

Using data to identify good-quality care for older people

Research report

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About this report

There is a large amount of variation in the quality of care that is currently delivered to older people across England. Numerous initiatives by various bodies have been set up with the aim of improving care, but much of the evidence of their effectiveness remains anecdotal. Furthermore, when multiple health or care improvement activities are in place in one area, it is not always clear which parts improve outcomes and which do not. In the absence of useful data to show that an activity is working to improve care, it may be useful to approach from the other direction by starting with the data and asking whether certain patterns visible in routine data are good at identifying activity that improves quality of care. If they are, then we may have a way of identifying activity that might otherwise be overlooked.

This report describes the results of some pilot analysis to ascertain the usefulness of this approach, using a few indicators that were mainly derived from acute emergency hospital use. The aims were to test out ways of using data to identify potential success; to understand the challenges of attributing data findings to real-world activity; to judge the feasibility of extending into wider work; and to inform what this wider work should look like.

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Key points

- It is possible to use routine data to identify significant changes over time that may relate to improvements in quality of care.
- There is not always a straightforward link between improvements in reported outcomes and changes in the way services are being delivered. These links may exist, but they are not necessarily easy to find.
- In local areas there can be numerous innovations for changing service provision that run concurrently. How these interact may have a more important impact on outcomes than any one activity on its own. Also, the prominence given to certain of these over others may influence people's perspectives on what has been important.
- Much can be gained if local areas are able to make more use of time series to monitor changes against their own past history, particularly for the prospective evaluation of new initiatives for improving care.

Introduction

There is a large amount of variation in the quality of care that is delivered to older people across England. Numerous initiatives – whether implemented by hospitals, local authorities, clinical commissioning groups (CCGs) or general practices – have been set up with the aim of improving care. However, much of the evidence of their effectiveness is anecdotal, and when multiple health or care improvement activities are in place in one area, it is not always clear which parts improve outcomes and which do not. Moreover, some of the most effective activity could be going unreported.

If an activity is working to improve care, then there may be data available with which to identify that this is happening. But this may not always be the case. Instead, we may need to rely on proxy indicators within routine data, such as a reduced frequency of admissions to hospital. However, we can also approach this from the other direction by starting with the data and asking whether certain patterns visible in routine data are good at identifying activity that improves quality of care. If they are, then we may have a way of identifying activity that might otherwise be overlooked. Furthermore, by establishing useful indicators, local teams would have a valuable means for monitoring performance and effectiveness.

But we need to be careful about relating data to quality of care. What we see in the data may not reflect what is happening on the ground, and there is a danger of over-interpreting what we see at face value – for example lower-than-expected mortality or hospital admissions rates (Taylor and Aylin, 2014; Lilford and Pronovost, 2010). Often the more important question is how well changes in such measures reflect improvements in care that may be happening, rather than any value they may have as absolute measures of quality (Sherlaw-Johnson and Bardsley, 2016).

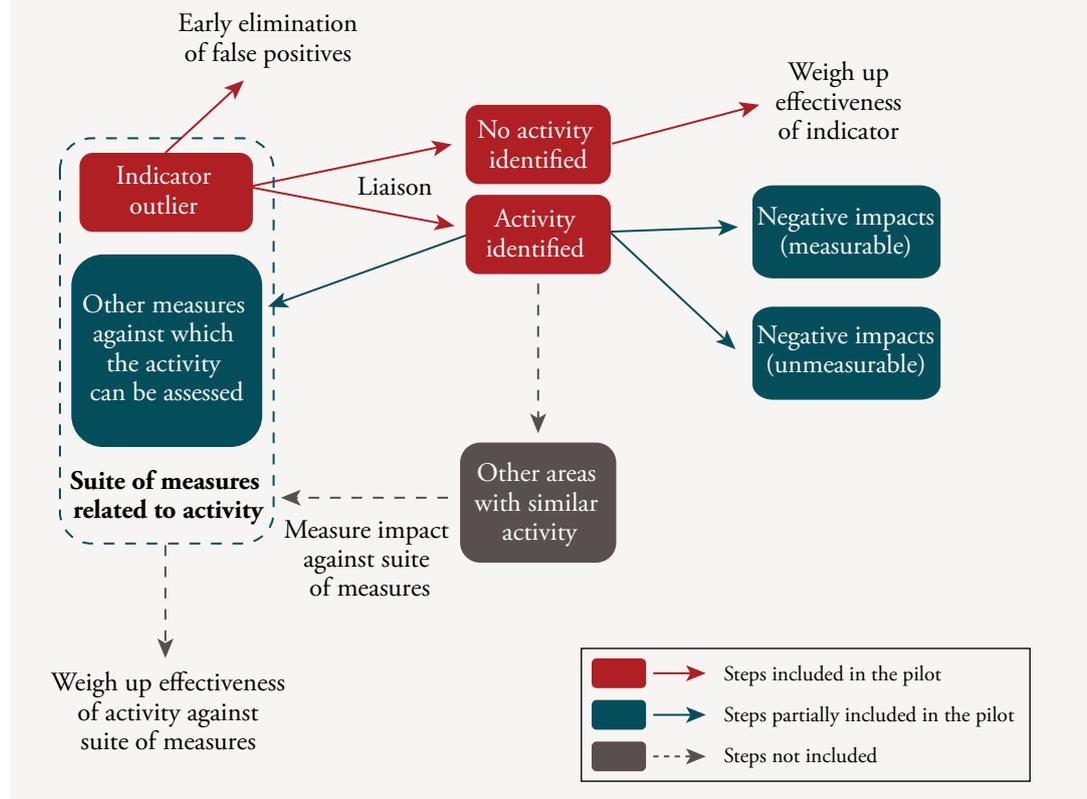
This is not just about selecting the right indicators, but also the right methods. Snapshots presented for one time period using, for example, a funnel plot are of limited use when looking for evidence of improvements. It would be preferable to analyse time series so that, for example, the areas or units of concern can be compared against their past history. Baskets of indicators may also be useful, enabling us to view patterns across several indicators at once rather than analysing single measures in isolation (Spiegelhalter and others, 2012).

In this report we describe the results of some pilot work using a few indicators mainly derived from acute emergency activity. Our aims were to:

- Test out ways of using data to identify potential success
- Understand the challenges of attributing data findings to real-world activity
- Judge the feasibility of extending into wider work
- Inform what this wider work should look like.

A wider project framework is shown in Figure 1, which highlights the stages that we undertook in the pilot.

Figure 1: Overview of process for handling indicators



The act of exploring the link between the data and local activity to improve the health and care of older populations requires particular types of engagement with local organisations, and there may be several organisations involved. We need to be able to understand how well observations from the data are a consequence of what is happening locally and whether we can be confident that the data is reflecting the success of local activity, or whether any matches are coincidental.

Methods

The stages for the pilot project were planned as follows:

- Choose indicators for analysis
- Choose methods for analysing the data
- Analyse the data
- Identify areas for follow-up
- Engage with relevant people within the chosen areas
- Review feedback
- Identify potential further work.

Indicators

Our first aim was to select indicators suitable for following up with local organisations. We wanted these to be straightforward to generate from routine data and such that sudden changes or positive trends in the data could reflect the success of local initiatives to improve care for older people. The indicators we chose covered the broad areas of emergency inpatient visits and attendance at A&E and focused on people aged 75 or above. Our unit of analysis was the local authority of residence. The primary list of indicators is displayed in Table 1.

