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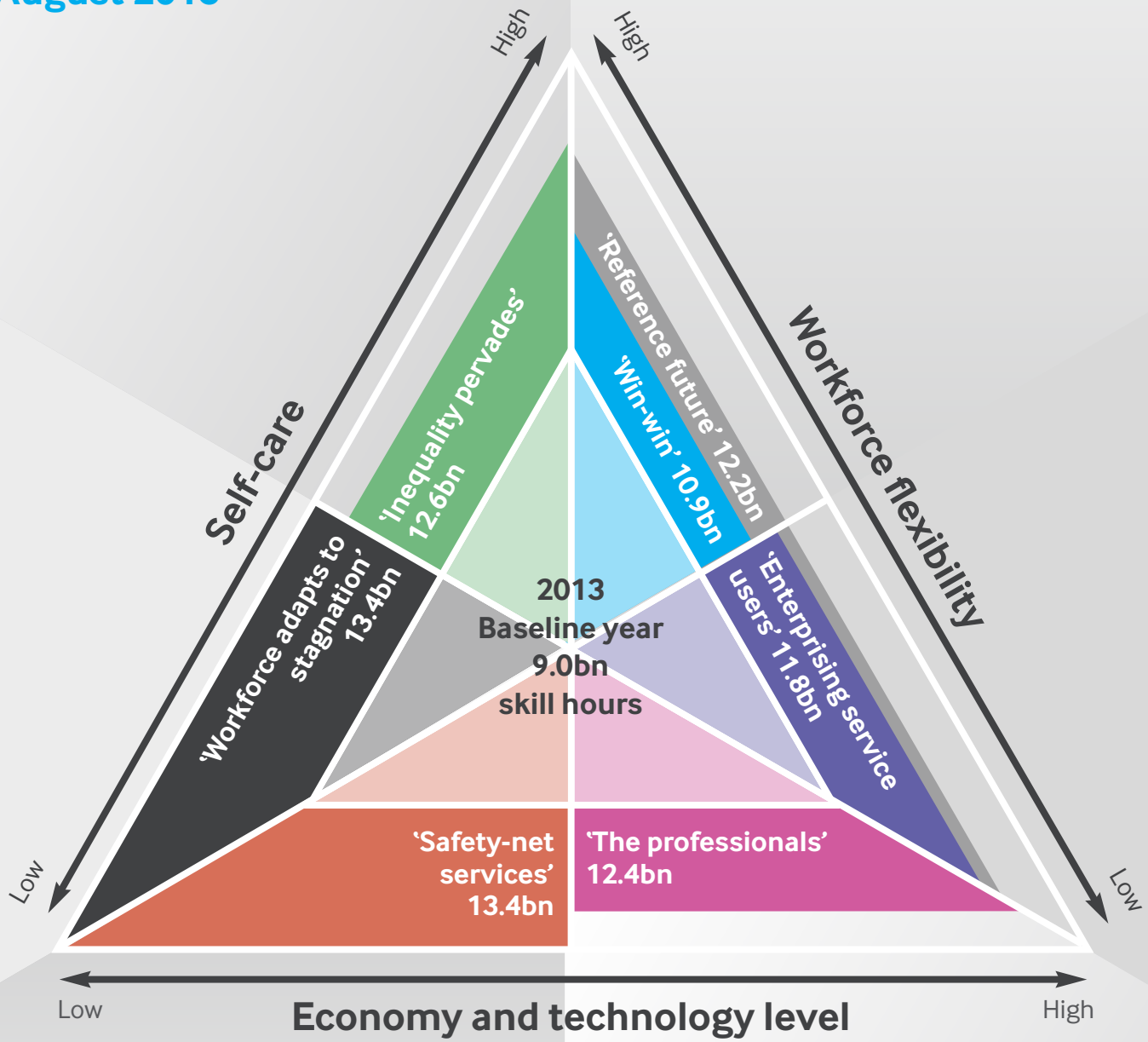
Future demand for skills: Initial results

HORIZON 2035
HEALTH AND CARE WORKFORCE FUTURES

August 2015



CFWI CENTRE FOR WORKFORCE INTELLIGENCE

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1. Introduction

HORIZON 2035
HEALTH AND CARE WORKFORCE FUTURES

Purpose of Horizon 2035: Health and care workforce futures

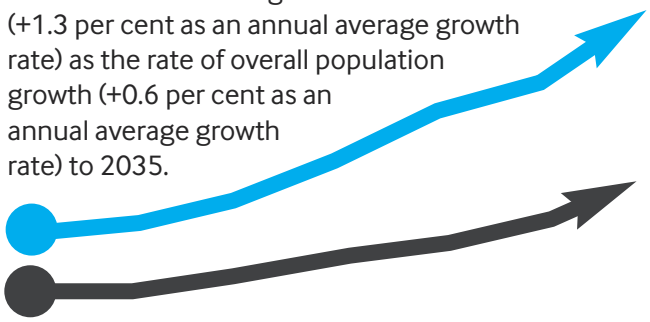
Horizon 2035 is a CfWI initiative to provide horizon scanning that will support the Department of Health's long-term strategic vision for the health, social care and public health workforce in England. The rigorous qualitative and quantitative research performed through this programme provides a range of insights and tools to consider future demands for workforce time across these three sectors.

In this report, we outline some initial results and messages from our Horizon 2035 work to date. A final publication will follow this later in 2016 once all analysis of this extensive work has been completed and verified.

Initial Horizon 2035 messages

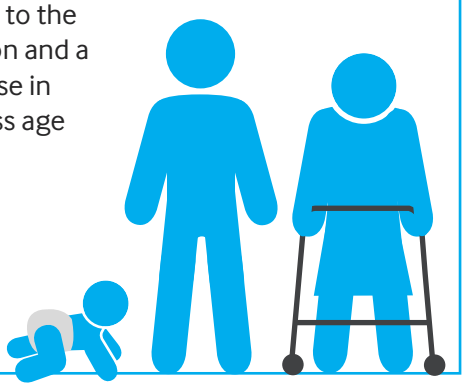
Demand for workforce time is growing faster than population

Based on our current understanding, we are projecting that demand for health and care workforce time could grow more than twice as fast (+1.3 per cent as an annual average growth rate) as the rate of overall population growth (+0.6 per cent as an annual average growth rate) to 2035.



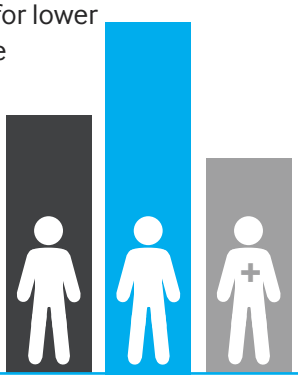
The significance of long-term conditions

Over 80 per cent of additional demand is driven by increasing healthcare and support needs which are associated with long-term conditions. This relates both to the ageing population and a projected increase in prevalence across age groups.



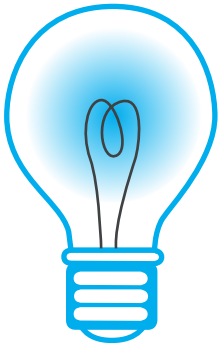
A different skill profile in 2035

The initial Horizon 2035 results suggest that the future profile of demand may be profoundly different to the picture of demand today. For example, growth in demand for lower 'levels' of skill – such as those associated with unpaid care, support carers and NHS bands 1-4 - are projected to substantially outstrip growth in demand for higher skill levels associated with medical and dental professionals.



Stimulating new ways of thinking

Quantifying and projecting the whole health, social care and public health system in terms of the component workforce skills can reveal new insights for workforce planning. These insights can surmount notions of workforces and sectors and help to align the skill mix of the future with the case mix of the future.



1.1 About this report

This report builds on the progress that the CfWI reported in a July 2014 publication (CfWI, 2014a). Since then, the CfWI Horizon Scanning team has advanced this cutting-edge research programme in consultation with the Department of Health (DH) and other sector stakeholders. This report provides an update to those involved and interested in the programme, it outlines the progress made over the last year by presenting some initial results and messages - including how these initial results were arrived at. For an overview of the progress made to date, and next steps, please see Figure 1 (opposite).

Since the last update, there have been important policy developments that are shaping the future of health and care services and workforces. These include the publication of NHS England's *Five Year Forward View* (NHS England 2014) and Health Education England's Strategic Framework – also known as *Framework 15* (HEE, 2014). These documents capture many of the long-term challenges facing the health and care workforce and identify ways that services can better meet demand. Accordingly, the Horizon 2035 programme seeks to align with the evidence, assumptions and directions of travel in these forward-looking publications when considering the workforce implications across future scenarios. We must also recognise that the Horizon 2035 system, containing healthcare, public health and social care, is wider in scope than other studies.

The Horizon 2035 programme has been widely shared and discussed with stakeholders in a variety of ways since it started in September 2013. For an overview of the key achievements over the last year and our proposed next steps, please see Figure 1.

