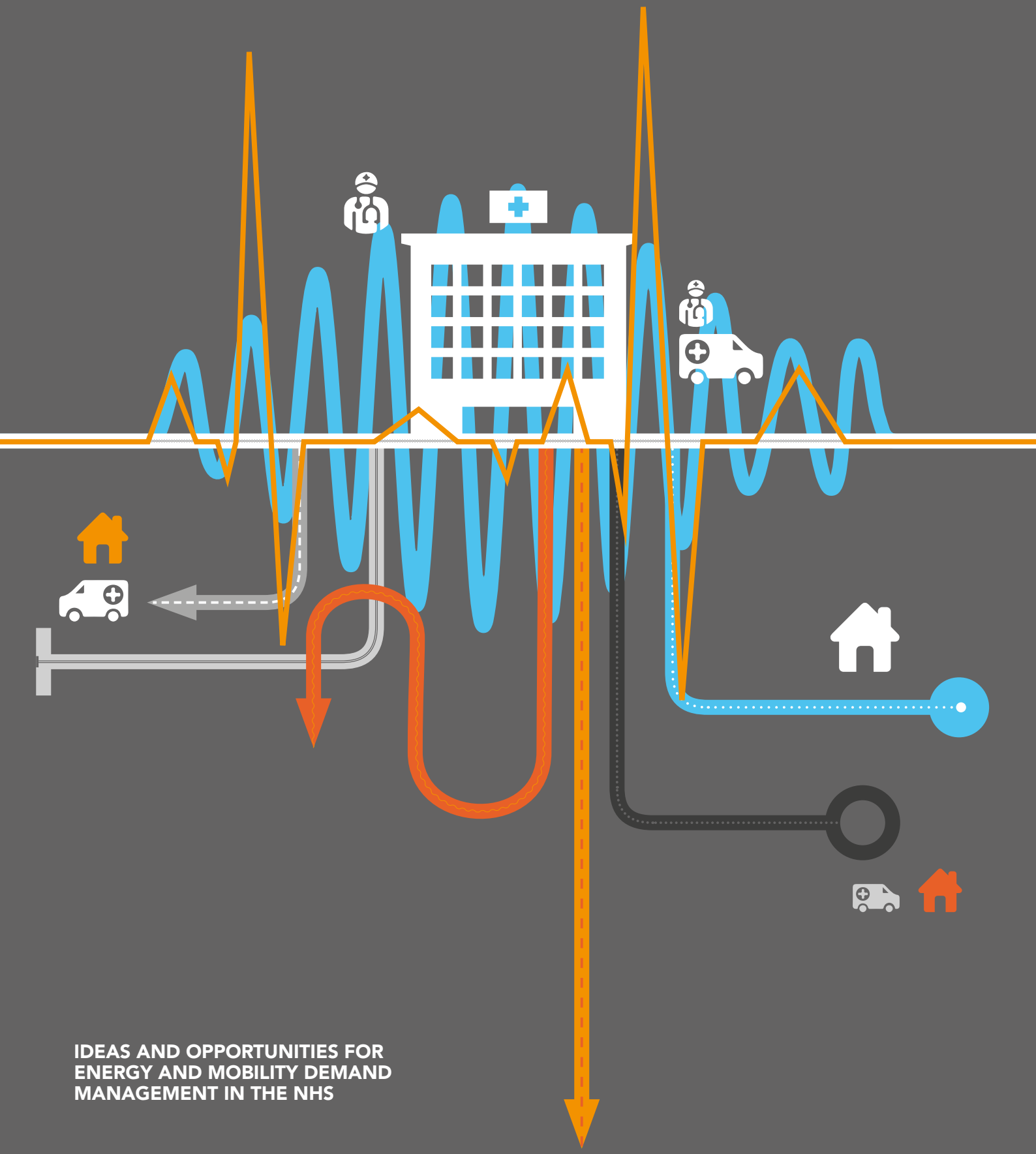
INSTITUTIONAL RHYTHMS



IDEAS AND OPPORTUNITIES FOR ENERGY AND MOBILITY DEMAND MANAGEMENT IN THE NHS

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DEMAND
DYNAMICS OF ENERGY, MOBILITY AND DEMAND

Introduction

The NHS is the largest public sector contributor to climate change in Europe.[1] Despite efforts to promote sustainable development, it is as yet unclear how the NHS will meet its carbon emissions reduction target of 80% by 2050.[2]

One problem is that strategies for sustainable development rarely engage with the fact that hospitals *make* demand for energy, transport, and goods through the organisation of the services that they provide. This is partly because hospital managers usually think that the demand for resources like energy, as well as the demand for healthcare services, is something over which the hospital has little control and to which it has to respond.