Table 1: Indicators analysed during the pilot project

Area of interest	Specific measure
Emergency inpatient admissions for people aged 75 or over	<ul style="list-style-type: none"> – Individuals with a primary diagnosis of: <ul style="list-style-type: none"> • any condition • chronic obstructive pulmonary disease • urinary tract infection • fractured neck of femur – Individuals with more than three emergency admissions in a year – Individuals with at least one emergency admission in a year – Bed days in a year
A&E attendances of people aged 75 or over	<ul style="list-style-type: none"> – Number of attendances to A&E – Patients with 10 or more visits in a year – Out-of-hours attendances – Re-attendance within seven days – Re-attendance within 30 days

Data for these indicators were extracted from Hospital Episode Statistics (HES). We considered all emergency activity in this older population and activity specific to three conditions – chronic obstructive pulmonary disease (COPD), urinary tract infection (UTI) or fractured neck of femur (FNOF). These specific diagnoses were selected as ones where changes in attendance patterns might reflect specific types of local initiative related to the care of older people. For example, trends in emergency admissions for FNOF may reflect a new policy on falls prevention, or trends in UTI might be reflective of better management of older people with multiple comorbidities. Further details on the selection of patients from HES are described in Box 1.

Box 1: Details on patient selection from HES

All patients	We excluded patients who were admitted and discharged on the same day. This eliminated lower-risk patients who might be temporarily admitted from A&E and others admitted to assessment units where attendance is recorded in the inpatient data.
Patients with COPD, UTI or FNOF	Primary diagnosis in the admission episode or the second episode if the admission diagnosis was a symptom or sign (ICD10 chapter 'R') and a second episode existed.

Other indicators were analysed, but only after we had selected the areas we wished to follow up. Their purpose was to provide further context, for example area-level life expectancy, falls admissions data (Office for National Statistics, 2014; Public Health England, 2014).

For emergency admissions we analysed data over nine years (2005/6 to 2013/14), viewing it as a time series in order to identify patterns that may suggest improvements in outcomes. These patterns may appear as sudden changes or as gradual trends suggesting a persistent improvement over the period. With A&E data, reporting has not been uniformly reliable until the most recent years, making it difficult to identify long-term patterns.

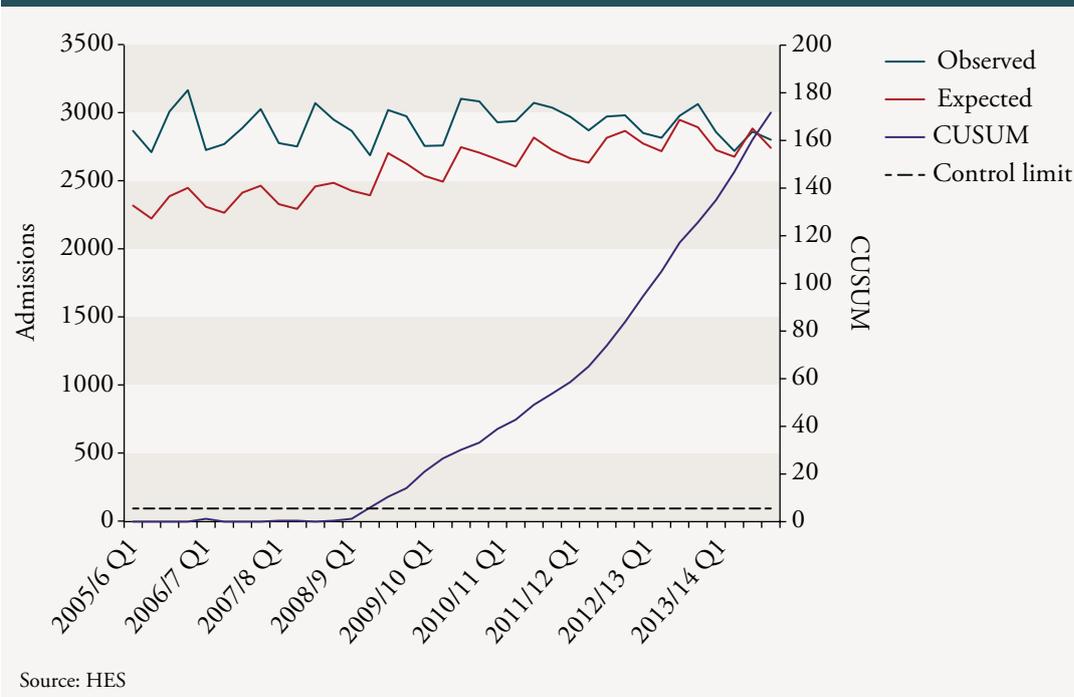
For this pilot work, we chose the local authority area as our unit of analysis in order to allow us to analyse rates across a well-defined population. Changes in hospital activity may better reflect initiatives that are implemented at the local authority or CCG level, but the impact of more localised practice-level activity would not be so easy to detect. The local authorities were restricted to England, and where they were shire counties, we used the entire county rather than splitting them into their sub-districts. This provided us with 152 separate authorities for analysis.

We used indirect standardisation to adjust for age, sex, deprivation and, where appropriate, proximity to a hospital bed. Deprivation was measured by deciles of the Index of Multiple Deprivation (IMD) for the Local Super Output Area (LSOA) of residence. The reason for including a proximity or distance to a hospital bed measure was to allow for the fact that, in many cases, the likelihood of an emergency admission will depend on accessibility to hospital care (Roberts and others, 2014). For each condition, we tested the relationship between the potential adjusting variable and outcomes before deciding to use it. Denominator populations by LSOA, age and sex came from the Office for National Statistics (ONS).

The method we used for analysing time series of emergency admission rates was the cumulative sum (CUSUM) technique. This is primarily a method used for monitoring time series prospectively. It enables us to compare the observed admissions each month against what would be expected, with the effect of any important differences accumulating over time (Steiner and others, 2000; Bottle and Aylin, 2008; Sherlaw-Johnson and others, 2016). CUSUM values are derived from log likelihood ratios between an assumption of no difference with expected values and an assumption that differences are of a pre-specified value. If the data suggest that a true difference is more likely, then the CUSUM plot will rise. Alternatively, the CUSUM plot falls until it reaches zero. In effect, we are weighing up the evidence that the underlying admission rate is actually higher than expected against the evidence that what we are seeing is just random variation about the expected value. If observed values are persistently higher than expected, then the CUSUM reaches a signalling threshold where we accept the evidence for a higher underlying admission rate. These signals are the triggers for follow-up, and the CUSUM has particular advantages over similar techniques in the speed of its ability to detect whether true changes have occurred (Steiner and others, 2000).

In this study we applied the CUSUM technique retrospectively to find signals in hospital indicators over the period from 1 April 2005 to 31 March 2014 using the methodology described in a previous study (Spiegelhalter and others, 2012). As well as providing us with important information about deviations from expected values, they also gave us the ability to explore when changes might have occurred and whether they were sustained. Figure 2 illustrates an example of its use and shows how the CUSUM plot relates to differences in observed and expected outcomes.

Figure 2: Trends in the observed and expected emergency admissions for those aged 75 years and over in Liverpool, 2005/06 to 2013/14



Rather than comparing admissions within a local authority against national rates, we compared against the national trend. In essence, we were looking for deviations from the national trend that suggested areas were improving relative to elsewhere. So, in the example shown in Figure 2, expected values have been calculated by applying the national admission rates to the Liverpool data, after standardising for age, sex, deprivation and proximity to a hospital bed. Compared to the national rate, emergency admissions started off relatively high in 2005/06 and remained constant while expected values increased. The decline in the deviation from the national trend is reflected in the increasing CUSUM. The CUSUM crosses the control limit in 2008/09, which indicates that notable improvements were appearing relatively early from around 2008/09.

For the A&E data, we only have a series starting from 2011/12, the first time that reporting levels were high enough to compare different parts of the country. Our local authority comparisons are therefore only for 2013/14, and we identified areas where attendance was particularly high.

Local follow-up

Having obtained a collection of outliers and CUSUM signals, the next stage was to select local authority areas we wanted to follow up. The follow-up process would be carried out using a combination of document review and local interviews to obtain information on any quality improvement initiatives for older people over the specific time period of interest. Before deciding on areas for follow-up, we made sure that we excluded any signals that were due to clear data anomalies, such as missing data, or where there was evidence that any changes were not sustained.