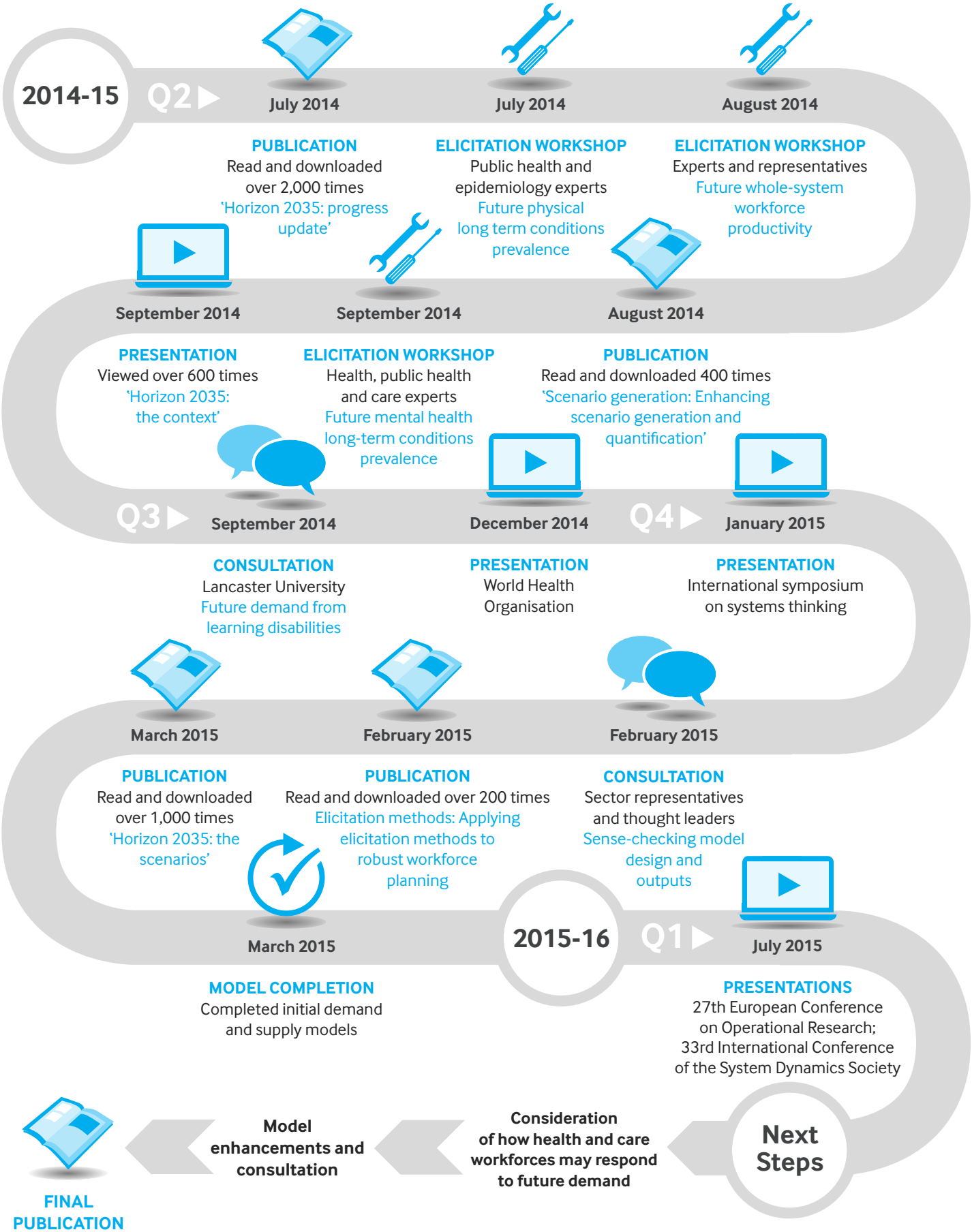
This report presents the following:

- **Early indicators: changes in demand** – this section presents high level findings for changes in demand for health and care skills to 2035 under 'reference future' conditions and in the six Horizon 2035 scenarios.
- **Describing skills and competence in the health, care and public health sectors** – this section introduces the definitions and language developed to describe the whole system, and the reasons for this taxonomy.
- **Quantifying wellbeing skills** – this section describes the process used to assign workforce activity to the Horizon 2035 taxonomy and what this looks like at a whole-system level.
- **Projecting demand for wellbeing skills** – this briefly describes the layers of calculation used in the Horizon 2035 demand model.
- **Next steps** – finally, this section outlines the next main directions of travel for the research as we look towards a final publication at the end of our intelligence gathering and interpretation.

The steps Horizon 2035 is taking

Understanding the context	We set up this 20-year view by telling the story of the last 20 years through workforce numbers, policy, the external environment, and events (CfWI, 2014c).
Mapping the present system	We have, with experts, considered the factors at play in the health, public health and social care workforce system, how they interact, and their size and shape.
Considering plausible futures	We prioritised and combined the factors at play in the system to generate scenarios 20 years in the future.
Quantifying these futures	We are applying system dynamics modelling to consider tangible effects of the scenarios on the workforce system.
Assessing the workforce implications	We are now drawing all activity together to identify the workforce planning areas of the highest concern for the Department of Health in the future.

Figure 1: Horizon 2035 timeline: milestones and impact since last update



2. Early indicators: changes in demand

2.1 The language and units of the results

The challenges with Horizon 2035 include capturing health, public health and social care together; the 20-year timeframe; and thinking beyond current notions of workforces and sectors to consider activity and ability expressed in terms of skills. For Horizon 2035, a 'skills and competence lens' has been developed to meet these challenges. It provides a common framework to describe varied workforce activity within and between the three sectors. This section presents early analysis of results by applying the Horizon 2035 skills and competence framework (Section 3 describes this in full). Section 4 outlines how we have quantified the skills framework by mapping current workforce activity onto these definitions.

This is a skills research programme covering multiple workforces and instead of units of headcount or full-time equivalent (FTE) that other workforce research applies, the most appropriate unit for Horizon 2035 is 'skill hour'. The CfWI defines a skill hour as an hour spent applying a skill, presented as a total for a given year. The reasons for this are because FTE rates vary between workforces, thus 'skill hours' are more comparable. This is important because the Horizon 2035 research aims to understand workforce demand and supply beyond current workforce configurations.

Skill hour

An hour spent applying a skill, presented as a total for a given year. This unit normalises for varying FTE rates between workforces and enables the identification of skill overlap and other skill-mix opportunities.

Throughout the Horizon 2035 analysis, the CfWI is seeking to consider what service-users encounter as they interact with the health and care system. The 'skill hour' unit allows the research to identify roles and responsibilities, and simultaneously consider concepts such as skill overlap, skill expansion, and skill mix using a common currency – all important factors for responding to future service-user demand projections.

2.2 Where the initial results come from

These demand projections were generated by the Horizon 2035 demand model which is described in Section 5. Rather than attempt to predict the future, the Horizon 2035 research methods recognise the intrinsic uncertainty of factors influencing workforce demand and supply in this complex system. There are two kinds of uncertainty – uncertainty about the future (captured by scenarios) and uncertainty about parameters used to model the future (captured through elicitation). Having captured these uncertain factors, we can then apply modelling techniques using the Monte Carlo analytical approach.

Monte Carlo approach

Monte Carlo simulation runs a model multiple times to sample the input parameters across their elicited range of uncertainty. This captures how the outputs vary for a range of changes to the inputs and is used to show the overall uncertainty.

To arrive at these results, 800 simulations of the model were performed, with each simulation sampling differently from values where there is uncertainty; applying the Monte Carlo analytical approach. The six Horizon 2035 scenarios and 'reference future' conditions were simulated.

Uncertainty is calculated and presented in the following graphs and dashboards by taking the spread between the 90th and 10th percentile simulations as a proportion of the median simulation.

The reference future is the principal or central projection. We ask a panel of experts for their estimates of key parameters, such as retirement rates, changes in population need and workforce productivity. We do this using a formal and documented elicitation protocol to obtain the values and their uncertainty, represented by a probability distribution. Plugging these into the model allows us to project demand and supply into the future. Unlike a baseline or business as usual future, the reference future includes changes to policies, services and underlying health and care trends that are thought to be reasonably likely.

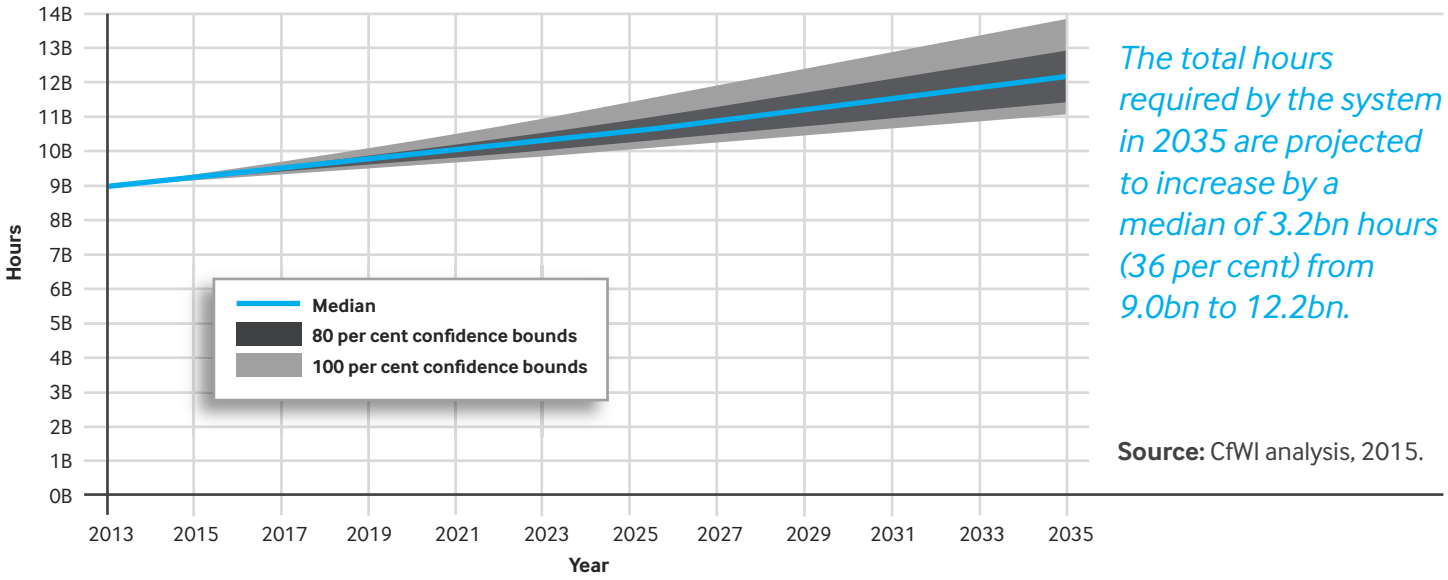
We use the reference future as a reference point when eliciting key parameters across a set of scenarios. We ask the same expert panel to assess the future described by each scenario, and how key parameters might change relative to the expected future. This reduces the risk of bias. The reference future is not a forecast, and like all scenarios the probability of the future unfolding in exactly this way is zero.