It is therefore common to focus on ways of reducing energy consumption through investment in energy saving technologies, such as more efficient boilers, and persuading staff to reduce the energy they use by closing windows and turning off PC monitors. At the national scale, strategies for bringing about future carbon reductions include measures to decarbonise the production and distribution of electricity.

These responses overlook the fact that demand for energy, travel, and goods is an outcome of everyday working arrangements.

Another approach is to start by asking how hospitals make demand for resources. This takes issues of sustainable development to the heart of hospital processes, procedures, and practices and helps identify ways of modifying working arrangements as a method of shaping patterns of consumption and demand.

How energy is used, and what it is used for, depends on what is happening in the hospital and when. Hospital schedules therefore matter for the synchronisation of energy demanding activities and hence for carbon intensive and costly peaks in energy use and for peak travel and congestion.

The timing and synchronisation of healthcare services is critical not only for these problematic peaks but also for processes and procedures that matter for the overall demand for energy and travel in the hospital.

For example, hospital schedules depend on tightly interconnected sequences of regular activities that occur within and beyond the hospital. Not only that, some procedures have to come before or after others. Some are more flexible and can be done at different times. On the ward, consultant rounds may come before and after protected meal times. Meanwhile, on-site sterile services often pick up the majority of their work as operating theatres come to the end of afternoon lists. There are many more complicated sequences that exist and extend beyond meal times and beyond the day and that also matter for weekly, monthly, and annual hospital timetables.

The frequency, pace, and synchronisation of these sequences are influenced by cycles beyond the hospital. For example, discharge processes follow a modified sequence at the weekend when fewer staff are available. Over the course of the year, school holidays matter for when clinicians' take their annual leave, and so for the numbers of clinics and related activities that go on in the summer.

This intersection between sequences and cycles within and beyond the hospital is directly reflected in weekly energy load and annual procurement profiles. Changing the timing of ordinary working arrangements changes peaks in energy and travel. Re-arranging sequences can help reduce the total number of patient journeys and can also enable a more efficient use of hospital time and space.[3]

Reducing peaks and minimising carbon emissions in these ways depends on thinking about issues that are key for sustainable development but that are often overlooked. It means focussing on the *Institutional Rhythms* that underpin the organisation of hospital life, the sequences and systems of professional responsibility that hold these arrangements in place, and the patterns of demand for energy and travel that follow.

This briefing paper illustrates new ways of thinking about energy and travel demand in the NHS and draws on research with three hospitals[4] to provide examples of what these ideas mean in practice.

It identifies opportunities for bringing together expertise and resources in clinical and operational design, sustainable development, and financial planning in order to reconfigure sequences, cycles, and ways of working that reduce energy demand and costs to the NHS and that also improve patient care.

Example 1 Sequences and Hospital Discharge

Delayed transfer of care is a complex institutional problem for the NHS. Increased length of stay severely impacts patient care and health, and it has significant financial implications. Delayed discharge is also important for sustainable development. Hospital occupancy studies reveal the potential for reducing energy consumption and carbon emissions through the effective and efficient use of hospital time and space to improve hospital 'energy performance'.[5]

Responses to issues relating to delayed transfer of care usually focus on the limited availability of care-home beds. While the availability of social care is fundamental for hospital discharge, research shows that increases in care-home beds only have a modest effect on reducing delayed discharges[6] and that the majority of delayed transfers of care are attributable to the NHS.[7]

This prompts us to think about how hospital schedules affect discharge times. While patients are admitted to hospital at all times of day and night, they are most likely to be discharged between 3pm and 6pm. How do hospital schedules and working arrangements *make* this peak?

One answer is that discharge times are defined by the sequencing and the timings of different steps (including senior sign off, the preparation of take home medicines (TTOs), home check, etc.). The writing up of doctors' notes and the preparation of TTOs are often pinch points in the discharge process.

Some of the options that are already considered to facilitate discharge are to reconfigure sequences and reduce the number of steps involved: to hold ward rounds later in the day so that TTOs can be prepared overnight; to use IT to reduce time spent completing paperwork; and to delegate authority so that more junior staff can sign off on appropriate cases. Changing the way that junior doctors write up discharge letters can help to spread the times of preparation for TTOs and relieve afternoon pressures on pharmacies.

Another issue is that 'outliers' (patients located in the wrong ward as a result of space limitations) are sometimes missed from specific consultant ward rounds meaning that some patients stay in hospital for longer and that capacity for bed flow is reduced. One strategy to both reduce patient length of stay and improve bed flow on and between wards is to prioritise 'outliers' on consultant rounds.

