc-uk.org/aboutregistration/professions/index.asp?id=1 [accessed February 2014].
- Nursing and Midwifery Council** (2011) *Nursing and midwifery query, number of registrants in England* [email] (Personal communication, 31 August 2011).
- Office for National Statistics** (2012) *2011 Census: Health and provision of unpaid care, local authorities in England and Wales* [online] Available at: <http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-for-local-authorities-in-england-and-wales/rft-table-ks301ew.xls> [accessed June 2014].
- Skills for Care** (2013) *The size and structure of the adult social care sector and workforce in England, 2013* [online] Available at: www.skillsforcare.org.uk/Document-library/NMDS-SC,-workforce-intelligence-and-innovation/Research/Size-and-structure-2013-vweb2.pdf [accessed June 2014].

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