For this pilot we chose five local authority areas. We collated the information we had from our analysis together with complementary measures (such as falls data, admissions from care homes) and soft intelligence. We then used this information to formulate questions to ask local health care professionals.

Chief sources of soft intelligence were local Joint Strategic Needs Assessments, local Health and Wellbeing Strategies and strategic plans from relevant CCG and local authority websites – key strategic documents in which local areas set out their health priorities. Current and historic versions of these documents were sought, although it was not possible to locate each of these for all areas of interest. We also browsed the websites of national organisations, from which we identified examples of good practice. Specifically, these included NHS Improving Quality, the Social Care Institute for Excellence and the Royal College of Physicians. We also browsed Google and NHS Evidence using relevant search terms.

Our aim with the follow-up was to investigate the link between what we found in the data and any changes in practice on the ground. A generic framework for each discussion is outlined in the Appendix. In the first instance we aimed to talk to representatives from the CCG, the local hospitals and the local authority, who in turn might then lead us to further relevant people.

We asked for documents they could share, such as strategic plans, service specifications or any local evaluations they had carried out. Where our contacts did mention new initiatives, we matched the timing of these against our analysis to see whether they

coincided with our historic data. Understanding more about their local activity would also lead us to other indicators where, if the activity was a success, we might also see improvements.

An outline of our engagement questions is presented in Box 2.

Box 2: Outline of local engagement questions

Can they provide documents they could share (strategic plans, service specifications, local evaluations)?

Can they provide us with a better understanding of:

- the range of local health and social care activity to identify activities that operate at different levels (primary, secondary and social care)
- any physical changes in provision of care over the period of interest (e.g. hospital closure, new community clinic opening)?

Can local leaders consider how much the data reflects changes in local initiatives to improve care?

Can they:

- share any local evidence to support impact (e.g. service specifications, local evaluation)
- help identify additional measures they would have expected to have seen change
- help identify measures that may enable us to observe possible negative implications?

Results

The five local authorities we chose to follow up are shown in Table 2 together with the measures for which they signalled for potential improvements in our analysis.

Table 1: Indicators analysed during the pilot project

Area	Trends suggesting improvements may have occurred
Camden	<ul style="list-style-type: none"> • All emergency admissions • Emergency admissions for COPD • Emergency admissions for FNOF • Individuals with at least one emergency admission in a year • Emergency bed days
Liverpool	<ul style="list-style-type: none"> • All emergency admissions • Emergency admissions for COPD • Emergency admissions for UTI • Individuals with at least one emergency admission in a year • Individuals with more than three emergency admissions in a year
Northumberland	<ul style="list-style-type: none"> • All emergency admissions • Emergency admissions for UTI • Individuals with at least one emergency admission in a year • Individuals with more than three emergency admissions in a year
Poole	<ul style="list-style-type: none"> • All emergency admissions • Emergency admissions for UTI • Individuals with at least one emergency admission in a year • Individuals with more than three emergency admissions in a year • Emergency bed days
Leicester	<ul style="list-style-type: none"> • All emergency admissions • Emergency admissions for UTI • Individuals with at least one emergency admission in a year

Camden

Compared with England as a whole, the London Borough of Camden has a relatively young population, with a lower proportion of older residents. From around 2005, emergency admissions in over 75s have been deviating from expected values (Figure 3). Similar patterns have also been observed for admissions for FNOF (see Figure 4), and COPD.

Figure 3: Trends in the observed and expected emergency admissions for those aged 75 years and over in Camden, 2005/06 to 2013/14

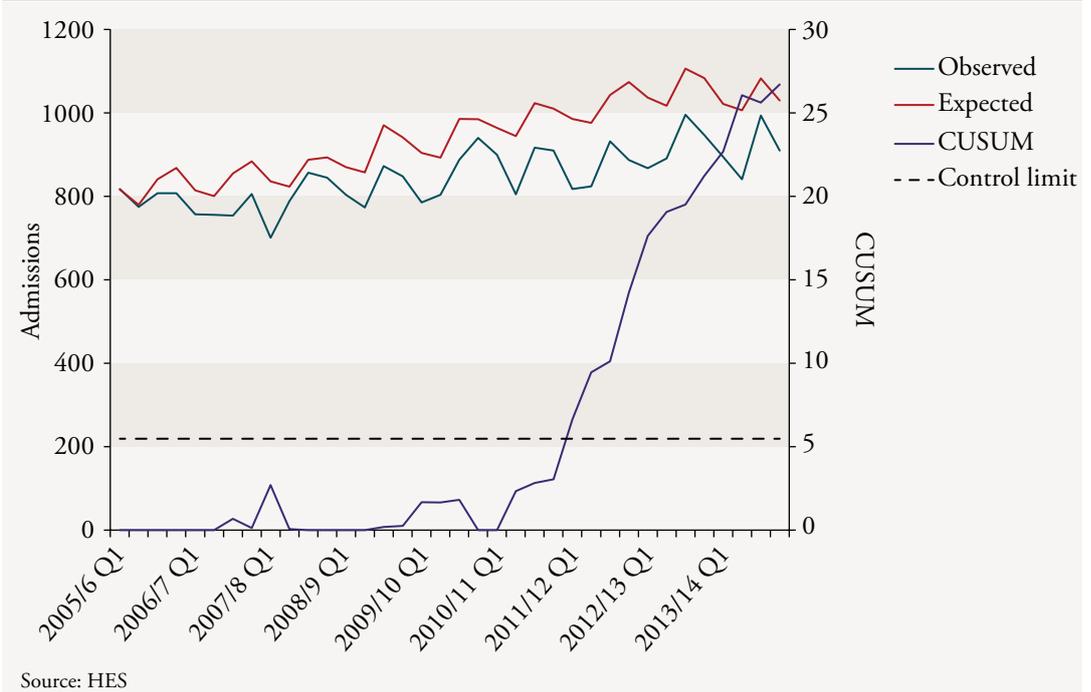
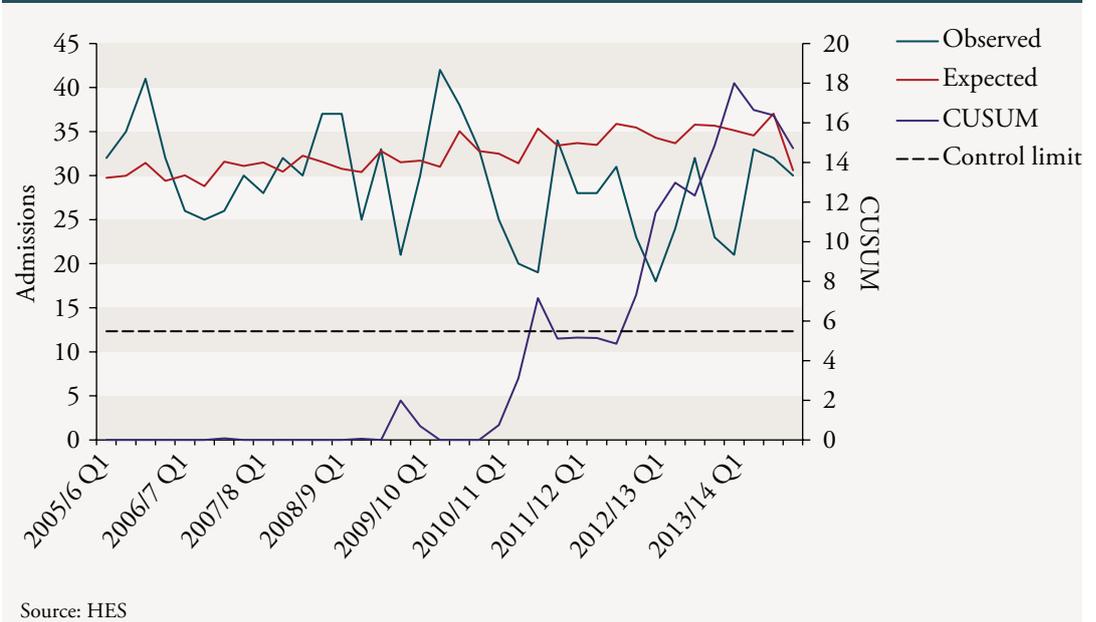


Figure 4: Trends in the observed and expected emergency admissions for fractured neck of femur among those aged 75 years and over in Camden, 2005/06 to 2013/14



We spoke to people representing a range of professions from across the health and care system (for example the CCG, the local acute trusts and the local authority public health team) to inform us about specific initiatives that may underpin our findings.