Reference future

The reference future is a reasonable and credible future. We assume underlying trends roll forward and the absence of big changes and surprises. Existing policies continue into the future, together with changes that are reasonably certain to happen according to the current political situation, in-the-pipeline changes to services, and heath and care need and risk factors.

The results capture population growth and ageing, prevalence of conditions by age, the complexity of meeting needs by age, and change in prevalence over time. Productivity assumptions are also included and they are in line with the 0.8 per cent annual rate in the Five Year Forward View (NHS England, 2014). As we develop a richer picture of specific areas of this whole system, we continue to evolve the demand and supply models.

Figure 2: Total hours 2013-2035 under 'reference future' conditions, median and uncertainty



The total hours required by the system in 2035 are projected to increase by a median of 3.2bn hours (36 per cent) from 9.0bn to 12.2bn.

Source: CfWI analysis, 2015.

2.3 Reading the initial results

The initial results shown in this chapter project demand for skills to 2035 for the Horizon 2035 workforce system under 'reference future' and scenario conditions. While the projections contain carefully sourced assumptions reflecting consultation with stakeholders, they are presented to inform the debate on health and care workforce futures, not to be a definitive statement of what will occur between now and 2035.

2.4 Change in total hours demanded by the whole system in 2035

Figure 2 shows the projected total change in hours from 2013 to 2035. It reflects the whole system covering health, social care, and public health as well as voluntary and unpaid workforces. These changes are recorded under the reference future conditions. The total hours required by the system in 2035 are projected to increase by a median of 3.2bn hours (36 per cent) from 9.0bn to 12.2bn. All simulations project an increase – for example, the range with 80 per cent confidence is between 2.5bn hours (27 per cent growth) and 4.0bn hours (44 per cent growth).

The graph in figure 2 shows the relative likelihood of possible outcomes. The blue line is the central projection, where there is a 50 per cent probability that the total skill hours required by the system will be above or below this line. There is estimated to be a 80 per cent chance that the hours required by the system will be within the dark grey central band at any date up to 2035. The light grey band takes the distribution out to 100 per cent. It intends to show how the more uncertainty there is, the wider the bands will appear. This graph represents the CfWI's best estimate of the future, but of course the future is not certain and the true value could be outside of these bands.

Analysis

There is a median annual growth rate (AGR) of 1.3 per cent which is more than double the 0.6 per cent AGR projected for the population in England over the same period (ONS, 2014 and CfWI calculations). It is important to consider that the model accounts for factors beyond population growth. However, this rate is lower than the 5.1 per cent AGR forecast as spending requirements in NHS England's *Call to Action* (NHS, 2013).

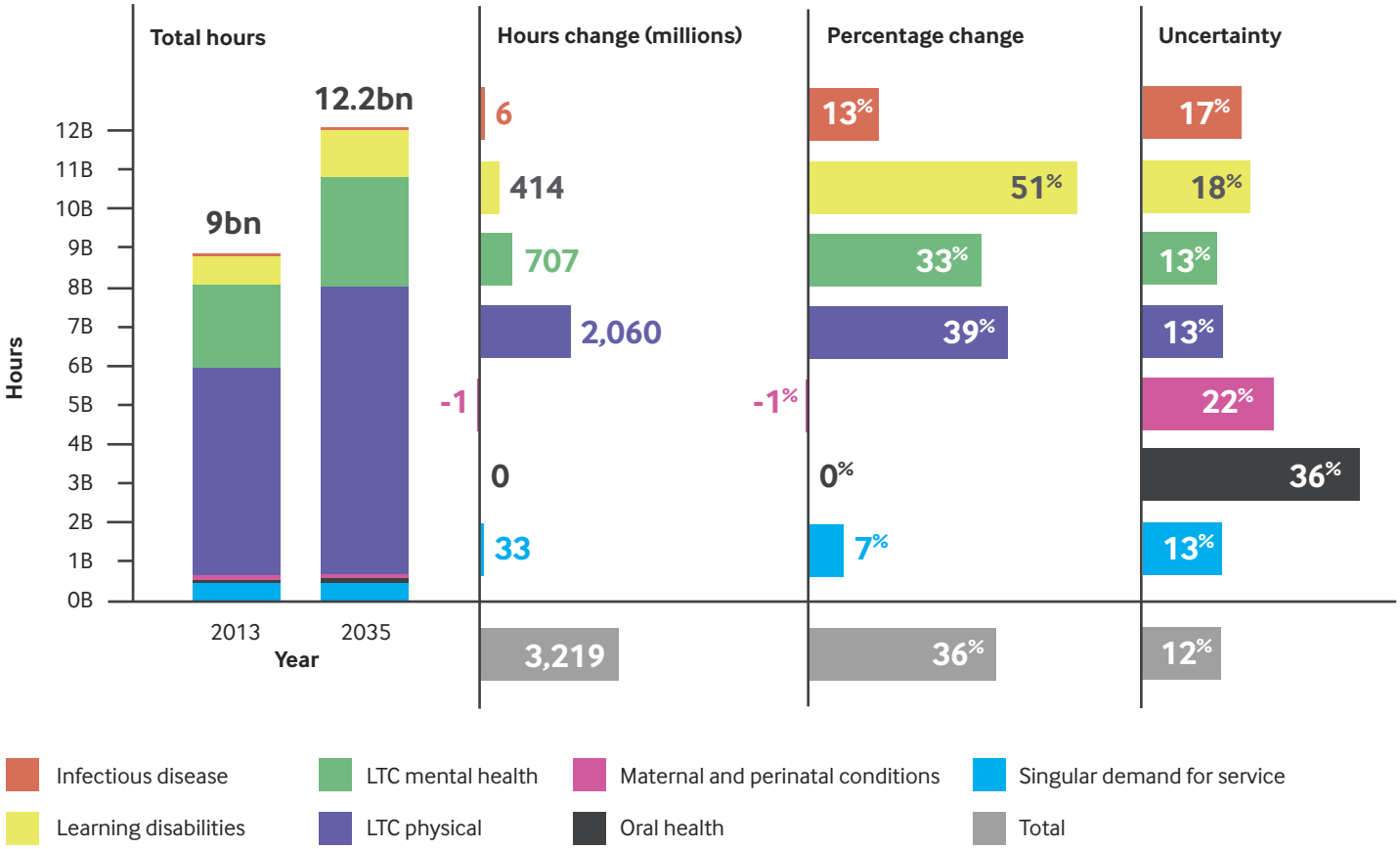
In our projections, we expect spending requirements to include many costs beyond the workforce, all of which are projected to increase at faster rates and exclude efficiency savings and privately funded healthcare. It is expected that our overall pattern of change would lie within these projections."

There are national and international implications from this rise in demand for health and care skills. In the UK, the number of total jobs is projected to increase below the population growth rate over the next 10 years (UKCES, 2014). Hence, the health and care sector may represent a larger share of total employment in the future.

Looking overseas, many countries face a similar growth in demand for these skills. The World Health Organisation's Global Health Workforce Alliance estimates a global deficit of about 12.9 million skilled health professionals (midwives, nurses and physicians) by 2035 (WHO, 2014). In the European Union, the healthcare sector is expected to grow at a faster rate than other sectors and create additional demands for skilled workforces (European Commission, 2012). A 2007 OECD study reported that 'there is increasing competition between OECD countries to attract and retain highly skilled workers in general, and health professionals in particular... [because] population ageing and changing technologies are likely to contribute to an increase in the demand for health workers, while workforce ageing will decrease the supply' (OECD, 2007).

Having demonstrated that there will be an increase in the overall skill hours required from health and care workforces, what are the types of demand that are driving this increase?

Figure 3: Total hours by demand source, 'reference future' conditions, change in hours, percentage change and total uncertainty 2013-35 (median projection)



Source: CfWI analysis, 2015.

2.5 Sources of demand for future workforce skills

The dashboard in figure 3 shows the hours in 2013 and 2035 by demand source for the whole system, the change in hours and percentage change for each type of demand and the spread of uncertainty. Demand is projected to increase for all types except maternal and perinatal conditions, where a slight fall in birth is projected by the ONS in 2035. For definitions of these demand sources, please see section 3.