And of course, for a patient to be discharged, TTOs, home care, and transport all have to be ready at the same time. Some of the strategies for synchronising these services are to classify needs for discharge on admission to be able to arrange services like patient transport and home check in advance.

Hospital discharge, resources related to patient length of stay, and peaks in demand for travel and energy depend on a synchronisation of these hospital services. Strategies for shifting discharge times are only likely to have systematic effect when sequences are understood and reconfigured alongside the total temporal organisation of the hospital.

Example 2 Boundaries of Professional Responsibility and Patient Transport

Increasing pressures on UK ambulance services often result in longer hand overs and, at peak times can result in log-jams of idling ambulances outside the hospital waiting to admit patients. This kind of congestion contributes to further delays in patient care, has further consequences for timely discharge, and for the ability to manage other peaks in demand for patient transport.[8] As 18% of carbon emissions in the NHS are related to travel,[9] maintaining a timely and efficient patient transport system is a central issue for sustainable development strategies.

Responses typically focus on how to make vehicles more energy efficient. There are also opportunities to reconfigure sequences of activities so as to reduce demand for patient transport.

One way of facilitating the smooth flow of patients into hospital is to pay attention to what is involved in the delivery of care upstream of the hospital entrance and how boundaries of professional responsibility are organised.

The professional remit of paramedic staff is to stabilise patients so they can be transported to hospital where they can receive treatment. Distinctions between the professional responsibilities of ambulance and hospital staff require that certain procedures are performed when patients are 'handed over' and that certain kinds of care happen in the hospital: not surprisingly this matters for patient care and for ambulance waiting times.

One method of managing demand and the flow of patients, and of reducing queuing and congestion, is to re-arrange the timing and location of some of these procedures. For example, changing when and where assessment of need, triage, and care occur. This depends on reshaping the boundaries of responsibility that currently hold sequences of healthcare delivery in place.

Some options are already being trialled and implemented, often as stand-alone schemes and usually with the aim of reducing hospital admissions only, rather than in conjunction with the ambition of reducing congestion and transport-related carbon emissions.

Such strategies include moving more hospital services into the community or the home. Home First[10] is an example of such a scheme that aims to reduce A + E attendance and unplanned hospital admissions by providing rapid response services with a different mix of skills and equipment to provide home care.

Other options include supporting new kinds of career training and job sharing between hospital and ambulance staff to develop skills that might also enable more patients to be treated at home.

In other cases, the flow of patients between ambulances and the hospital might be further facilitated by specially trained ambulance staff commencing investigations and interventions while patients are waiting to be admitted as a way of speeding up the transfer of care and treatment processes for patients.

These illustrations show how boundaries of responsibility matter for patient transport and for resource and energy demand. They also show that there are therefore opportunities for rearranging systems of professional responsibility as a means of reducing patient transport, managing congestion, and reducing associated carbon emissions.

Implications

These two examples of hospital discharge and patient transport underline the point that demand for resources is made through the organisation of hospital services. They show that timing, sequencing, and responsibility are central topics for sustainable development.

Attending to these issues means expanding what counts as sustainable development in the NHS in order to seriously engage with (what are currently) invisible energy procedures, policies, and practices.

Addressing complex institutional problems like these will require extending the sustainable development agenda to include input from transport and hospital planners, operations designers and sustainability managers, clinicians and estates managers.

The goals of such an extended agenda are to develop working arrangements in ways that embed more sustainable sequences and procedures that reduce demand and at the same time improve patient care and reduce costs to the NHS.

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[4] This briefing paper is based on research with Airedale General Hospital, Blackpool Victoria Hospital, and Leeds Teaching Hospitals NHS Trust, as part of the Institutional Rhythms project and part of the DEMAND Research Centre at Lancaster University. See www.demand.ac.uk/institutionalrhythms

[5] Bacon M. (2014) *Occupancy Analytics: A New Basis for Low-Energy–Low-Carbon Hospital Design and Operation in the UK.* Architectural Engineering and Design Management 10.

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[8] See for example, the impact of seasonal variation in ambulance call-out and response times: Thornes JE, Fisher PA, Rayment-Bishop T, et al. (2014) *Ambulance call-outs and response times in Birmingham and the impact of extreme weather and climate change.* Emergency Medicine Journal 31: 220.

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[10] http://www.enhertsccg.nhs.uk/homefirst

DEMAND Institutional Rhythms Ideas and Opportunities for Energy and Mobility Demand Management in the NHS
Further reading: http://www.demand.ac.uk/institutionalrhythms
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