

NHS Services, Seven Days a Week Forum

Workforce and organisational development

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1. Approach

1.1 The Forum's Workforce and Organisational Development (OD) workstream was set up in May 2013 and was tasked with designing a high-level workforce model and OD framework to support the spread and adoption of seven day services, and making a preliminary analysis of its related risks.

1.2 The workstream was chaired by Raj Bhamber, Director of Organisational Development and Communications at Medway NHS Foundation Trust and supported by Camilla Gauge, NHS England Project Manager.

1.3 The workstream convened a steering group drawn from senior representation in a geographically and functionally diverse range of organisations and professional perspectives who offered case studies, personal views and guidance. The workstream also conducted a literature review, and further good practice and recommendations were sought from senior clinicians and other professionals.

1.3 NHS England also engaged specialists from Practices Made Perfect Ltd. to provide policy development and technical workforce expertise.

2. Background and context

2.1 It is important to recognise that in 2013 many organisations already deliver some degree of seven day services within their current workforce establishment, to support elective and ambulatory care, and to support discharge.

2.2 Many professionals are themselves making the case for change to system-wide provision of seven day services, and this workstream has worked closely, in particular, with the Academy of Medical Royal Colleges' *Seven Day Consultant Present Care*¹ review.

2.3 It is important also to note that provision of seven day services by organisations does not, by its nature, require seven day working by individuals. Indeed, in many cases seven day services have reportedly had a positive impact on individuals' work-life balance, offering greater certainty in planning ahead and flexibility in time off.

2.4 It should be noted that Trusts, and other employing authorities, are responsible for staff's deployment and working practices. They are also responsible for staff's contractual framework and conditions of employment.

2.5 Given the centrality of these levers in effecting strategic service change, it is recommended that NHS England consider developing formal strategic partnerships in this respect with the bodies which are responsible for these policy domains, including:

¹ Academy of Medical Royal Colleges, Seven Day Consultant Present Care, 2012

- Health Education England and Local Education and Training Boards, which include the former Deaneries, for developing strategic workforce, planning investment programmes and practice development strategies
- NHS Employers and the Department of Health for developing staff's remuneration strategies
- NHS Improving Quality for developing support programmes for Trusts' organisational development

2.6 In addition, close working relationships with the following bodies will be important:

- The Medical Royal Colleges and their collective body, the Academy
- The non-medical Professional Bodies
- The State's Regulatory Bodies

3. Scope

3.1 The initial scope for the Workforce and Organisational Development work stream was restricted to acute care services. This was broadened by the workstream's steering group to include;

- Emergency, urgent and acute admissions care
- Community care to prevent admissions and readmissions
- Primary care

4. Local workforce considerations

4.1 Although different communities of practice will wish to adopt different solutions, there may be some common local workforce issues pertaining to provision of seven day services, such as:

- Rota and shift planning for senior as well as junior doctors
- Service training balance
- Staff's contractual framework
- Staff's deployment and skill-mix
- Leadership development, particularly for clinicians
- Network roles and rotas, particularly in rural areas

4.2 **Rota and shift planning** is an essential component of effective seven day service delivery. Software packages are available which can greatly assist with complex rota and shift planning and also deliver efficiency benefits²

4.3 **Service training balance.** As noted by Professor Sir Temple in his 2010 review *Time for Training*³, "Training is patient safety for the next thirty years". Health Education England's

² NHS Employers, e-Rostering good practice case studies, 2012

³ Professor Sir John Temple, Time for Training, 2010

(HEE) *Better Training Better Care*⁴ review has shown that increased consultant presence can reduce the number of serious untoward incidents involving doctors in training and Professor Greenaway's conclusions in *Shape of training: securing the future of excellent patient care*⁵ confirm that patients and the public need more doctors who are capable of providing general care in broad specialties across a range of different settings.

4.4 Reform of consultants' **contractual framework** is a key enabler of seven day services, and the British Medical Association's commitment to support the same high quality NHS care across seven days of the week⁶ is welcomed.

4.5 Trusts looking to adopt provision of high quality care seven days a week will wish to consider developing their **skill mix** to create more generalist, cross-covering medical roles such as the physician's associate. As medical services move to seven day delivery, so too will demand for Allied Health Professionals' (AHP) services in cross-covering roles and in supporting discharge planning.

4.6 The well-being of clinicians must be considered and their **leadership development** needs met, so as to support them to deliver a seven day service from the front.

4.7 To deliver services to the clinical standards set out by the Forum across the board it is likely that transformational change will be required. **Network roles and rotas** which adapt to seven day services, for example, by sharing roles with other Trusts or creating joint rotas across primary and secondary care, will likely be required.

5. National workforce considerations

5.1 The Workforce and OD Steering Group met twice to consider;

- The scope of analysis, on Friday 24th May 2013
- The service model design and workforce issues, on Friday 9th August 2013

5.2 The steering group considered an analytical model describing the service components of seven day provision; how they relate to specialist services; principles of service integration; the OD agenda; and staffing issues, including skill mix and deployment. Members of the steering group also offered case studies, personal views and guidance.

5.3 Further information was gathered at the NHS Improving Quality seven day services Learning Exchange on Tuesday 20th August 2013 where participants mapped out the key workforce and organisational development issues concerning seven day services.

⁴ Health Education England, *Better Training Better Care*, 2013

⁵ Professor David Greenaway, *Shape of training: securing the future of excellent patient care*, 2013

⁶ BMA Position Paper, *7-day services*, 2013

5.4 In addition, summaries of best practice in developing seven day services in the following clinical areas were consulted;

- Interventional Radiology Services
- Upper GI Endoscopy Services for Upper GI Haemorrhage
- Cardiology Services
- Diagnostic and Scientific Services
- Therapy Services

5.5 Further examples of good practice and recommendations for change were made available from the Chief Scientific Officer for NHS England, Professor Sue Hill, including;

- The report of the views of Healthcare Scientists about delivering 7 day services in the North East and North Cumbria
- A Guide for Healthcare Scientists in considering delivering 7 day services
- The report of an exemplar 24-hr, 7 day microbiology service at the Royal Free Hospital, London, which also manages a national multi-disciplinary high security pathology unit for investigating patients with suspected viral haemorrhagic fever

5.6 The Report from the National Imaging Clinical Advisory Group, “Implementing 7 day working in Imaging Departments: Good Practice Guidance,” chaired by Dr. Erika Denton, the National Clinical Director, was also consulted.