Analysis

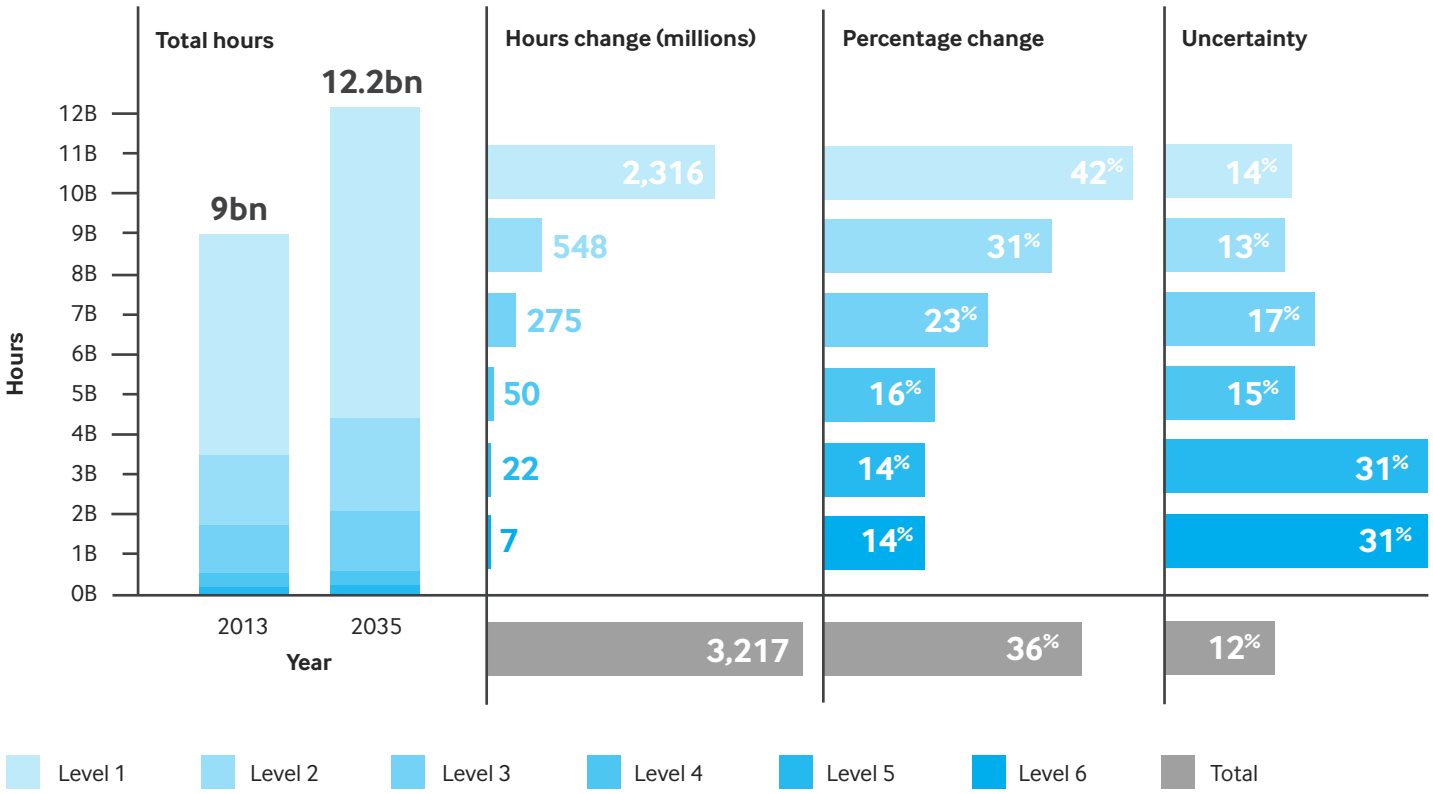
In 2035, 86 per cent of projected additional demand for skills will be due to increasing physical and mental health long term conditions (LTCs). The significance of LTCs is already well documented in other research and policy literature such as the *QIPP LTC programme* (NHS, 2010). In addition, the *Five Year Forward View* (NHS England, 2014) recognises the central task of the NHS to manage LTCs and describes what some of these additional skills might be. It states that to meet future needs, services will need to be integrated around the patient.

The fastest growing source of demand is learning disabilities and the spread of uncertainty for this is higher than average. The growth in demand associated with learning disabilities in our modelling is based upon assumptions in Emerson and Hatton (2011).

Although projected to grow by a nominal amount, there is significant uncertainty around future demand from oral health conditions. Change in need assumptions are the main source of this based on those listed in the *CfWI Strategic review of the future dentistry workforce* (CfWI, 2013).

These demand projections can also be broken down and considered in terms of 'skill level', which categorises health and care workforces according to increasing levels of education, training and legal responsibilities.

Figure 4: Total hours by skill level, 'reference future' conditions, change in hours, percentage change and total uncertainty 2013-35 (median projection)



Source: CfWI analysis, 2015.

2.6 Change in demand by skill level in 2035

The dashboard in figure 4 shows total hours in 2013 and 2035 by skill level for the whole system, the change in hours and percentage change for each skill level, and also the 80 percentile spread of uncertainty. Skill levels describe increasing training and responsibility and for full definitions, please see section 3.

Analysis

The model projects that 70 per cent of additional workforce capacity required in 2035 will be for skill level 1. Level 1 skills require no formal training and hence have less organisational accountability. They relate to unpaid carers and volunteers in health and care. While level 1 skills traditionally lie outside of formal health and care workforce policy, they are important to consider in Horizon 2035 due to the potential impacts of the size of this future demand on the paid workforces which have a higher skill level associated with them.

Of the paid workforces, level 2 skills that are associated with health and care support workers, are projected to grow fastest and account for 61 per cent of additional paid hours in 2035. While a lot of work has been undertaken to address quality assurance and accountability for unregistered workforces (for example the 2013 *Cavendish Review*, UK Government, 2013), our initial modelling suggests capacity and capability may be as important.

Skill levels 5 and 6 are also projected to grow, although there is high uncertainty associated with this. The main source of uncertainty is around productivity as skills at this level are arguably more sensitive to service innovation and also case complexity – both of which are uncertain in the future. Managing uncertainty in demand for highly specialised medical and dental staff is a critical challenge in this workforce system and previous CfWI research has examined this in detail (CfWI, 2012).

To acknowledge the uncertainty of future projections, the CfWI produces scenarios to describe a plausible range of futures to test responses or options against. In Horizon 2035 we have generated six scenarios (www.horizonscanning.org.uk/our-research/horizon-2035/scenarios/) and describe their quantitative results on page 8.

Summary of scenarios

Scenario	Brief overview
Win-win	As a result of a very flexible workforce, positive economic conditions, strong engagement of the population in their care, and high levels of technology, both the workforce and service users benefit from joined up care and services.
Enterprising service users	High levels of self-care in the population, widespread adoption of technology across the system, a positive economic environment, and low levels of workforce flexibility combine to produce highly specialised, yet fragmented, services.
The professionals	High investment in technology and low workforce flexibility lead to a specialised but fragmented system. Overall population wellbeing decreases with service users unable to exercise self-care and are frustrated by the level of complication in services.
Safety-net services	Workforce resilience is severely tested. Here, health and care inequality increases dramatically as a tiered system emerges characterised by under-capacity public services that can only passively address the most severe needs, and expanded private provision for the better-off.
The workforce adapts to stagnation	A nimble workforce adapts to challenging situations of over-subscribed services and disengaged service-users by bolstering generalist skills to develop multi-disciplinary working and specialisation in social care.
Inequality pervades	Poor economic growth, slow progress in service innovation, and an inflexible workforce combine to dramatically increase health and care inequality and lead to lower levels of workforce retention.

2.7 Change in total hours required by the system in 2035 by scenario

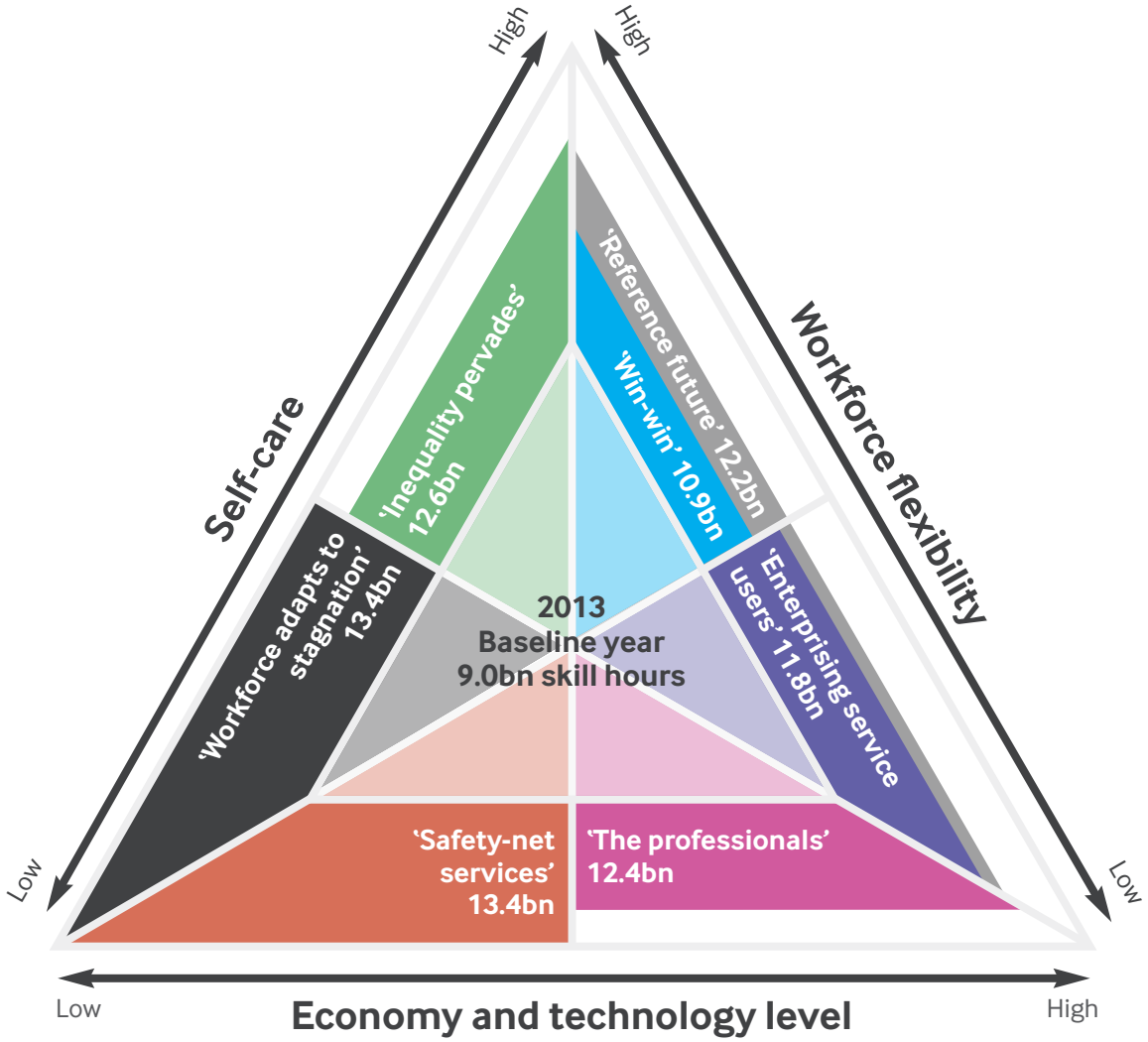
The model not only produces 'reference future' projections - where current trajectories of population and disease prevalence continue as they are and services are organised and delivered in the same way – but also calculates projections for each scenario. Differences between scenarios in these initial results are driven by variance in future disease prevalence and productivity improvements. To consider what may drive variation between the scenarios, it is useful to see how the projected median growth in total hours of demand for skill hours relates to how the scenarios are configured.