From these discussions, it was clear that there had been a sustained effort to improve the health of frail older adults. However, it has not been possible to pick out

one particular intervention that can be attributed to the reduction in emergency admissions. Initiatives focused on trying to achieve this have been implemented during our timeframe of interest (since 2005) but it is unclear (without further investigation) whether they had begun early enough to verify some of our findings.

The individuals we interviewed were not able to describe many initiatives prior to 2010 that could account for the overall trend, except for an upstream service called WISH+ and the falls prevention service. (WISH+ is a referral hub through which local residents acquires access to prevention services that encourage warmth, income, safety and health services.) Other initiatives include locally enhanced services around support to residents in care homes and intermediate care/rehabilitation facilities.

Other than these initiatives, sources commented on the high level of clinical engagement from both hospitals and GPs, an openness to innovative practice and the good working relationships between social and community care. The area has a long history of joint commissioning between the CCG (previously the primary care trust) and adult social care, of being comparatively well funded and of applying a population health perspective. We were also told about strong, sustained leadership with a small core group that has championed the care of the frail and older people and the use of data to inform practice. Camden's success at maintaining better-than-expected emergency admissions may be more attributable to these cultural factors rather than one or two specific initiatives.

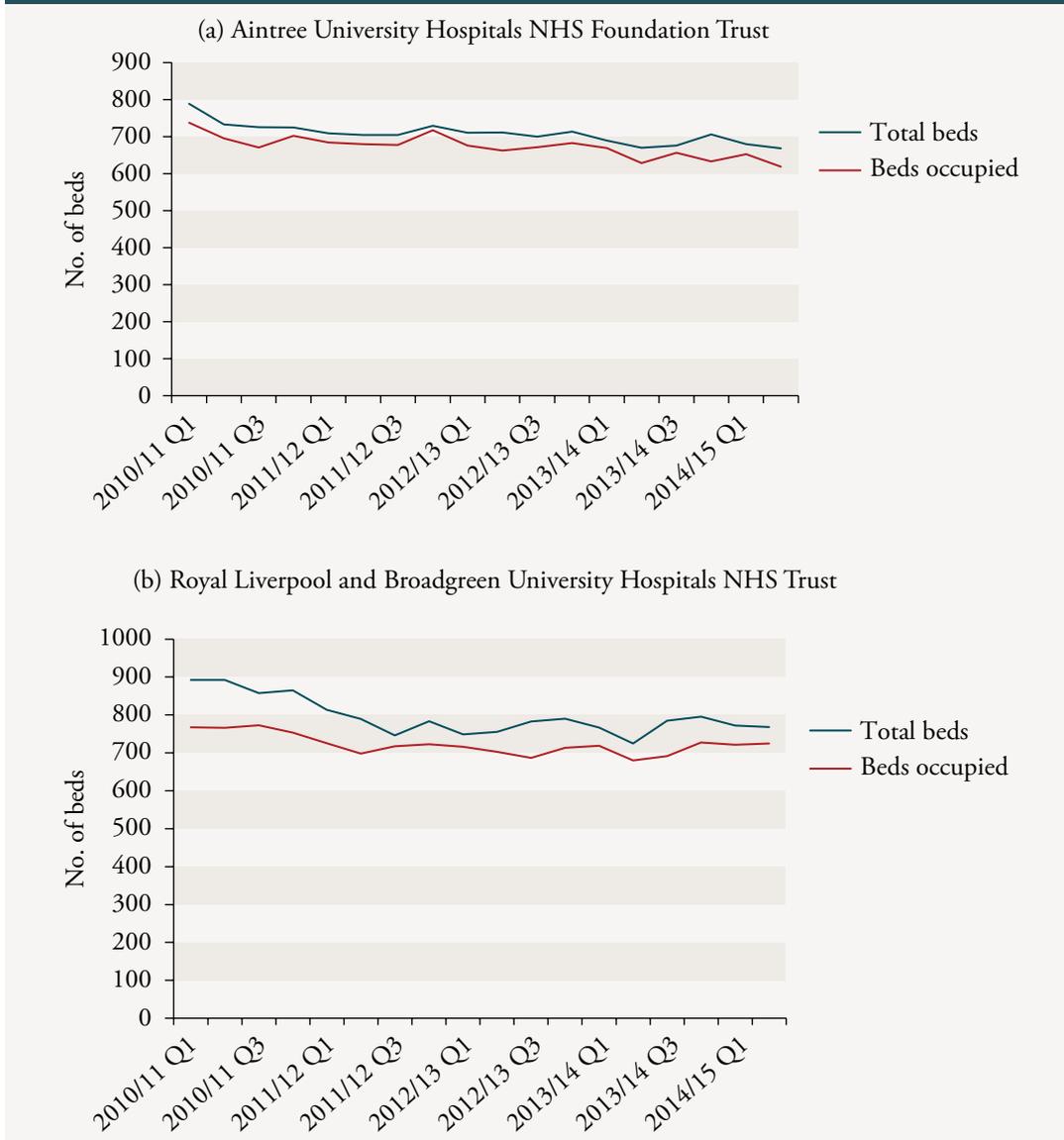
Although Camden has seen changes in admission rates for FNOF that have been significantly better than observed nationally, according to the Public Health Outcomes Framework the rate of falls among people aged 80 or over is higher than for England as a whole (Public Health England, 2014). (In 2012/13 the respective figures were 5,357 per 100,000 in Camden compared with 5,015 per 100,000 in England). This suggests that the lower admission rate for FNOF may not be related to a general population falls prevention strategy, but possibly a more targeted secondary prevention service to reduce falls in people who have fallen once and to strengthen osteoporotic bones. Evidence of this comes from a proactive outreach programme in care homes with frequent fallers that started in 2010 and the screening of patients aged 80+ years at one of the local hospitals by both a geriatrician and occupational therapist.

Liverpool

Rates of emergency admissions in Liverpool have historically been among the highest in the country, but since 2005 they have remained constant in comparison with a national upward trend (Figure 2). The result of this is that, by 2013, standardised rates were very similar to national values. A similar pattern has been observed with older patients diagnosed with COPD, while rates of patients with UTI have moved from being close to average to much better than expected.

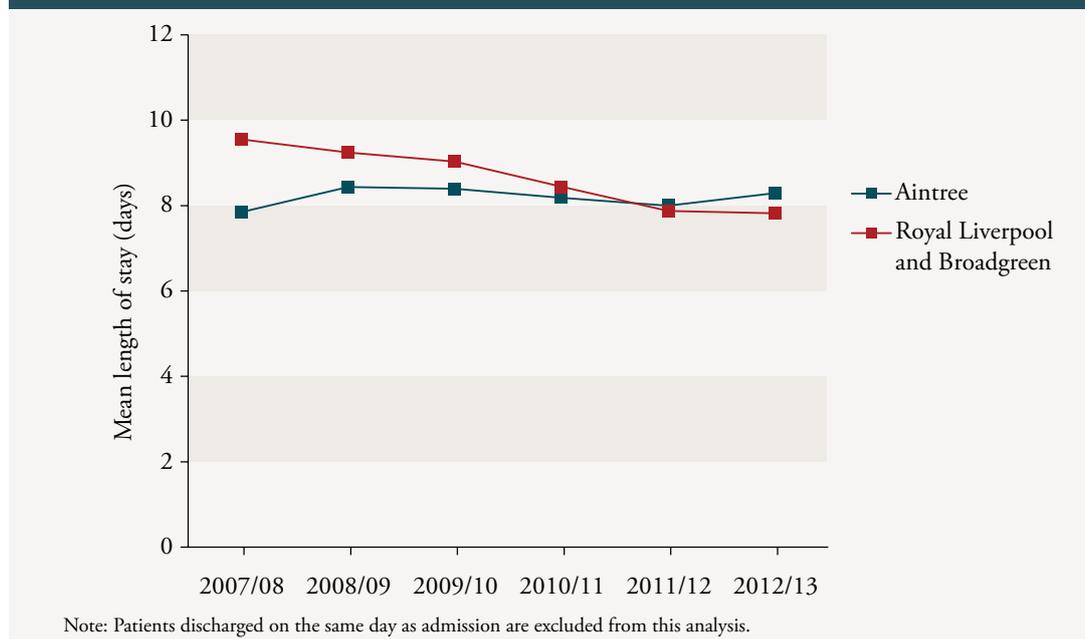
Liverpool was of particular interest in that similar trends in admission rates were observed in a number of the surrounding boroughs.