5.7 Further specialist advice concerning the design and implementation of 7 day services in Pharmacy and Therapy Services was received from NHS England’s Chief Pharmacist and Chief Allied Health Professions Officer.

5.8 There is clearly no shortage of examples of good practice, advice, and guidelines concerning seven day services, but implementation appears to be patchy and inconsistent.

5.9 In light of this, the proposed OD Framework seeks to draw out development milestones in a systematic manner by drawing on Tichy’s Model of Strategic Change.

6. Building the service model

6.1 The workstream’s steering group identified a number of key issues which the framework seeks to address;

- The need to focus on maintaining flows in the acute sector by developing community services
- The need to develop comprehensive mental health services
- The need to incorporate maternity services
- The criticality of including enabling community services such as pharmacy, therapy and diagnostic and scientific services

6.2 These reflect the analysis set out in Professor Keith Willett's review of the evidence around provision of urgent and emergency care⁷.

6.3 The workstream subsequently developed a local seven day services model built around five inter-related service areas;

- Urgent and emergency care and hospital based services
- Community based care services
- Primary care services
- Regional diagnostic, imaging and science services
- Local diagnostic, imaging and science services

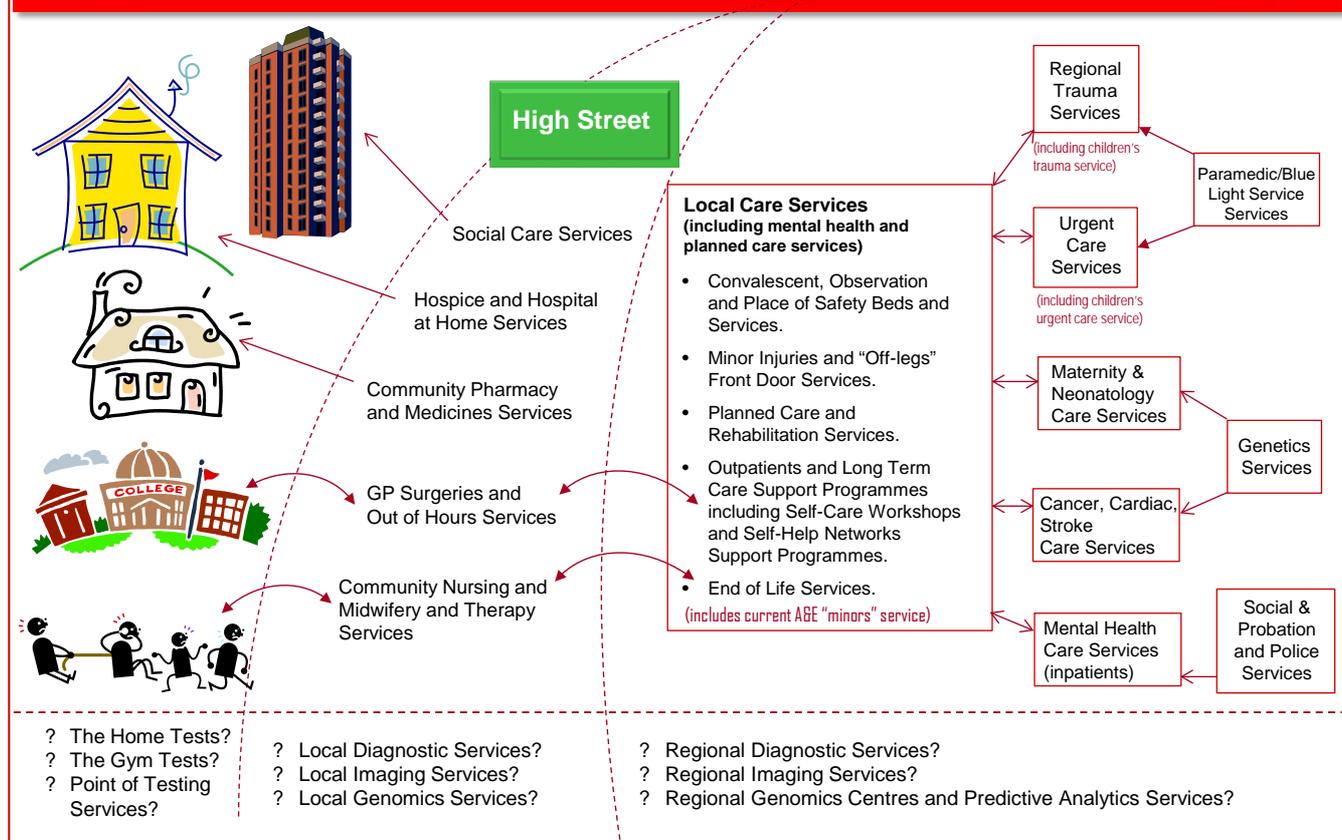
6.4 It is the workstream steering group's opinion that to develop sustained and robust local seven day services, CCGs should focus on building up comprehensive community based care services to improve and maintain patient flows in acute services.

6.5 The workstream described this service development space, which stands between the acute and home-based services, as "The Place in the Middle", which includes preventative services/self-care and assessment/triage, through to residential care, re-ablement, rapid response and intermediate care, community based care and palliative/ end of life care, acute admission and discharge and urgent & emergency care.

6.6 It is important to note that the Place in the Middle requires a firm foundation in the form of high quality diagnostic, imaging and science services to give clinical decision makers access to timely and accurate information.

⁷ For the latest on Professor Keith Willett Urgent and Emergency care review see <http://www.nhs.uk/NHSEngland/keogh-review/Documents/UECR.Ph1Report.FV.pdf>

“The Place in the Middle”



7. Locating the Change Agency

7.1 The workstream gave consideration to the appropriate change agency to develop future seven day services.

7.2 Using Ottoway’s⁸ classification, Clinical Commissioning Groups were identified as an important force for change and service development; in effect, the agency for delivering the policy goals of the seven day services programme.