The graphic in figure 5 shows the future projected median demand of the scenarios against 2013 and business as usual. In the graphic:

- The coloured triangles represent the median demand for skill hours for each scenario in 2035.
- The inner white triangle represents demand for skill hours in 2013.
- The outer white triangle represents demand for skills hours in 2035 under 'reference future' conditions.
- The sides of the overall triangle graphic represent the scenario factors and the states of the scenario, such as high or low workforce flexibility, are indicated by these axes.
- For example, **'Win-win'** is represented by the pink triangle, where skill hours demand is 10.9bn in 2035, above 2013 but less than business as usual in 2035. The scenario has high workforce flexibility, high levels of self-care, a strong economy and high adoption of technology.

Two scenarios have lower total demand than 'reference'future'l; **'Win-win'** and **'Enterprising service users'**. Both feature a strong economy, high adoption of technology and high levels of self-care. The two scenarios with the greatest demand for workforce time are **'Workforce adapts to stagnation'** and **'Safety-net services'**. Both of these scenarios have low self-care, a stagnant economy and slow adoption of technology. The scenarios present many challenges beyond the simple impact on demand for skill hours. These could include health inequalities and possible options that are available to policy makers given variable economic conditions.

Figure 5: Total median hours 2013-2035 under 'reference future' conditions, and in the six scenarios



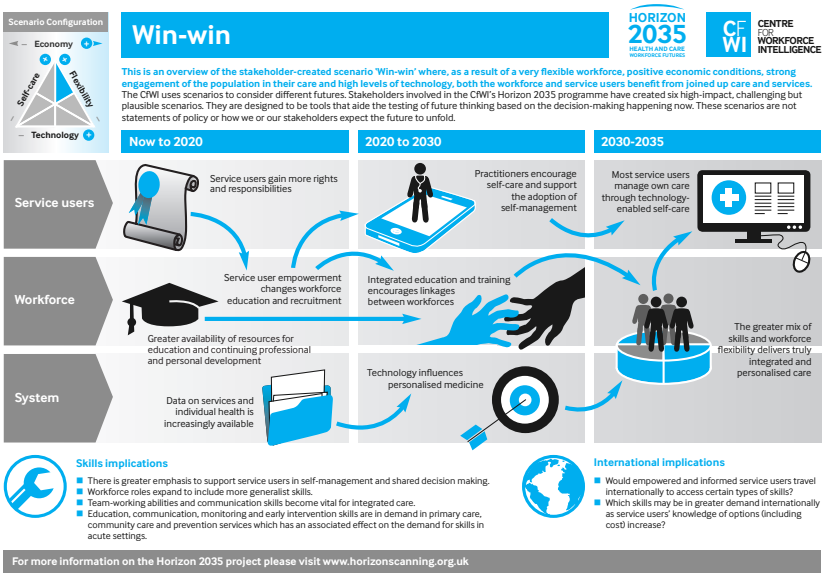
Further information

For more information on the scenario narratives, please go to...

www.horizonscanning.org.uk/our-research/horizon-2035/scenarios/

...to view the scenario posters.

An example thumbnail is provided opposite:



The Horizon 2035 'wellbeing skills' cube

'Wellbeing skills' are the workforce activities at the interface of the service-user and health and care services. We call them 'wellbeing' skills as this goes beyond notions of 'health' and 'care' and offers a single categorisation or ambition for this whole system. In Horizon 2035, we are looking at the demand and supply of these skills.

In attempting to capture diverse workforce roles, the framework has been developed to be appropriate to the scope of the Horizon 2035 programme and to balance two opposite issues in a modelling project of this scale. The first issue is the resolution being too high so that the framework becomes too complex and workforces have little overlap. The second is the resolution being too low so that the framework is too general and abstract.

The framework developed for Horizon 2035 conceives of wellbeing skills as a combination of three dimensions: eight 'skill types', six 'skill levels' and seven 'demand sources'. The relationship between these dimensions and the total resolution of this currency is represented by this cube.

Wellbeing skill type

Skill types describe the nature of the skill applied. They aim to capture the broad range of activities that workforces perform in relation to the complete patient or care pathways.

These eight categories emerged from in-depth analysis of existing skills and competence frameworks, approaches and service pathways. The sources include NHS Employers Knowledge and Skills Framework, Skills for Health Careers Framework, the Public Health Online Resource for Careers Skills and Training Skills and Knowledge Tool, Skills for Care Code of Conduct and the European Commission – Investing in Future Jobs and Skills Programme.

See References for full sources.

Prevent	Reduce the instance or incidence of ill health and demand for care.
Enable	Increase the control and capacity service users have to improve their situation.
Assess	Identify and understand a presenting problem, including evaluations.
Plan	Define the package of skills required to meet service user needs.
Treat	Change the condition and restore the service user to good, or improved health.
Rehabilitate	Restore functionality, independence, participation and even purpose of service user.
Relieve	Assist service users by abating symptoms of ill-health and distress and meet support needs.
Link	Connect different sectors, services, workforces and their skills around a holistic understanding of the needs of the service user.

Example:

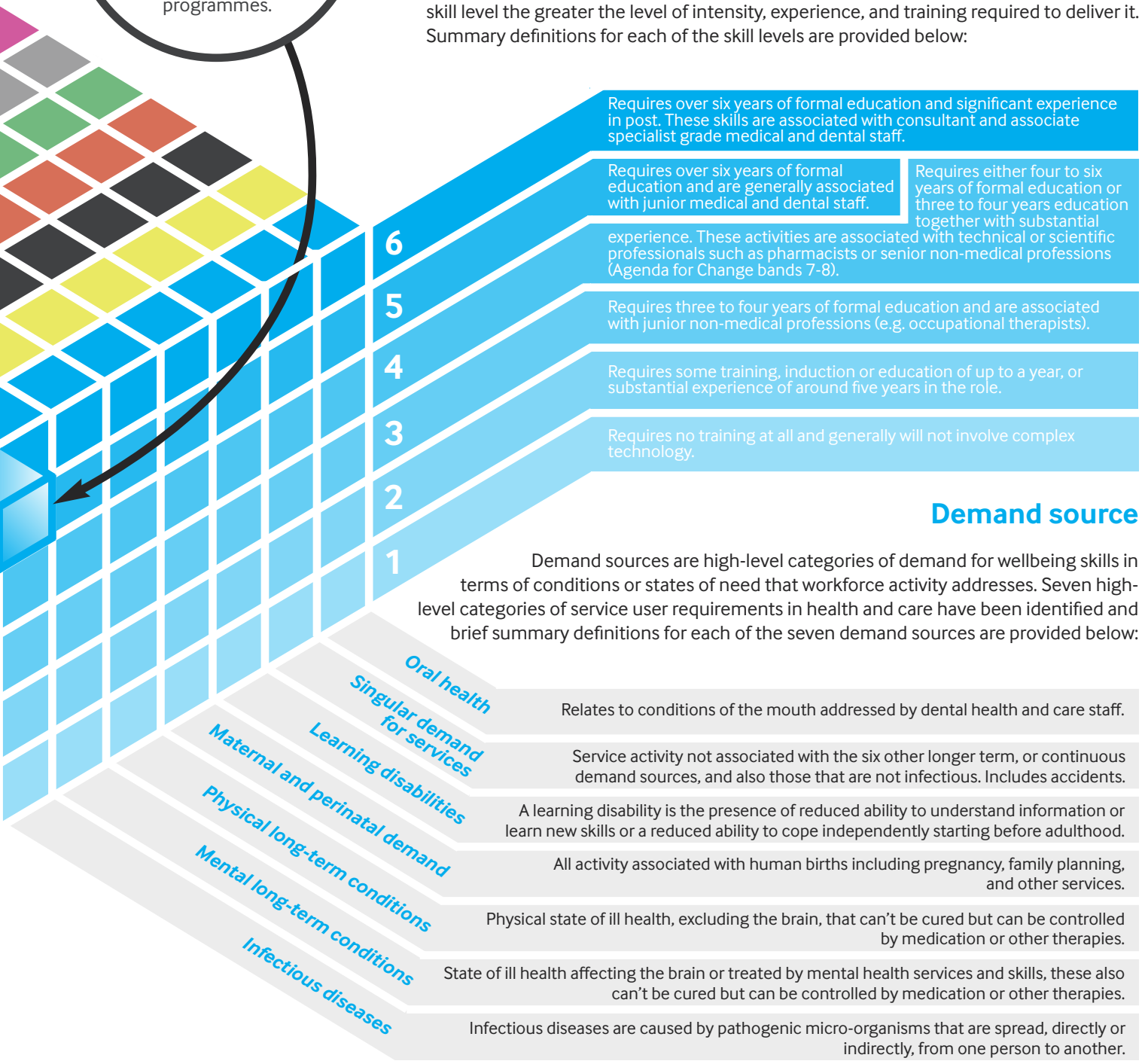
Level 5 links skills associated with infectious disease. This could include public health consultants liaising with community services and stakeholders to deliver public health programmes.