Figure 5: Total beds and beds occupied at the two non-specialist acute providers in Liverpool



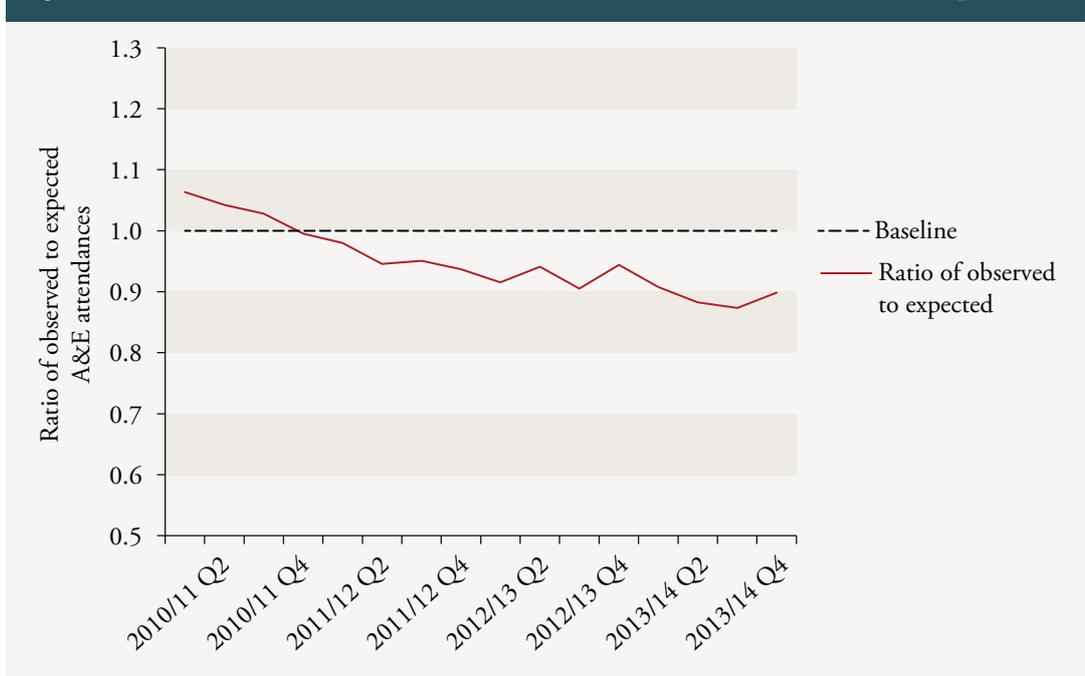
Most of the residents of Liverpool are served by one of two major acute trusts, Aintree University Hospitals and Royal Liverpool and Broadgreen University Hospitals. The changes in admission rates have coincided with a loss of beds in both of these acute trusts (Figure 5). To some extent, the loss of beds at Royal Liverpool may have been absorbed by shorter lengths of stay, but at Aintree lengths of stay have remained roughly the same (Figure 6).

Figure 6: Average lengths of stay for non-elective admissions to the two non-specialist acute providers in Liverpool (all ages)



As with emergency admissions, numbers of A&E attendances for older Liverpool residents have not increased in line with England as a whole (Figure 7).

Figure 7: Trends in standardised A&E attendance rates for residents of Liverpool



The hospital clinicians and public health officials we spoke to were unable to identify any specific initiatives that could explain these findings over and above what other areas were doing. Neither could we find anything relevant from a review of Liverpool's health and social care strategic papers. However, they could confirm the trends in emergency admissions and A&E attendance. The 2007 strategy for health recognised

older people as high users of services and called for whole-system thinking to address this, but the people we spoke to were unable to find any specific community initiatives that could account for the reduction in admissions (Liverpool Primary Care Trust, 2007). The 2014 strategic plan (Liverpool Clinical Commissioning Group, 2014) resulted in the setting up of frailty units in the hospital to support older people who do not require admission to hospital, but the improved trends that we identified started earlier. Our contacts were particularly surprised about the improvement in COPD emergency admissions given the high rates of smoking locally. Considering that there had been a rise in admissions for other respiratory conditions such as pneumonia, one person we spoke to wondered whether the decreasing COPD admissions could be a false positive caused by changes in clinical coding practice.

It may be that there have been no new or innovative approaches in Liverpool that would stand out, but that standard interventions have been successfully nuanced to fit this community. Upstream community interventions could also be occurring in primary care or in the community outside the traditional remit of health and, hence, have not been recognised as significant but are helping to keep people out of hospital. For example, a Local Investment Finance Trust (LIFT) programme aiming to make local health services more accessible and effective was active in Liverpool around the time admissions were falling (Amion Consulting, 2013). One further consideration is that since admission rates have started from a high level, it may be easier to achieve success in reducing them than in areas where there is less room for improvement.

Northumberland

Northumberland is served by a large foundation trust, Northumbria Healthcare NHS Foundation Trust, with multiple acute and community sites. The foundation trust took over responsibility for community services and adult social care services for Northumberland in 2011.

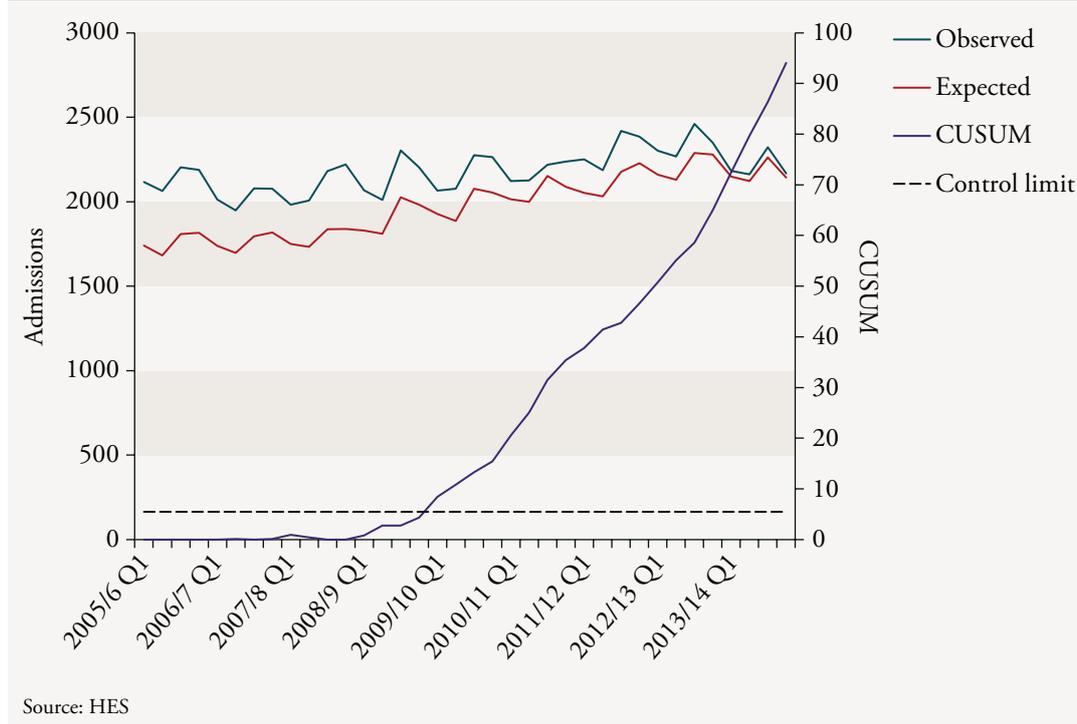
Our analysis indicates that Northumberland has been successful in maintaining a more stable trend in emergency hospital admissions for older people than would be expected had they followed the national trend (Figure 8). To try to identify the specific initiatives that underpin these findings, we also undertook qualitative analysis of several organisational publications and held interviews with health professionals at the foundation trust. The interviews suggested that the reduction in emergency admissions may have been the result of organisational changes from 2004 onwards that involved senior clinicians reviewing patients in A&E earlier in their care pathway, and led to decisions about management that meant an admission could be avoided.