7.3 The workstream considered that for the proposed Workforce and OD Framework to be useful to local commissioners, it should include;

- The Workforce and OD development milestones which Trusts and other employing authorities must achieve
- Proposed timescales for such changes
- Local financial strategy to support change

7.4 It is recommended that NHS England consider the support and development needs of CCGs in light of their central role to seven day service spread and adoption.

⁸ Ottoway, R. (1983). “The Change Agent: A Taxonomy in Relation to the Change Process,” *Human Relations*, April, 36, pp. 361-392.

8. The Organisational Development Framework

8.1 The proposed framework is presented as a change programme comprised of a three year transitional phase supported by a preparation and an evaluation year, and sets out activities around three key programmes of work; to improve patient flows, develop community services, and to underpin the system.

8.2 To **improve patient flows**, the change programme sets out activities including the mapping of urgent and emergency care flows, developing rehabilitation and resettlement services, developing diagnostic and science services, and improving multi-agency working practices in children's, elderly and mental health care services.

8.3 The change programme to **develop community services** sets out activities for cross-community leadership development and engagement groups in supporting and evaluating service development strategies.

8.4 To **underpin the system** demands new integrated transformational service and workforce models and timetables; clinical informatics, and support and development to the relevant teams to introduce them.

8.5 It is the workstream's strong opinion that one global plan will not fit all. Each CCG serves a unique area, be it a rural and/or suburban community, or a small or large conurbation. Each community will have made progress in some, and even many, areas of practice to deliver the seven day services offer. Some CCGs work as part of a bigger commissioning federation while others work as discrete local entities.

8.6 As a result, the proposed OD Framework only outlines high level indicative work programmes and development milestones, which can then be tailored to suit local circumstances.

8.7 The change programme activities are described below.

**Proposed Workforce and Organisational Development Framework
For Clinical Commissioning Groups to Drive Local Changes
The Technical Work Programme**

Goals	Preparation Year – 2014	Change Year 1 – 2015	Change Year 2 – 2016	Change Year 3 –2017	Evaluation Year 4 – 2018
<p>1. Improve Patient Flows</p>	<p>Map the urgent and emergency care flows and bottlenecks for:</p> <ul style="list-style-type: none"> • trauma and urgent care including mental health and intensivist services; • planned surgical and interventional services; • adults and elderly care services including mental health; • children's services; • maternity services. <p>Identify and work with up to 15 exemplar providers/health economies to</p> <ul style="list-style-type: none"> • Develop new models for seven day services 	<p>Develop strategies to improve flows and capacity including improving:</p> <ul style="list-style-type: none"> • consultant-led and provided service rotas and shifts; • junior-senior deployment ratios for safety; • skill-mix changes and multi-agency working; • investments in remuneration strategies; • investments in equipment and facilities. 	<p>Negotiate and pilot migration plans to move to 7-day services as defined by:</p> <ul style="list-style-type: none"> • the demand analysis; • the bottleneck analysis; • the authoritative reports; • recommended best practices; • the local resourcing plan and priorities. 	<p>Evaluate the pilots and expand their reach as defined by:</p> <ul style="list-style-type: none"> • the local priorities; • the direction orders from NHS England; • the direction orders from the CQC; • the direction orders from Monitor; • the aspirations of local clinicians and Trust Boards. 	<p>Embed new working practices and stock take progress by:</p> <ul style="list-style-type: none"> • auditing flows and bottlenecks; • auditing patient satisfaction levels; • auditing staffing costs; • auditing morbidity and mortality rates; • auditing complaints.

The Technical Work Programme

Goals	Preparation Year – 2014	Change Year 1 – 2015	Change Year 2 – 2016	Change Year 3 –2017	Evaluation Year 4 – 2018
2. Develop Community Services	<p>Map the “minors” flows and bottlenecks for:</p> <ul style="list-style-type: none"> • Convalescent, observation, and place of safety beds and services; • minor injuries and “off legs” services; • planned care and rehabilitation services; • long-term care services; • end of life services. <p>Signpost evidence from the diagnostic service reviews of 24/7 provision across England in</p> <ul style="list-style-type: none"> • Interventional Radiology • Endoscopy • Scientific services 	<p>Develop strategies to improve flows and capacity including tendering/renegotiating:</p> <ul style="list-style-type: none"> • local GP and/or Trust managed community care services; • rehabilitation and resettlement services; • hospital and hospice @home services; • out-of-hours services; • community pharmacy services. 	<p>Negotiate and pilot migration plans to move to 7-day services as defined by:</p> <ul style="list-style-type: none"> • the demand analysis; • the bottleneck analysis; • the authoritative reports; • recommended best practices; • the resourcing plan and priorities. 	<p>Evaluate the pilots and expand their reach as defined by:</p> <ul style="list-style-type: none"> • the local priorities; • the direction orders from NHS England; • the direction orders from the CQC; • the direction orders from Monitor; • the aspirations of local clinicians and Trust Boards. 	<p>Embed new working practices and stock take progress by:</p> <ul style="list-style-type: none"> • auditing flows and bottlenecks; • auditing patient satisfaction levels; • auditing staffing costs; • auditing morbidity and mortality rates; • auditing complaints.

The Technical Work Programme

Goals	Preparation Year – 2014	Change Year 1 – 2015	Change Year 2 – 2016	Change Year 3 –2017	Evaluation Year 4 – 2018
<p>3. Underpin the System</p>	<p>Map the flows and bottlenecks for:</p> <ul style="list-style-type: none"> • diagnostic and scientific services; • imaging services; • clinical informatics services within organisations; • clinical informatics services between organisations; • multi-agency working practices. <p>Engage with commissioners and providers to</p> <ul style="list-style-type: none"> • Understand their baseline position • Examine local data • Review local practice • Compare against the leaders in the field • Identify and adopt interventions 	<p>Develop strategies to improve flows and capacity including tendering/renegotiating:</p> <ul style="list-style-type: none"> • local diagnostic and scientific services; • imaging services; • clinical informatics services. <p>Develop strategies to improve multi-agency working practices in children's, elderly and mental health care services. [refer to Pollitt's checklist and details in appendix 4]</p>	<p>Negotiate and pilot migration plans to move to 7-day services as defined by:</p> <ul style="list-style-type: none"> • the demand analysis; • the bottleneck analysis; • the authoritative reports; • recommended best practices; • the resourcing plan and priorities. 	<p>Evaluate the pilots and expand their reach as defined by:</p> <ul style="list-style-type: none"> • the local priorities; • the direction orders from NHS England; • the direction orders from the CQC; • the direction orders from Monitor; • the aspirations of local clinicians and Trust Boards. 	<p>Embed new working practices and stock take progress by:</p> <ul style="list-style-type: none"> • auditing flows and bottlenecks; • auditing patient satisfaction levels; • auditing staffing costs; • auditing morbidity and mortality rates; • auditing complaints.