Skill level

The second dimension to the workforce skills is skill level. This is to recognise factors such as:

- skill concentration and intensity
- the value of experience in all roles
- legal accountabilities
- the application of complex technology
- potential boundaries to skill expansion

Skill level is segmented into six levels from level 1 through to level 6. The higher the skill level the greater the level of intensity, experience, and training required to deliver it. Summary definitions for each of the skill levels are provided below:



Demand source

Demand sources are high-level categories of demand for wellbeing skills in terms of conditions or states of need that workforce activity addresses. Seven high-level categories of service user requirements in health and care have been identified and brief summary definitions for each of the seven demand sources are provided below:

Oral health	Relates to conditions of the mouth addressed by dental health and care staff.
Singular demand for services	Service activity not associated with the six other longer term, or continuous demand sources, and also those that are not infectious. Includes accidents.
Learning disabilities	A learning disability is the presence of reduced ability to understand information or learn new skills or a reduced ability to cope independently starting before adulthood.
Maternal and perinatal demand	All activity associated with human births including pregnancy, family planning, and other services.
Physical long-term conditions	Physical state of ill health, excluding the brain, that can't be cured but can be controlled by medication or other therapies.
Mental long-term conditions	State of ill health affecting the brain or treated by mental health services and skills, these also can't be cured but can be controlled by medication or other therapies.
Infectious diseases	Infectious diseases are caused by pathogenic micro-organisms that are spread, directly or indirectly, from one person to another.

3. Describing skills and competence in the health, care and public health sectors

3.1 Why a skills and competence approach?

Section 2 introduced how a language of skills can help address the challenges of the Horizon 2035 research such as the need to capture the whole system, the 20 year timeframe, and attempting to think beyond current ideas of workforces and sectors.

By thinking in terms of workforce activity using a common currency of skills, questions such as what workforces ***can*** and ***could*** do as part of future service delivery can be investigated. Rather than starting from existing notions of sectors, settings, services and professions, a skills approach starts with a common currency of health and care needs. Modelling then projects this demand for skills forward in time and the analysis can work back from this future picture of demand for skills in order to consider how workforces may respond.

The Horizon 2035 approach and taxonomy therefore offers a framework and language to represent innovative solutions and models of care and reveal the system-level effects associated with them. Examples of skill changes that may be represented include *Healthy Living Pharmacies* which recognised that pharmacist skills can augment the traditional primary care workforce (NPA, 2013) and the re-emphasised role of generalist medical skills in hospitals (Health Foundation, 2011).

In terms of limitations, the outputs of a skills and competence approach are dependent on the scale and rigour of the inputs. In applying a common currency of skills for health, social care and public health, aggregations and simplifications have to be made to reduce complexity to a manageable number of categories; for example there are around 30 medical specialties which we have represented together as one workforce group amongst a total of 16 overall workforce groups in Horizon 2035. The outputs and simulations that can be carried out reflect the level of resolution of these categorisations.

3.2 Defining skills and competence for Horizon 2035

Drawing on academic and policy literature, the Horizon 2035 skills and competence framework describes competence as a complex combination of skills, personal attributes, and knowledge. This is shown below.

Adapted from Cowan et al, 2005 (UEMS, 2011)

Many organisations apply skills and competence approaches to the health, public health, and social care sectors. Hence to develop our framework, we have held consultative meetings with experts from bodies such as The King's Fund, NHS Employers, Skills for Care, and many other organisations.

3.3 What has been measured and modelled

Some components of skills and competence are outside the scope of this programme, and have not been modelled in Horizon 2035. This includes the role of knowledge, personal attributes, and individual characteristics. The skills component is broken down into 'facilitation skills', 'leadership skills' and 'wellbeing skills'. While facilitation and leadership activities such as estates, IT, and clinical leadership play essential roles in service delivery, they are also out of scope in the CfWI modelling. This is because the Horizon 2035 model only quantifies 'wellbeing skills' in terms of the three dimensions that are outlined in a cube on pages 8 and 9.

4. Quantifying wellbeing skills

4.1 Approach and method

The skills and competence framework was created to meet the purpose and scope of this research programme. As section 3 describes, it is derived from analysis of skill frameworks and consultation with sector experts and representatives. The framework uniquely considers workforces across healthcare, public health, and social care collectively. Where there is no available comparable workforce or service activity data, we have used the best available proxy data. This includes evidence from job descriptions and codes of practice. The CfWI has made assumptions verified by experts in order to map workforce activity onto this framework.

These assessments aim to capture what each workforce is doing based upon firstly ***what they are competent to do*** – by analysing job descriptions, codes of conduct and education standards; and secondly evidence for ***what they are doing*** using available activity data.

4.2 Workforce groups

Figure 6 shows the size of each of the Horizon 2035 workforce groups in terms of the supply of skill hours in 2013-14. The total workforce system in 2013-14 has a headcount of 11 million and a full time equivalent of 5.5 million. This system represents one in five of England's total population and in 2013 there was a total of 9.0 billion hours of health, social care and public health activity.

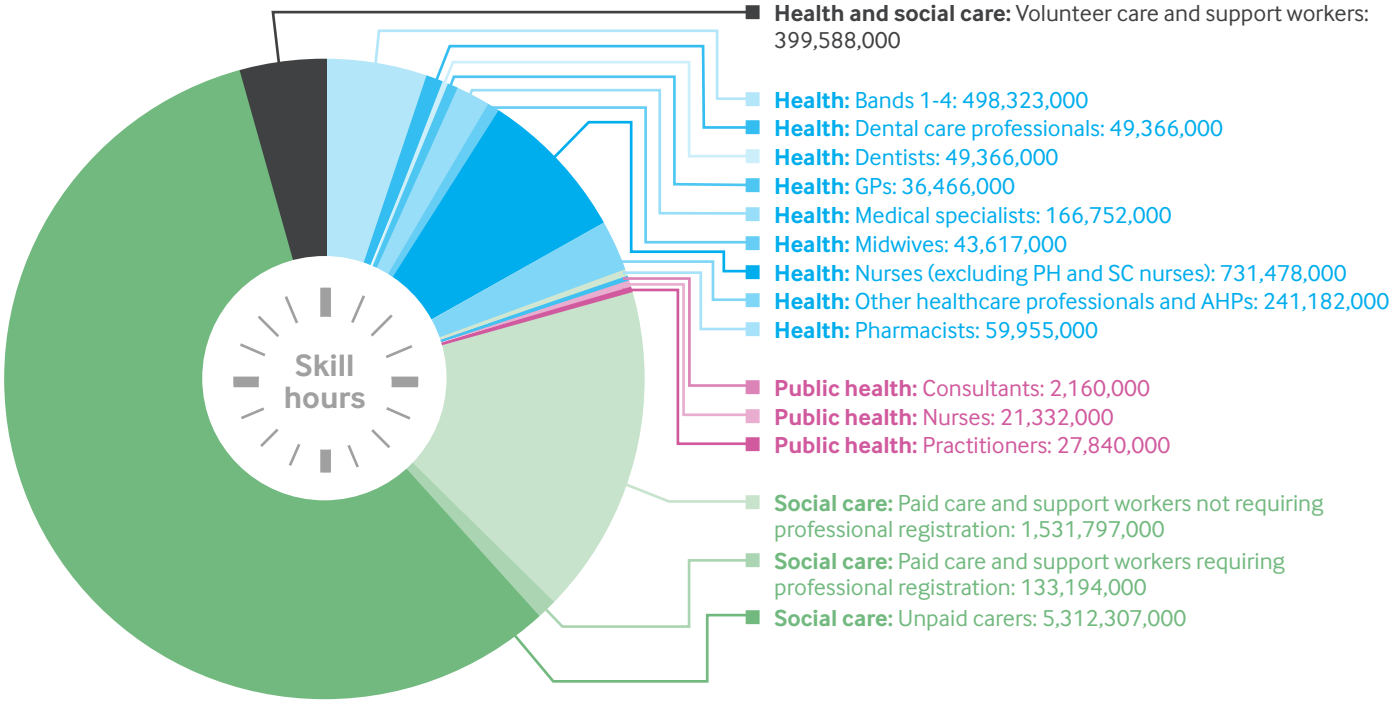
Unpaid and voluntary care account for 61 per cent of total time and are a significant component of the Horizon 2035 system. However, when analysing this system, we are not only interested in the largest volumes of hours, we also recognise the significance of changes to smaller, more skill-intensive workforce groups.

4.3 Quantifying skill types and levels

Figure 7 (page 14) shows the breakdown of time for the whole Horizon 2035 workforce system by skill type (vertical) and skill level (horizontal) as a proportion of total time in 2013-14. The total of these proportions are also shown by skill type (far right column) and level (bottom row). The data for this chart is the aggregate of all assessments and assumptions to map the Horizon 2035 workforces onto the skills framework.

The chart represents the skill profile of the entire Horizon 2035 system in 2013. Due to the size of the unpaid care workforce and the paid but unregistered workforces, hours in the system are distributed towards the lower skill levels. Overall, treating skills make up a very small proportion of total skill activity in the

Figure 6: Total hours by Horizon 2035 workforce group in 2013-14



Source: See References for data sources

Figure 7: All Horizon 2035 workforce activity by skill type and level 2013-14

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Total
1. Prevent	17.45%	4.02%	1.90%	0.48%	0.20%	0.07%	**24.1%**
2. Enable	8.81%	2.67%	1.79%	0.41%	0.11%	0.03%	**13.8%**
3. Assess	5.87%	3.38%	2.58%	0.61%	0.40%	0.11%	**13.0%**
4. Plan	5.83%	1.76%	1.97%	0.43%	0.18%	0.07%	**10.2%**
5. Treat	(Nil)	0.59%	0.71%	0.30%	0.19%	0.06%	**1.9%**
6. Rehabilitate	3.02%	1.31%	1.08%	0.37%	0.06%	0.03%	**5.9%**
7. Relieve	14.60%	4.11%	1.76%	0.27%	0.12%	0.03%	**20.9%**
8. Link	3.19%	3.20%	2.60%	0.87%	0.33%	0.08%	**10.3%**
Total	**58.8%**	**21.0%**	**14.4%**	**3.7%**	**1.6%**	**0.5%**	**100.0%**

health and care system across England, reflecting how a relatively small amount of the system is concerned with the curing of conditions. This picture is supported by the fact that 70 per cent of healthcare costs are associated with long term conditions that cannot at present be cured (DH, 2012).