The patterns of activity observed for Northumberland residents over 75 years still show a stable attendance of patients in out-of-hours A&E. Efforts to offer alternatives to presentation at A&E and interventions to support vulnerable patients in the community and prevent readmission have only been implemented in the last three-to-four years.

The information gathered through qualitative analysis provides some evidence to explain the findings. However, more detailed information and analysis would probably be required to determine why some initiatives have been more successful than others as well as a validation process for assurance that the findings are not false positives.

It should also be noted that our analysis was carried out using data that predated the opening of the trust's new emergency care hospital, which itself could have an influence on future trends.

Figure 8: Trends in the observed and expected emergency admissions for those aged 75 years and over in Northumberland, 2005/06 to 2013/14



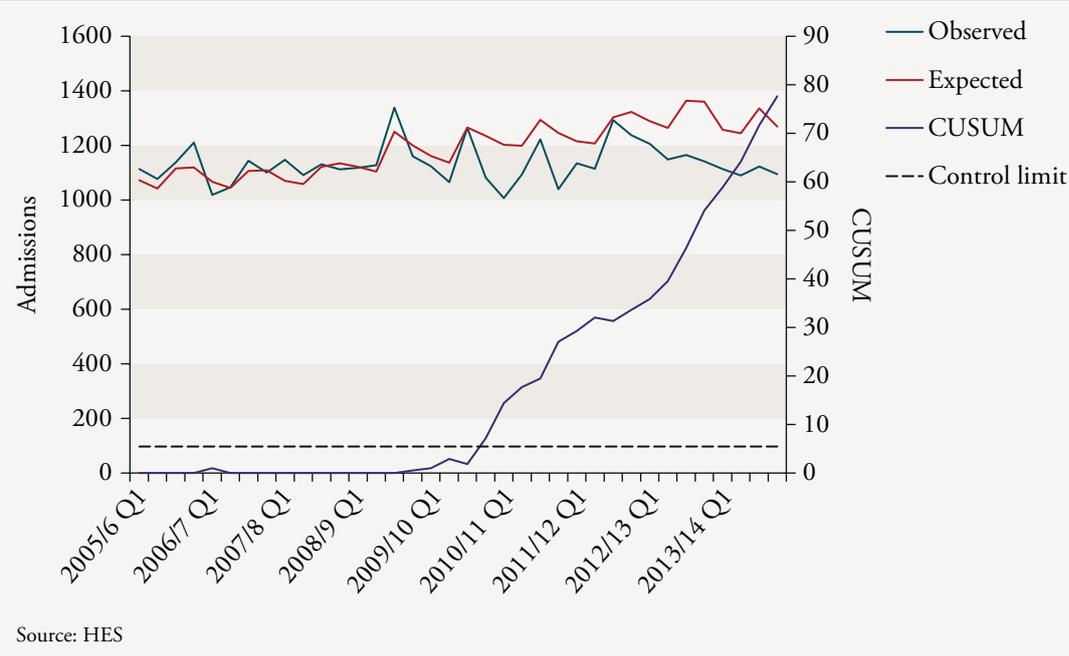
Discussions with a clinical director from Northumbria Healthcare NHS Foundation Trust suggested that the decrease in admissions into hospital from A&E was due to several changes made since 2004. These included senior physicians working longer hours in A&E, reviewing patients earlier in the care pathway and taking decisions to discharge patients earlier, giving them appointments in ambulatory care or outpatients. They also assigned more junior doctors to A&E in order to clerk patients more promptly. In addition, in acute medicine, the hospital employed more permanent positions and stopped using locum consultants. They increased the hours a senior acute medicine physician was also on the 'shop floor' to 14 hours a day Monday to Friday, and in 2012 they made this available seven days a week. Other initiatives set up by the trust to efficiently manage older patients, like the older person's assessment unit (part of the frail older people pathway) and ambulatory care were not set up until April 2012, which is after the changes observed in the data. According to a clinical director at the trust these have not had as notable an impact on admissions as senior decision-making earlier in the pathway.

The interviews confirmed a view we had gained from our soft intelligence that critical success has been achieved through consistent stable leadership, close working across the health and social care system, with community and social care services under one trust, and clear organisation and governance structures.

Poole

Since 2005, emergency admissions among Poole residents aged 75 years and older have remained constant against an increasing national trend (Figure 9). From 2008/09 onwards, the total number of bed days has decreased as a result of both a 20 per cent reduction in length of stay (from 2007/08 to 2012/13) and a 22 per cent reduction in

Figure 9: Trends in the observed and expected emergency admissions for those aged 75+ years in Poole, 2005/06 to 2013/14



general/acute bed supply (from quarter 1 2010/11 to quarter 2 2013/14). The reduction in bed supply led to increased bed occupancy from 80 per cent to 85 per cent.

Over this period there have been a number of initiatives, both in the community and acute care, that may have contributed to these changes in activity levels. Since 2008/09, Poole Hospital NHS Foundation Trust has made significant progress in reducing length of stay, and managed to remove beds from the local hospital. Among the older population, the maintaining of a constant emergency admission rate against a national increase suggests that there may be an emphasis towards treating older adults out of hospital.

In 2008, there were developments in intermediate care and community services. The Poole intermediate care service (PICS) was a team that focused on helping patients regain independent living skills and ensuring the necessary services were in place for patients to remain living in their own home. The service hoped to prevent unnecessary admissions and enable rapid discharge.

However, one key informant believed that PICS had more impact on improving discharge than preventing admissions and may have had a positive impact on length of stay – whereas interventions by social care through their re-ablement programme and supported housing may have contributed more to assisting people to stay well in their own homes.