**Proposed Workforce and Organisational Development Framework
for Clinical Commissioning Groups to Drive Local Changes
The Cultural Work Programme**

Goals	Preparation Year – 2014	Change Year 1 – 2015	Change Year 2 –2016	Change Year 3 –2017	Evaluation Year 4 – 2018
1. Improve Patient Flows	Build communities of practice including networks Development of change/improvement skills for leading and implementing seven day services.	Support communities of practice to develop improvement strategies. Gather and disseminate learning from Early Adopter sites.	Support communities of practice to implement improvement strategies. Gather and disseminate learning across the system.	Support communities of practice to scale up improvement programmes and extend strategic partnerships. Consolidate evidence and continue to disseminate learning.	Support community of practice audit teams to evaluate their work and build the next service development strategy.
2. Develop Community Services	Build communities of practice including networks Development of change/improvement skills for leading and implementing seven day services.	Support communities of practice to develop improvement strategies. Gather and disseminate learning from Early Adopter sites.	Support communities of practice to implement improvement strategies. Gather and disseminate learning across the system.	Support communities of practice to scale up improvement programmes and extend strategic partnerships. Consolidate evidence and continue to disseminate learning.	Support community of practice audit teams to evaluate their work and build the next service development strategy.
3. Underpin the System	Build communities of practice including networks Development of change/improvement skills for leading and implementing seven day services.	Support communities of practice to develop improvement strategies. Gather and disseminate learning from Early Adopter sites.	Support communities of practice to implement improvement strategies. Gather and disseminate learning across the system.	Support communities of practice to scale up improvement programmes and extend strategic partnerships. Consolidate evidence and continue to disseminate learning.	Support community of practice audit teams to evaluate their work and build the next service development strategy.

**Proposed Workforce and Organisational Development Framework
for Clinical Commissioning Groups to Drive Local Changes
The Policy Work Programme**

Goals	Preparation Year – 2014	Change Year 1 – 2015	Change Year 2 – 2016	Change Year 3 –2017	Evaluation Year 4 – 2018
1. Improve Patient Flows	Develop the policy context: <ul style="list-style-type: none"> • Build a common purpose and momentum with key stakeholders. • Provide national co-ordination to support collaboration and partnership working • Assess the financial implications and provide national resources for local ambitions • Provide a transformational model of leadership 	Further develop the policy context: <ul style="list-style-type: none"> • Maintain common purpose and momentum with key stakeholders. • Provide national co-ordination to support collaboration and partnership working • Provide national resources for local ambitions • Provide a transformational model of leadership 	Manage and underpin transformational change process: <ul style="list-style-type: none"> • Provide support to negotiations and tendering exercises • Build a ‘social movement’ consensus around the case for change • Provide legal and arbitration services support 	Underpin the policy context: <ul style="list-style-type: none"> • Manage key stakeholders and continue to build consensus around a social movement for change • Provide continued support to collaboration and partnership working • Audit and re-assess national resources for local ambitions • Develop and revise a transformational model of leadership 	Embed transformational change: <ul style="list-style-type: none"> • Target resources at areas with ongoing change management needs • Continue to manage stakeholders • Provide legal and arbitration services support
2. Develop Community Services	Develop the policy context: Build a common purpose and momentum with key stakeholders. <ul style="list-style-type: none"> • Provide national co-ordination to support collaboration and partnership working • Assess the financial implications and provide national resources for local ambitions • Provide a transformational model 	Further develop the policy context: <ul style="list-style-type: none"> • Maintain common purpose and momentum with key stakeholders. • Provide national co-ordination to support collaboration and partnership working • Provide national 	Manage and underpin transformational change process: <ul style="list-style-type: none"> • Provide support to negotiations and tendering exercises • Build a ‘social movement’ consensus around the case for change • Provide legal and arbitration services 	Underpin the policy context: <ul style="list-style-type: none"> • Manage key stakeholders and continue to build consensus around a social movement for change • Provide continued support to collaboration and partnership working • Audit and re-assess national resources for 	Embed transformational change: <ul style="list-style-type: none"> • Target resources at areas with ongoing change management needs • Continue to manage stakeholders • Provide legal and arbitration services support

**Proposed Workforce and Organisational Development Framework
for Clinical Commissioning Groups to Drive Local Changes
The Policy Work Programme**

Goals	Preparation Year – 2014	Change Year 1 – 2015	Change Year 2 – 2016	Change Year 3 –2017	Evaluation Year 4 – 2018
	of leadership	resources for local ambitions <ul style="list-style-type: none"> • Provide a transformational model of leadership. 	support	local ambitions <ul style="list-style-type: none"> • Develop and revise a transformational model of leadership 	
3. Underpin the System	Develop the policy context: <ul style="list-style-type: none"> • Build a common purpose and momentum with key stakeholders. • Provide national co-ordination to support collaboration and partnership working • Assess the financial implications and provide national resources for local ambitions • Provide a transformational model of leadership. 	Further develop the policy context: <ul style="list-style-type: none"> • Maintain common purpose and momentum with key stakeholders. • Provide national co-ordination to support collaboration and partnership working • Provide national resources for local ambitions • Provide a transformational model of leadership 	Manage and underpin transformational change process: <ul style="list-style-type: none"> • Provide support to negotiations and tendering exercises • Build a 'social movement' consensus around the case for change • Provide legal and arbitration services support 	Underpin the policy context: <ul style="list-style-type: none"> • Manage key stakeholders and continue to build consensus around a social movement for change • Provide continued support to collaboration and partnership working • Audit and re-assess national resources for local ambitions • Develop and revise a transformational model of leadership 	Embed transformational change: <ul style="list-style-type: none"> • Target resources at areas with ongoing change management needs • Continue to manage stakeholders • Provide legal and arbitration services support

9. Strategic workforce risk analysis

9.1 A strategic workforce risk analysis is required to assess if there are sufficient trained staff available to support the proposed change programme.