Looking at skill level 1 by skill type, the profile captures the ***preventative*** and ***supportive*** nature of unpaid care reflecting how this workforce helps service users to manage long-term conditions and avoid admissions to residential care or hospitals. The absence of treating activity for level 1 skills reflects how the role of unpaid care is not to cure conditions but rather to offer support and alleviate symptoms. At the other end of skill intensity and experience, the profile shows the significance of ***assessment***, ***treating*** and ***linking*** skills for skill levels 4 to 6.

4.4 Demand sources by sector for H2035 workforces

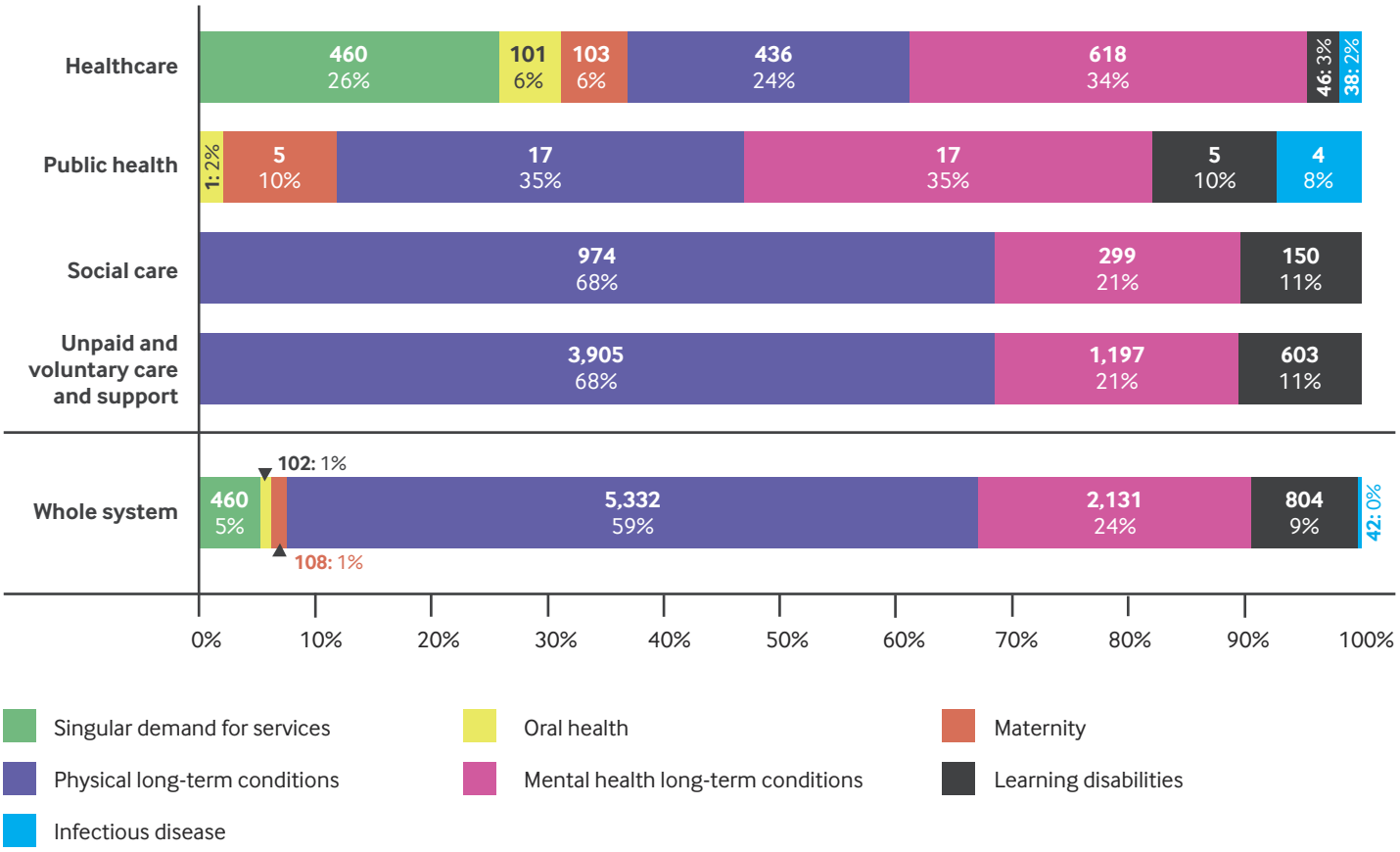
Figure 8 shows total time in the Horizon 2035 system by source of demand, both overall and divided by sector in 2013-14. As with the previous chart, the data for figure 8 is the aggregate of all assessments and assumptions to map the Horizon 2035 workforces onto the skills framework.

The voluntary and unpaid workforces are split out as they both relate to the informal workforce sector in health, and also care providers. The chart shows the significance of long term conditions (LTCs) which account for 83 per cent of total workforce time. This assessment is supported by other research including the *Quality, Innovation, Productivity and Prevention* commissioning and development programme for LTCs which outlines these conditions as 'the main driver of activity' (NHS, 2010) in the NHS.

Key data sources contributing to this picture include:

- workforce FTE by areas of work in the *NHS Staff Census* (HSCIC, 2014),
- social care activity by client types in *Community Care Statistics* (HSCIC, 2014a),
- FTE medical specialists by specialty in the *NHS Staff Census* (HSCIC 2014b),
- expenditure on public health recorded in *Public Health and Prevention Expenditure in England* (Health England, 2009),
- the *Department of Health Compendium* on long term conditions third edition (DH, 2012).

Figure 8: Total whole-system workforce by demand source and sector 2013-14 in hours (millions) and percentage



Source: CfWI analysis

5. Projecting demand for wellbeing skills

5.1 Bespoke, innovative modelling approach

The purpose of the demand modelling is to project the demand for skills for a range of plausible futures – which are described in the Horizon 2035 scenarios (See CfWI, 2015) and the 'reference future' assumptions. The model therefore is a skills demand model, not a workforce model and it is based upon the Horizon 2035 skills and competence framework described in section 3.

The Horizon 2035 demand model has been developed based on systems thinking methods and using the system dynamics simulation approach. Systems thinking methods provide a way of analysing and understanding a system by taking into account the cause-and-effect relationships that drive system behavior (Meadows, 2008).

System dynamics (SD) simulation has been used as it is most appropriate for modelling the behaviour over time of complex systems with feedback. The CfWI have a formalised approach to developing system dynamics models which is reported in *Developing robust system dynamics based workforce models: a best practice approach* (CfWI, 2014b).

SD models can be extended to increase detail and accuracy in particular areas and address additional issues as they arise. Therefore the high-level, whole-system approach undertaken here offers a platform for further, high-level modelling and research.

5.2 Conceptualising changes in demand for this whole-system

The health and care workforce system is highly complex and not every driver or detail can be quantified and calculated. Therefore simplifications and assumptions have to be made to make the task of modelling manageable. Figure 9 (page 17) gives a visual overview of the model structure.

The starting assumption for our modelling is that a volume of demand for health and care skills is met by a supply of skills in the health, public health, and social care landscape now. This volume is quantified in terms of the current workforce activity of all the workforces shown in Figure 6 (9.0bn skill hours – see page 13). This excludes needs not met by the workforce now as it is challenging to quantify this reliably.