From 2008/09, Poole, with Dorset and Bournemouth was also part of the ‘Total Place’ pilot, which brought together statutory bodies with the aim of reducing public expenditure. They were to achieve this through reducing dependency on secondary health care and intensive social care and increasing investment in community services and preventative activity. Key informants described it as a joint health and social care initiative that brought together seven different organisations in a partnership and that took a whole-system approach. However, although participation in the pilot demonstrates a long history of collaborative working, they did not believe that Total

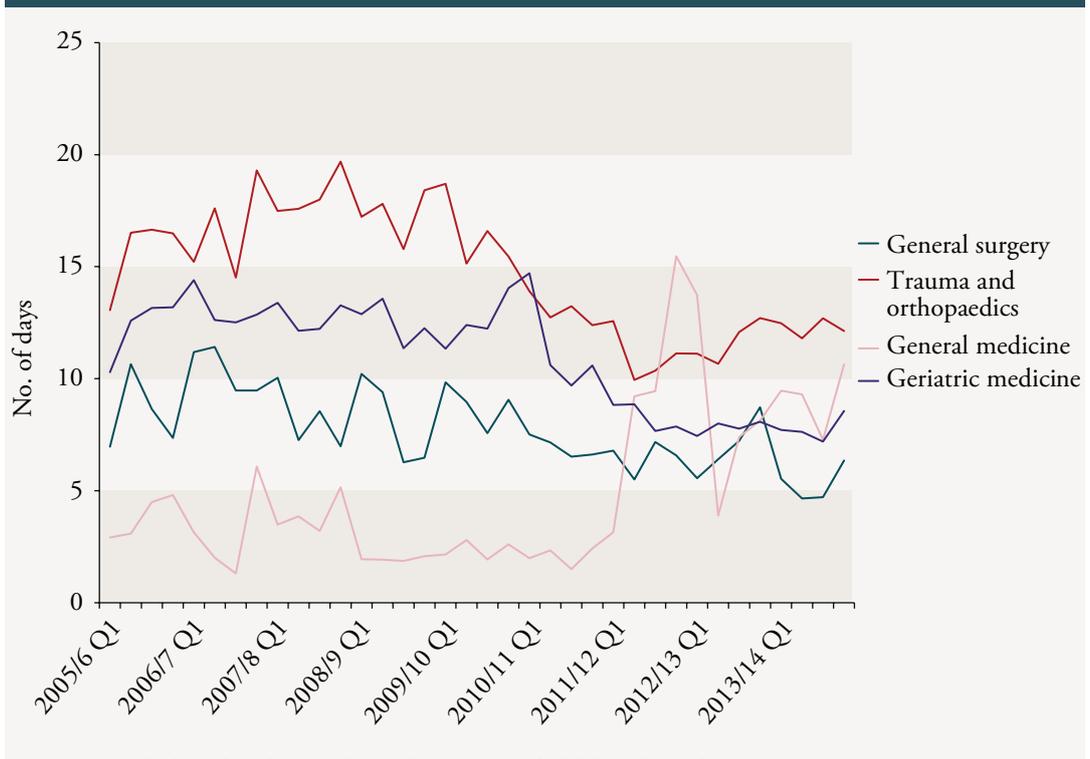
Place delivered as much as was expected and felt that the upstream interventions probably could not directly account for change in observed emergency admissions.

The A&E attendance rate for patients aged 75 or more years in Poole is approximately 20 per cent lower than expected for the case mix. However, the proportion of A&E attendances resulting in an admission for patients aged 75 or over rose from 48.6 per cent in 2010/11 to 55 per cent in 2013/14. This may suggest success with the provision of community services that are lowering attendance at A&E for minor complaints, meaning, as a result, that a greater proportion will have more complex issues necessitating admission as an inpatient.

Since July 2010, the acute provider in the area has also separated out the medical take of older people in the hospital and opened a rapid access consultant service (RACE) unit that focuses on a dynamic and proactive approach to comprehensive geriatric assessment. This dedicated geriatric ward of 26 beds sees approximately 450 patients per month, with a focus on timely resolution and discharge. The RACE unit also diverts patients from emergency admissions by allowing GPs and community care professionals direct access to a consultant on the telephone (Monday to Friday 8.30am to 5.30pm). A key informant mentioned that the majority of their patients were aged 80 or over and we can see marked declines in length of stay for that age group, particularly within geriatric medicine (Figure 10). The proportion aged 80 or over discharged within two days following an emergency admission has increased from just under 30 per cent to around 40 per cent since 2010, although the number readmitted within seven days has remained stable.

In addition to initiatives, key informants from the acute provider described strong leadership and collaboration with adult social care teams, who worked with them to address issues such as patient flow in hospitals.

Figure 10: Average lengths of stay for non-elective admissions to Poole hospitals (ages 80+) by main specialty at admission

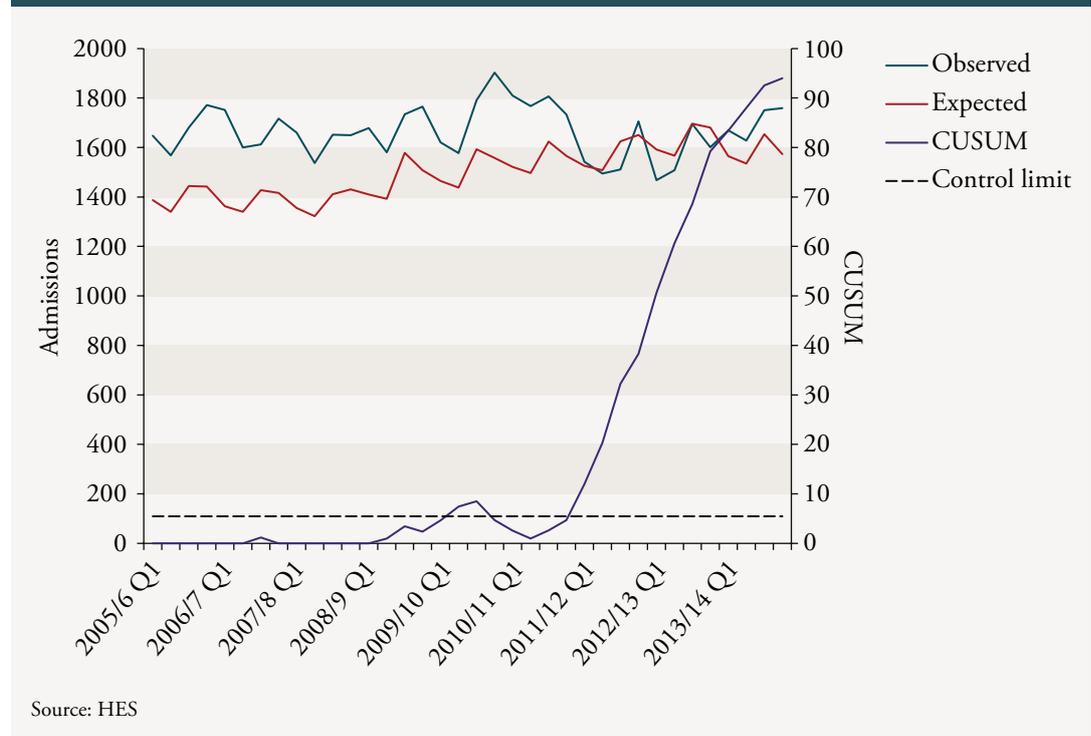


Note: Patients discharged on the same day as admission are excluded from this analysis.

Leicester

In Leicester, the total observed emergency admission rate is higher than would be expected, but since at least mid-2011 it has not risen in line with national rates and, by 2014, it was approximately the same as expected (Figure 11).

Figure 11: Trends in the observed and expected emergency admissions for those aged 75 years and over in Leicester, 2005/06 to 2013/14



From discussions with local health professionals and a review of key strategic documents, we learned that Leicester applied ‘a whole-system perspective’ to reducing admissions in frail older people. The resulting interventions were part of a joint strategic paper put together by physicians from the acute provider, public health and social care. In 2011, the local acute provider opened an emergency frailty unit (EFU), which is a geriatrician-led rapid assessment unit for frail older people who arrive at hospital. It was set up to be a single point of access, coordinating the best available care for the individual both inside and outside the hospital. The EFU brought together the acute medical services for the Leicester Royal Infirmary and Leicester General Hospital onto one site. Before 2011, older patients were seen in an emergency decisions unit, not specific to older patients, but employing a comprehensive geriatric medical assessment (CGA). The CGA is a multidisciplinary assessment that involves clinicians, therapists and social care. Health professionals in Leicester have evaluated their interventions for older people and published them in peer-reviewed journals (Conroy and others, 2014; Edmans and others, 2013a; 2013b). These evaluations recommend that the ‘Identification of Seniors at Risk score’ (ISAR) tool and the CGA alone do not significantly impact outcomes. However, introduction of the EFU, which used both the CGA and the ISAR tool, reduced the proportion of older people coming to A&E who were subsequently admitted. The published evaluations also demonstrate a local area’s commitment to implementing evidence-based interventions for improving outcomes.