9.2 Owing to time and budget constraints, the workforce and OD workstream could only conduct a high level preliminary analysis to identify the areas for further in-depth investigation. This sought to:

- i) establish design principles to support the policy question;
- ii) set out the model's dynamic forces;
- iii) request and assess the data;
- iv) build, populate and test the model;
- v) run the model and check the outputs.

9.3 Unfortunately, data to support a macro-economic model (that is, one for England as a whole, and not individual trusts) could not be acquired in the time available. That is namely;

- i) the current workload and workforce on weekdays versus that for weekends.
- ii) Workload (current activity) and workforce divided into weekday and weekend groupings at a macro level.

9.4 The workstream therefore had no basis on which to measure the variation in resourcing, relative to workloads, and therefore the changes needed to respond to different levels of activity in the future.

9.5 In light of this the workstream took a case study approach based on an analysis of Trust-level data. The workstream also conducted a systematic review of data that were made available in the form of reports and Excel-based surveys, with a particular focus on the survey responses to the financial analysis conducted by HFMA⁹.

10. Review of the data

10.1 NHS Improvement and Quality introduced a four level model in their publication Equality for all: delivering safe care seven days a week:

- i) Level one – Services limited to one department or a service that is beginning to provide some services beyond the 8am – 6pm Monday to Friday service;
- ii) Level two – Services that are provided 7 days a week, but not always offering the full range of services that are provided on week days;
- iii) Level three – A whole service approach to 7 day services that requires several elements to work together in order to facilitate clinical decision making or treatment, often covering more than one workforce group;
- iv) Level four – A whole system approach to 7 day services by integrating the elements of 7 day services across more than one speciality.

⁹ Costing Seven Day Services, August 2013, HFMA; NB: The HFMA survey was commissioned well before our work had started so it was not designed to collect the data we require, our purpose in using it was to mine it for any workforce data collected for other purposes.

10.2 The clinical standards group surveyed Trusts about their level of progress against these criteria.

10.3 The workstream used the HFMA data and the clinical standards stock take survey data describing trusts' current statuses to try to map the potential change in workforce needed to move services to level 4.

10.4 A number of documents were made available to the workstream, which were reviewed, in particular, for evidence of the potential impact of seven day working on the workforce with a focus on quantitative rather than qualitative data. Unfortunately there was not sufficient evidence to allow extrapolation of any system-wide conclusions.

10.5 As a result, for this preliminary workforce risk assessment, the workstream was limited to a simple extrapolation of the HFMA data, combined with data on the current level (1, 2, 3 or 4) of progress for each trust. A synopsis of the preliminary literature review is given below.

Synopsis of the Literature Review

Implementing 7-day working in Imaging Departments: Good Practice Guidance, 2011, Department of Health:

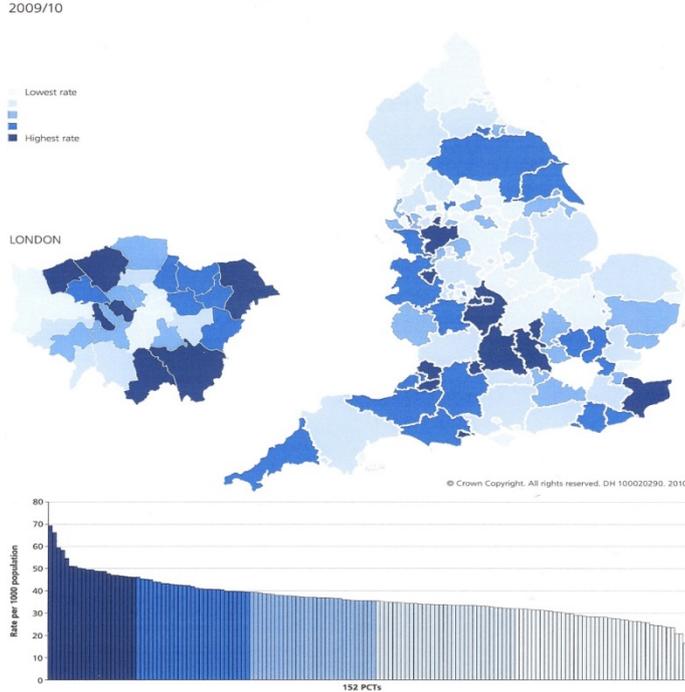
- i) In England as a whole, there is adequate physical capacity (imaging machines) to extend services to a 7-day model, although variations in capacity are inevitable from Trust to Trust. The limiting factor is the availability and cost of the workforce to run machines for more hours in the week. The report states:

'When it [the Healthcare Commission] looked at availability of services, it found that whilst imaging departments have to provide round-the-clock service for emergency patients, for non-urgent examinations they were typically open for only 40 hours a week. This was mainly because of the high marginal cost of providing staff to cover the department for longer hours than this. However, 40 hours was not always judged sufficient to cope with demand. The report also found that expensive equipment was idle for much of the week. Only 23% of departments provided routine Magnetic Resonance Imaging (MRI) services for more than 60 hours each week.'