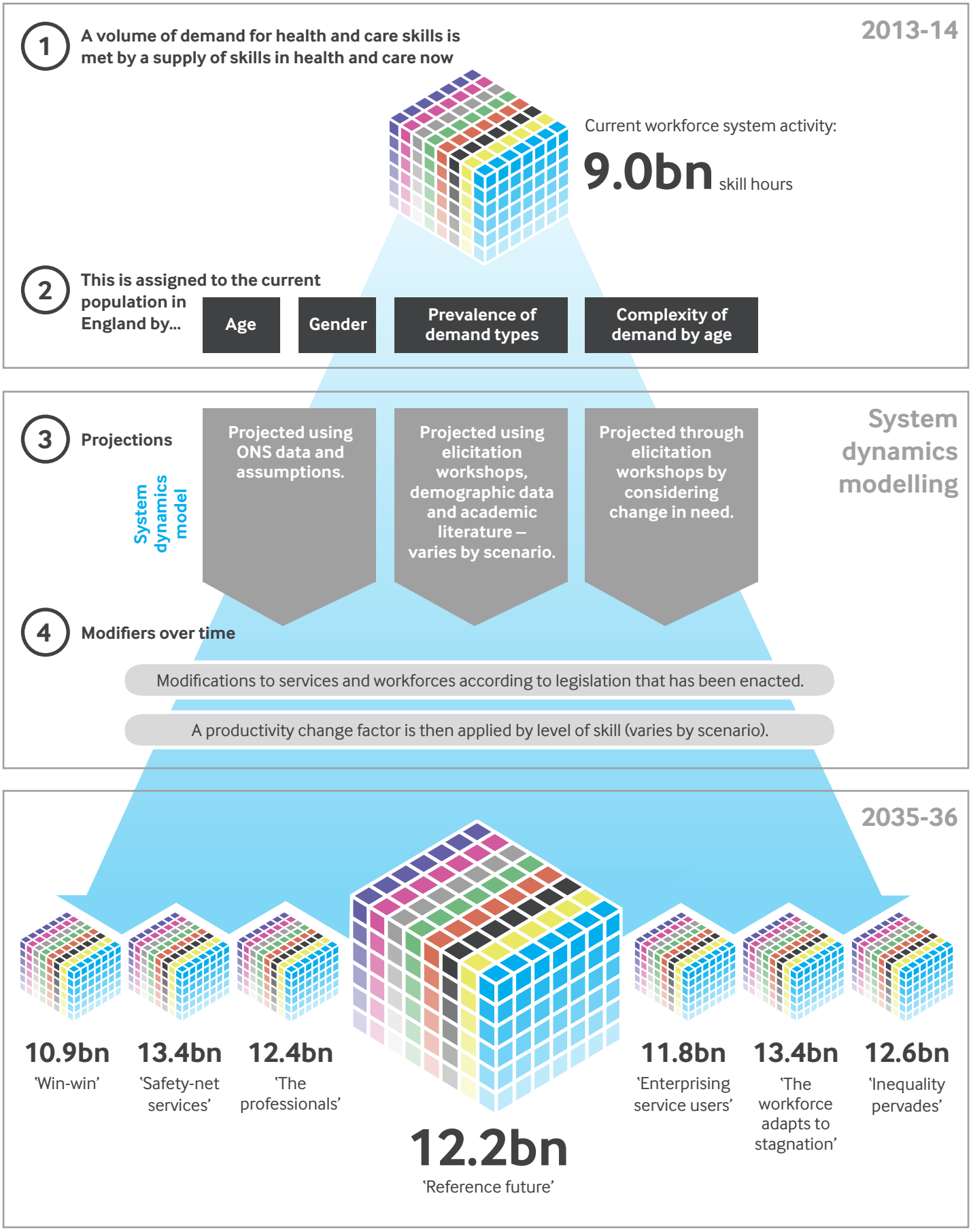
In our model, current workforce activity (as of 2013-14) is assigned to the population in England by age, gender, the prevalence of demand types, and the complexity of demand by age. This creates a rich picture of how needs are met. To quantify changes in this demand looking into the future, the model starts by calculating the population in England on a year-by-year basis, according to assumptions used by the Office of National Statistics (2013a, 2013b).

As the future population changes and ages, demand for workforce time changes. Hence, in the next step of CfWI modelling, the prevalence of demand sources are modified over time and complexity by age to reflect changes. For example, this might be the number of people with long term mental health conditions. This helps to further modify skill hour demand.

These are then matched with any legislation that has been enacted which has the potential to affect provision of services – such as an increased demand for prevention skills to align with NHS England's service aspirations in the *Five Year Forward View* (NHS England, 2014). In the CfWI model, we can apply a productivity change factor by assigning a level of skill which acts to change the demand for workforce time.

Variations between the scenarios are caused by different changes to prevalence rates for the various sources of demand and different productivity assumptions. Sources of uncertainty in the model are also taken into account using parameters that have a range of potential future values rather than a single value. These include productivity assumptions, changes in prevalence for physical LTCs, mental health LTCs, oral health, maternal and perinatal conditions, population fertility, mortality and net migration.

Figure 9: Horizon 2035 system dynamics model overview



6. Next steps

In anticipation of reporting in full at the end of the programme, over the remainder of 2015-2016 we will be focusing on work in the following areas:

Prioritisation and exploration of themes emerging from initial results

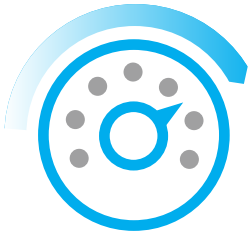
Building on the initial demand modelling we will identify the most important areas to investigate in greater depth within the scope of Horizon 2035. This will involve an analysis of model results, combined with an assessment of the policy environment. We will do this with a range of stakeholders.

Having prioritised themes for in-depth investigation, the CfWI will then analyse the wider policy context, identify the most relevant workforce groups, enhance our understanding of skills supply, and consider existing and potential workforce responses relevant to that area of priority.

Consultation and resonance with the wider system

The CfWI Horizon Scanning team will ensure that this programme continues to resonate with wider service development priorities including the *NHS Five Year Forward View* and the 'vanguard geographies'.

A high degree of stakeholder involvement will be critical to arrive at a shared view of future directions of travel and the potential for workforce planning to respond to the changes described.



Enhancing the approach and modelling

As the research considers specific themes in more depth, greater detail may be added to the skills and competence framework and modelling assumptions in those areas to explore them further both qualitatively and quantitatively. In doing so, the Horizon 2035 programme aims to develop greater resonance between the longer-term view and more familiar workforce planning territory such as workforce activity by health or care setting or disease type.

The CfWI will also continue to make refinements to the model data sources and assumptions to ensure data is up-to-date and we will also work to better quantify sensitivity in the modelling. These enhancements are not expected to change the overall messages, but will strengthen their reliability and the extent to which we can consider workforce planning options.

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This section allows you to find out more about horizon scanning at the CfWI. 'Take a tour' by viewing our instructional video which gives a brief overview of the site and how to use it. We would recommend watching the video if you are a first-time user.

If you are new to the concept of horizon scanning or are involved in workforce planning and want to learn more about how our work can help you, then visit the 'About horizon scanning' and 'What we do' pages.

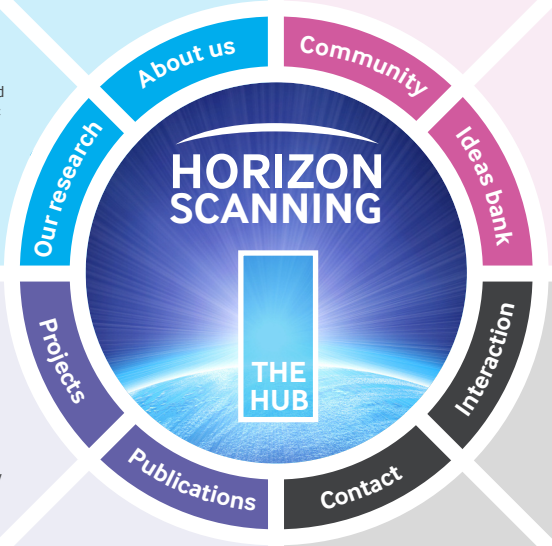
The community allows you to interact with the site and with other registered users. Here, you can hold discussions with colleagues, read and respond to thought pieces and post your own articles. You can also update your profile and review contributed items.

The community provides a forum for sharing of ideas and information, allowing you to work collaboratively with the CfWI and colleagues from across the sector, to improve workforce planning at national and local levels.

CENTRE FOR WORKFORCE INTELLIGENCE

This section provides you with a quick link to the current or recent research work undertaken by the horizon scanning team. This is at a higher level than the projects section, and looks at the whole health, social care and public health system. Here you can find out more about workshops or how to get involved.

As part of our current research, we have been commissioned to consider how the health, social care and public health workforce might look in the year 2035.



The ideas bank presents our collection of future-looking ideas about what may impact the future health and care workforce, as suggested by colleagues from across the system.

You can browse the ideas bank, to find information that is relevant for you or your organisation. You can comment on ideas, update them with your thoughts, and also add your own.

Try tagging ideas that you find interesting. You can review these in your profile area. You can also create customised baskets of ideas, which you can download as reports, to be used in workshops or shared with colleagues to help decision-making.

This section allows you to see the recent and ongoing profession-specific projects that we are working on at the CfWI.

These follow our robust workforce planning methodology which includes horizon scanning, scenario generation, workforce modelling and policy analysis.

You can explore the projects to understand how the future might shape up for specific professions. You can also follow projects, which will provide you with easy access from your profile page.

If you would like to contribute to ongoing projects, please get in touch.

Across the site there are links to Twitter, enabling you to easily tweet and share material from the site.

You can share interesting and thought-provoking pages with colleagues.

The Hub is also available on the App Store, currently for iPad only. It allows offline access to the ideas bank and projects area.

We have recently updated it so that you can also benefit from offline access to our blogs and the very latest news.

This section allows you to view and download publications by the horizon scanning team, as well as other horizon scanning-related material from the CfWI.

These publications consider a range of topics relating to workforce planning that can be used to inform and stimulate discussion, planning and decision-making.

These publications are free to access and share.

The CfWI is looking for people to contribute towards improving our horizon scanning methodology and our work. If you would like to know more about horizon scanning at the CfWI or get involved, we're keen to hear from you.

We are also looking for contributors to our new community section offering the very latest thought leadership around horizon scanning activities or similar work. We have opportunities available for guest blogs or themed discussions. All our details can be found in the section below.

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visit: www.horizonscanning.org.uk

If you are interested in attending one of our events, or in becoming involved in our projects, please get in touch on the details below.

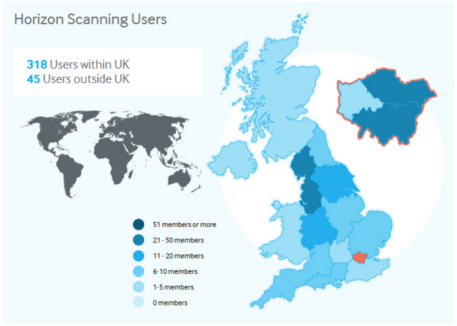
Send us an email
horizonscanning@cfwi.org.uk

Register on our horizon scanning hub
www.horizonscanning.org.uk

Call us
+44 (0) 20 7803 2707

Follow us on Twitter
@horizonscanning | @c4WI

Updates to the Hub and app:



Check out our new Community Page: The redesigned section allows registered users to easily keep track of projects of interest with a new notification board. It provides users with an easy way to see items they have contributed, projects they are following or baskets they have created. The page also features a community map, allowing users to discover members near them with whom they can interact. It also contains our latest blogs and articles.

CENTRE FOR WORKFORCE INTELLIGENCE

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