- ii) Variations in the rate of use of MRI and CT scanners is illustrated in *The Atlas of Variation*:

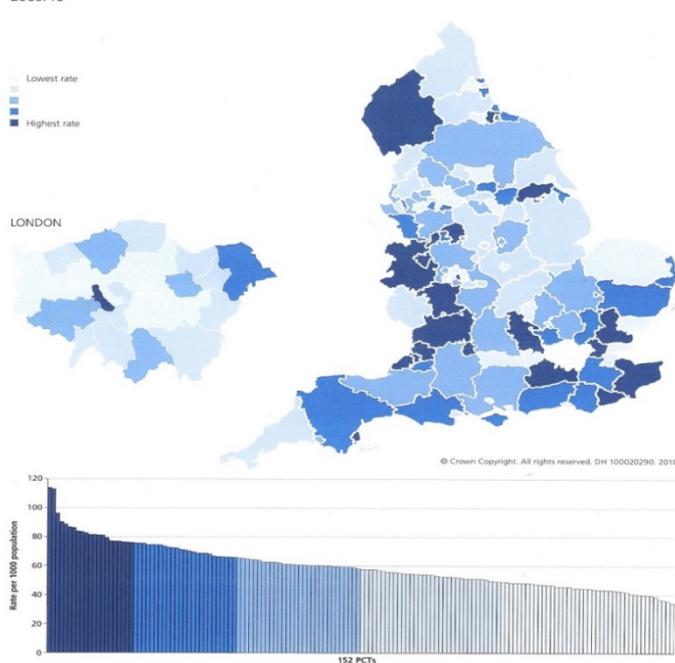
DIAGNOSTIC SERVICES

Map 31: Rate of magnetic resonance imaging (MRI) activity per 1000 population by PCT
2009/10



DIAGNOSTIC SERVICES

Map 32: Rate of computed axial tomography (CT) activity per 1000 population by PCT
2009/10



iii) But there is also evidence of the benefits of moving to an extended hours model:

'There is evidence that using imaging appropriately can reduce length of stay. In 2005 a study by Beinfeld and Gazelle¹⁰ observed that hospital costs had stabilised, despite marked increases in imaging costs and postulated that this

¹⁰ Beinfeld MT, Gazelle GS. (2005) *Diagnostic imaging costs: are they driving up the costs of hospital care?* Radiology 235:934-9.

could be attributed to a decrease in other factors such as length of stay because of the increased use of modern imaging techniques.'

- iv) The report contains a number of case studies that further illustrate the benefits gained from moving to a seven day service model for imaging. However, none provide measures of the 'as is' and the 'go to' workforce profiles, or even of the delta (the increase in the workforce needed to move to a seven day service).

Shape of the medical workforce – Starting the debate on the future consultant workforce, February 2012, Centre for Workforce Intelligence

- i) The report states that *'If employers moved to a consultant-present service then by 2020 there may be sufficient consultants to provide a consultant-present service.'* It does not put a number on this, although there appears to be an underlying assumption that by 2020 the consultant population would have grown by 60%.
- ii) This conclusion is at odds with the views of the professional bodies who predict that service demands will outstrip workforce supply.

Summary notes from the Royal College of Physicians (RCP's) medical workforce unit and medical specialties meeting, December 2012, Royal College of Physicians

- i) The document provides a stock-take of the medical workforce by discipline and in some cases a projection of increases in the short term. But there is no specific mention of the impact of seven day working.
- ii) The RCP's recent report *Future Hospital Commission*, September 2013, however makes an important contribution in that it examines the future role of medical staff in an extended service.
- iii) Similarly, the forthcoming Greenaway Report, *Shape of Training*, will help to inform the workforce analysis as it assesses the training needs of the medical workforce and its design to support a changing service model

Adult emergency services: Acute medicine and emergency general surgery. Survey of current arrangements: Summary of key findings and full responses, September 2011, NHS London

- i) The survey reveals a 'stark' variation in service provision in London, and linked reduced service provision at weekends to higher mortality.
- ii) In both acute and surgical specialities, the availability of full consultant cover and supporting diagnostics (with senior reporting) were cited as the main limiting factors.
- iii) But the report offers no data on the current workforce or the workforce demand that would be generated if seven day services are implemented.

GP in-depth review, preliminary findings, March 2013, Centre for Workforce Intelligence

- i) A move to seven day services in the acute sector will have an impact on services in primary care. Indeed, the ability for hospitals to discharge patients safely at the weekend is dependent, in part, on there being adequate support available in primary

care.

- ii) This report by the CfWI focusses mainly on the supply side of the workforce equation. The number of GPs has been growing – by at least 29 per cent between 1995 and 2011, up from 27,465 to 35,415, excluding GP registrars and GP retainers.

'The number of GPs per 100,000 population has also been steadily increasing. On a per capita basis, there were 67.8 GPs per 100,000 population in 2011, compared with 56.8 in 1995. However, the national picture hides marked local and regional variation, with access to GPs still unequal between areas of high and low deprivation.'

- iii) However, over a similar period, average appointment times have increased (from 8.4 minutes to 11.7 minutes in 2006/7) as has the average consultation rate. So demand is growing.
- iv) The report estimates that if the target of 3,250 training places per year can be achieved by 2015, then the GP population should grow by 12,800 FTE by 2030, improving GP coverage to around 83-84 per 100,00 population. This should close the demand gap.
- v) But, the demand projections in the report are based mainly on population growth, and on changes in the age and gender mix. So they do not take into account seven day working across the health economy, which suggests that even this ambitious target could fall short of meeting actual demand.

Seven Day Healthcare Science Services – A Guide for Healthcare Scientists in considering delivering seven day services, February 2013

- i) The document contains a number of case studies that illustrate the benefits of seven day working by extending working hours for elective care, achieving higher utilisation rates for equipment, and providing additional cover at weekends, all of which aims to ensure that diagnostic and therapeutic services are not a limiting factor in the efficient flow of patients through care pathways. But there are no data to underpin the case studies.

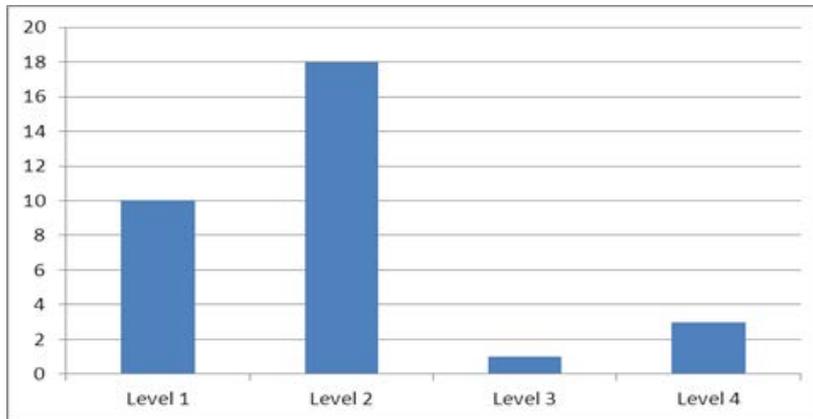
Healthcare Scientist: Seven Day Services Survey Findings, September 2013

- i) This was a mainly qualitative survey. It found that many services for pathology, medical physics and cardiac physiology are already operating over seven days, although half are only providing partial models using predominantly on-call systems for specific diagnostic tests rather than offering a whole service.
- ii) There were no data to demonstrate the likely impact on workforce numbers.

Seven day services in the North East – The view of Healthcare Scientists, July 2013

- i) This report outlines the results of a small survey conducted with healthcare scientists in the North East and North Cumbria. The majority of respondents (70%) reported that their departments had implemented services over seven days or extended hours.

- ii) Most were at level 1 or level 2, although 77% of respondents who said that their department provided seven day services also said that they thought the service met their users' needs:



- iii) Although the report contains some statistical analysis, there is nothing that can meaningfully be combined into a meta-analysis.

11. Workforce demand and supply

11.1 Supply is a function of demand. In a perfectly balanced system, supply follows demand in perfect alignment. That is, the quantity and timing of supply matches the quantity and timing of demand. There are no delays, there is no waste, and there is no under/over utilisation.

11.2 In a healthcare system, and in reality, there are constraints to supply – the extent to which professional groups will agree to varying working hours, the complexities of predicting many years in advance the size of the workforce that will be needed, the ability to respond to unpredictable fluctuations in demand, and other factors. Supply does not follow demand perfectly.

11.3 Acute care, by its very nature, creates demand seven days a week, yet the supply of resources is engineered to be constrained at weekends. This creates a built-in lag in the system – work carrying over to the following week. So demand is now deferred because of the limitations of supply – demand has become a function of supply.

11.4 This point is very relevant for the required workforce model because a move to seven day services is fundamentally about changes in supply to match demand better. These changes will have an impact on the nature of demand, which will, in turn, further influence supply.

11.5 The following simple model helps to illustrate these points. The model is over-simplified and the numbers are fictitious and intended solely to illustrate a point.

11.6 Imagine a hospital opening its doors for the first time. It has an inpatient capacity of 500. Daily demand for admissions is 120 patients on a weekday (a mixture of emergency and

elective admissions), but only 60 patients a day at weekends (emergency admissions only). A probability distribution determines when patients *should* be discharged:

Table 1 – Distribution of patient discharges

Discharge day	Probability of discharge
1	0.0%
2	20.0%
3	24.0%
4	20.0%
5	12.0%
6	6.0%
7	3.0%
8	3.0%
9	3.0%
10	2.0%
11	2.0%
12	2.0%
13	1.0%
14	1.0%
15	1.0%

So, if 100 patients are admitted (day 0), 20 would be discharged on day 2, 24 on day 3, etc. The average length of stay (LoS) is 4.7 days. That some patients are not discharged until day 15 reflects varying degrees of acuity, the unavailability of diagnostics and therapists at the point of demand, and so on.

11.7 The model now assumes that this 'natural order' is disrupted by the fact that at weekends, the hospital is only able to discharge enough patients to cope with the demand for emergency admissions. The delay for those who could be, but are not, discharged is set at 2 days:

Table 2 – Inpatient stocks and flows

Baseline	Week 1						
	1	2	3	4	5	6	7
	M	T	W	T	F	S	S
Available capacity (opening)	500	380	260	164	97	54	54
Discharged		0	24	53	77	60	60
Weekend discharge delayed						31	38
Admission demand (notional)	120	120	120	120	120	60	60
Daily demand admitted	120	120	120	120	120	60	60
Available capacity	380	260	164	97	54	54	54
Delayed admissions (cumul)	0	0	0	0	0	0	0
Delayed admissions absorbed	0	0	0	0	0		
Total admissions	120	120	120	120	120	60	60
Available capacity (closing)	380	260	164	97	54	54	54

91 patients could be discharged on Saturday, but only 60 actually are. The remaining 31 are discharged on Monday

11.8 The effect of this is stark. The delayed discharges reduce the available capacity on the following Monday. This means that the hospital cannot manage all of its expected admissions, so some admissions are delayed. The hospital also has to respond to the extra 'catch-up' work needed on Monday to relieve the backlog of discharges – demand has generated supply, which was sub-optimised at the outset (limited weekend discharges), which moderated demand (work moves to Monday) and further changed supply (more staff needed on Monday). If the model runs for several weeks to reach a steady state we can see the overall effect:

Table 3 – Inpatient stocks and flows with delayed discharges

Baseline	Week 1							Week 8						
	1	2	3	4	5	6	7	50	51	52	53	54	55	56
	M	T	W	T	F	S	S	M	T	W	T	F	S	S
Available capacity (opening)	500	380	260	164	97	54	54	0	0	0	0	0	0	0
Discharged		0	24	53	77	60	60	132	123	89	99	102	60	60
Weekend discharge delayed						31	38						40	39
Admission demand (notional)	120	120	120	120	120	60	60	120	120	120	120	120	60	60
Daily demand admitted	120	120	120	120	120	60	60	120	120	89	99	102	60	60
Available capacity	380	260	164	97	54	54	54	12	3	0	0	0	0	0
Delayed admissions (cumul)	0	0	0	0	0	0	0	197	185	213	234	252	252	252
Delayed admissions absorbed	0	0	0	0	0			12	3	0	0	0		
Total admissions	120	120	120	120	120	60	60	132	123	89	99	102	60	60
Available capacity (closing)	380	260	164	97	54	54	54	0	0	0	0	0	0	0

11.9 The spike in discharge activity at the start of the week is clear to see. As is the steady state of 40 or so delayed discharges at the weekend, and a lag of 252 delayed admissions, otherwise known as a waiting list. The model also shows that at this steady state, there is no spare capacity on any day because the system is constantly playing catch-up.

11.10 Now consider the following scenario. Weekend staffing is adjusted to allow patients to be discharged on time (in line with the probability distribution above). This has a dramatic effect. There is no longer a spike in activity at the start of the week (so the workforce can be readjusted accordingly). There is even spare capacity on some days. There are still some delayed admissions because only emergency admissions are accepted at weekends and any residual capacity is not being used on the day it becomes available. But the volume of delayed admissions (the waiting list) is very much lower. It is implicit in Scenario 1 (below) that the resources necessary to facilitate discharge, such as diagnostics, consultant sign-off, community support where needed, and so on, have been put in place (the supply-side adjustment needed to match more closely the flow of demand):

Table 4 – Scenario 1

Scenario 1	Week 1							Week 8						
	1	2	3	4	5	6	7	50	51	52	53	54	55	56
	M	T	W	T	F	S	S	M	T	W	T	F	S	S
Available capacity (opening)	500	380	260	164	97	54	85	94	0	0	0	0	0	48
Discharged		0	24	53	77	91	98	96	87	103	107	109	108	106
Weekend discharge delayed						0	0						0	0
Admission demand (notional)	120	120	120	120	120	60	60	120	120	120	120	120	60	60
Daily demand admitted	120	120	120	120	120	60	60	120	87	103	107	109	60	60
Available capacity	380	260	164	97	54	85	123	70	0	0	0	0	48	94
Delayed admissions (cumul)	0	0	0	0	0	0	0	74	37	54	67	78	78	78
Delayed admissions absorbed	0	0	0	0	0			70	0	0	0	0		
Total admissions	120	120	120	120	120	60	60	190	87	103	107	109	60	60
Available capacity (closing)	380	260	164	97	54	85	123	0	0	0	0	0	48	94

11.12 So a further scenario may be considered. Scenario 2 is based on Scenario 1, but if it is assumed that work is smoothed throughout the week (an unrealistic aspiration in reality, but let's assume that elective admissions can be manipulated to ensure as smooth a flow as possible when combined with emergency admissions). It is also assumed that dependent services (diagnostics, therapy, community support, and so on) are available at the point of need not just for the purposes of discharge, but also for the purposes of treatment (so all interdependent services move to seven day working). This has the effect of reducing the LoS to 3.7 days according to the following probability distribution:

Table 5 – Distribution of patient discharges with reduced length of stay

Discharge day	Probability of discharge
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1	0.0%
2	27.0%
3	30.0%
4	23.0%
5	9.0%
6	4.0%
7	2.0%
8	1.0%
9	1.0%
10	1.0%
11	1.0%
12	1.0%
13	0.0%
14	0.0%
15	0.0%

11.13 The same number of patients are being treated each year. But the number of bed-days is reduced. And the impact of smoothed patient flow is zero lag in the system. In fact, the hospital could manage its demand with fewer beds as there is a steady state of available capacity. This illustrates the importance of understanding not just the number of patients managed in the course of a year (completed episodes of care), but also the periodicity of the care provided – in other words, **a model for seven day services will have to take into account the effect of changes in the length of stay.**

Table 6 – Scenario 2

Scenario 2	Week 1							Week 8						
	1	2	3	4	5	6	7	50	51	52	53	54	55	56
	M	T	W	T	F	S	S	M	T	W	T	F	S	S
Available capacity (opening)	500	397	294	219	175	154	143	121	121	121	121	121	121	121
Discharged		0	28	59	82	92	96	103	103	103	103	103	103	103
Weekend discharge delayed						0	0						0	0
Admission demand (notional)	103	103	103	103	103	103	103	103	103	103	103	103	103	103
Daily demand admitted	103	103	103	103	103	103	103	103	103	103	103	103	103	103
Available capacity	397	294	219	175	154	143	136	121	121	121	121	121	121	121
Delayed admissions (cumul)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delayed admissions absorbed	0	0	0	0	0			0	0	0	0	0		
Total admissions	103	103	103	103	103	103	103	103	103	103	103	103	103	103
Available capacity (closing)	397	294	219	175	154	143	136	121	121	121	121	121	121	121

11.14 A hospital and its patient flows are far more complex than this simple model describes. But, the general principles revealed through the stocks and flows of the model hold true. All that has happened is the removal of supply-side constraints in a hypothetical system to allow observation of the impact that this had on the stocks and flows of patients. A model for seven day services will need to illustrate the impact of removing current supply-side constraints and the knock-on effect of changing supply to improve flow.

11.15 To model the future workforce demand it is necessary to start with a projection of future activity. This must include the acute activity that falls within the scope of the analysis for seven day services, plus the associated diagnostic, therapeutic and community activity that is needed as an enabler. The workstream proposes a number of categories including emergency care, planned care, maternity and gynae, GP and community, diagnostic and therapeutic services. The current and future workforce will need to be mapped to the activity.

In all cases, data will need to differentiate between activity that starts on a weekday and that which starts at a weekend, and be mapped to workforce groupings such as doctors (consultants, CCT grades, staff grades, junior doctors, GPs), nurses, therapists, paramedics, pharmacists and healthcare scientists; broken down into appropriate sub-groups.

11.16 A basis for calculating supply-side pipelines is yet to be determined – whether to keep the model simple at this stage or to create a detailed pipeline model. However, a number of modelling parameters have been defined (the levers and brakes that define forces for change) that will influence demand and supply in the short to medium term. By quantifying these it will be possible shall be able to create projections under different scenarios.

11.17 Growth trends may be calculated, to derive activity levels for each year. The trends will be extrapolated from the data for years t-5 to t5, plus a factor for population growth and a factor for growth in the elderly population (both to be derived from ONS data).

12. Next steps

12.1 Extending the NHS Services, Seven Days a Week Forum costing survey to include specific data on workforce issues and a wider sample of Trusts would allow the construction of a robust picture of the potential financial impact of seven day services while providing important information on the scale and pace change to the workforce model above. This should be in alignment with the NHS Improving Quality Early Adopter Seven Day Services Improvement Programme and Urgent and Emergency Care Review.

12.2 Thereafter, extending the Centre for Workforce Intelligence's workforce analysis methodology further to take account of the Major demand-side shifts as a result of: the Greenaway Report; the Royal College of Physician's Future Hospitals Commission Report, and the Academy of the Royal Colleges Medical Workforce Report, would allow policy makers to triangulate locally derived workforce risk analyses with those derived from macro-economic national level modelling.