In addition to introducing multidisciplinary assessments of older patients in medical crisis on the EFU and senior clinician/geriatrician involvement in the clinical decisions for older patients early in the pathway, Leicester also restructured and increased geriatrician input into community hospitals. Through the Better Care Fund they have expanded this community health offer and are able to meet the needs of patients requiring unscheduled care without bringing them to hospital. Although no formal evaluation of this intervention has been found, this may be one of the means that Leicester is using to keep attendance at the emergency department down. One person we spoke to reported that success was due to the 'can-do' culture propagated by management and the fact that Leicester is a relatively small area working with one acute trust and one community trust.

Interestingly, Leicester struggled to keep the EFU open, even with a positive evaluation, and it closed temporarily between March and July 2013. This may be reflected by the slight divergence between observed and expected outcomes at roughly the same time (Figure 11). Our local contacts told us that before implementing a solution like the EFU, areas need the necessary infrastructure to support the response and to have clearly thought out how it will work.

Emerging themes

When sharing information with individuals within the five areas we were always aware of the possibility that none of it would be new to them and that similar data may have already been used to monitor progress with respect to specific initiatives. However, we found that not all areas were aware of the local trends they presented. It was also difficult for them to attribute the results to specific local initiatives in older populations. Where they were able to identify activities that could have been having an effect on hospital indicators, they tended to be interventions within acute provider settings. However, this could be a reflection of the people we spoke to. Interviews tended to be with individuals linked to the NHS and therefore they described medically focused interventions. Any social care interventions that were being undertaken may have been missed.

Across the five areas, there were a number of common themes that arose from the interviews with local leaders who may each have either an individual or combined role in improving the quality of care of older people.

Senior clinical decision-making

Successful acute provider initiatives often involved senior decision-making earlier in the patient pathway, as described in Northumberland and Leicester. There has also been a recent move in most areas for acute providers to open assessment units, specifically for older people. This not only enables senior decision-making early in the patient pathway, but focuses on providing multi-disciplinary assessments of emergency referrals in older patients. Many of these assessment units have not been established long enough to measure their impact, although our local contacts believed that they were important and were having an effect. Leicester was the only area to have robustly evaluated its unit and assessment methodology, and it found significant benefits.

Collaborative working

A second theme described by the key informants was collaborative and joint working across sectors. Although the resulting initiatives could not always explain the data, this was considered to be an important factor and often described as a reason for success. Camden said they had a long history of joint commissioning. In Northumberland, acute care, community services and adult social care were all part of the same trust. Poole piloted 'Total Place', which predated initiatives like the Better Care Fund, and in Leicester they described how having only one acute trust and community provider made collaboration simpler.

Leadership

All of the areas described stable leadership and creating champions for the care of frail older people as being highly important. Camden commented on enabling continuity in leadership through times of transition and our contacts all identified particular individuals who ensured that care of older people remained a priority. Northumberland and Leicester described changes to the structure of the acute medical services that

would have required strong senior management and stewardship. A key contact in Poole described the leadership in adult social care as “visionary” and this facilitated collaboration between health and social care.

Other themes

Other themes that came out of the qualitative interviews were strong clinical engagement and a will to change or try innovative ways of working. Interviewees also talked about making “data intelligent” decisions and one area talked about being comparatively well funded, which was an important factor in them being able to be innovative. Although strategic papers for the areas often described the use of a ‘whole system or population perspective’, there is no evidence that having this view necessarily resulted in effective actions.

Gathering local information

Our ability to analyse local circumstances was limited by the lack of information we were able to collect. We struggled to contact all relevant local professionals and collect their input. While individuals could be identified by name and occupation, there was either a lack of response to requests or a lack of meaningful contact information to establish useful channels on communication (i.e. only an email address or switchboard number).

The reasons for the lack of responses were not determined, but we could speculate that this engagement would be seen as peripheral to an increasingly burdened workforce (and therefore very low down on the priority list locally), and/or people did not feel ‘qualified’ to discuss the findings either from a technical point of view, a content knowledge standpoint, or both.

Organisational memory

Organisational memory was among the difficulties noted in gaining an understanding of what was going on in one area. The impression we gained was that there had been a high turnover in personnel over recent years, perhaps partly driven by national changes in health and social care systems, meaning that individuals that were spoken to were not necessarily aware of what went on before them.

Perceptions of ‘innovation’

Alternatively, the ways in which innovations are started and the terminology used to describe them may have influenced individuals’ understanding of what was important. For example, there may have been effective local changes to the delivery of care that were not part of a formal process or strategy, or that may have been given a name that did not make it seem like a new change.

Local use of data

The ways that different organisations look at outcomes data can be improved. Using time series to identify evidence of local improvements was familiar in some places, but not uniformly. Some organisations were still reliant on benchmarking themselves against others and attempting to explain variation as being due to lack of risk adjustment – in the case of deprivation, for example. A greater emphasis on benchmarking against local historic outcomes would overcome many of these problems.

Discussion

The aim of this work programme was to investigate how we can use data to identify patterns of outcomes that may reflect improved quality of care for older people, and to understand whether any local initiatives could be causing this.

We applied novel statistical methods to routine health data to identify geographical areas in England that showed signs of improvements in the quality of care for older people. We then proactively followed up some of these areas to try to gain a better understanding of care improvement initiatives that may account for the change.

Methodology

This pilot study was useful in helping us to understand how, and whether, data outliers can be used to identify local populations showing improvements in care quality. By combining this statistical method with proactive interviews with local health and care providers and commissioners, we sought to understand specific projects that might be driving the change. Such an approach did not seek to be efficient at detecting all successful local activity, but rather to establish indicators that have a reasonable chance of identifying where there is some success. In other words, we were looking for high specificity rather than high sensitivity.

There were advantages to using data as a ‘way in’ and then, through dialogue, establishing sets of indicators that better reflected the activity being carried out. This has the potential in future to result in an iterative process of indicator refinement, potentially generating new indicators that may better identify areas of care quality improvement.

However, it would be premature to assume that the success of an activity in one place guarantees the success of a similar activity undertaken elsewhere. Much may depend on the people involved and particular local factors that are hard to replicate.

We analysed data by local authority, which meant we were only likely to pick up activity that had an influence at that level. It would also be possible to use HES to focus at a lower level, such as individual GP practices, or small groups of practices, who may be involved in more localised activity.

Conversely, there were some indications of influences working at a higher level than local authority area because several areas that signalled for improvements in admission rates were geographically adjacent. There were particular clusters around Merseyside, the North East and the area surrounding Bristol. In fact, a population overview approach to quality that does not focus on specific indicators may be increasingly relevant given the development of accountable care organisations (ACOs) and a population-based approach to commissioning.

There were several individual conditions we could have focused on that reflect different aspects of care of older people. For this pilot we chose COPD, FNOF and UTI. But when engaging with the local areas, many stated that they thought that the diagnosing

and coding of UTI was not uniform, either between organisations or over time within the same organisation, which raised concerns about this diagnosis generating too many false positives.

The use of time series was valuable because it allowed us to compare local outcomes against their past history and to compare subsequent trends against the national trend. In the context of measuring improvement this was more useful than, say, comparing outcomes at one point in time using a funnel plot. It also navigated the problems of achieving an adequate risk adjustment, provided local risks remained roughly the same over the period of analysis. Moreover, time series can help identify when changes are likely to have happened and whether important changes have been sustained, which was useful for understanding whether the local initiative we were being told about could be thought of as a likely cause of what we were seeing in the data. In Camden, for example, some of the activity they described only started after the changes we saw in the data, which raised questions about their influence.

Another valuable use of time series is that if useful indicators can be established for identifying success, these can be monitored prospectively. In this way local teams can identify quickly whether a new initiative is achieving what they want it to achieve.

Areas for further research

There are perhaps two distinct areas for further research. One relates to indicators and another to our findings from engaging with local areas. With the latter, further research could focus on a wider national review of the themes and initiatives we identified, such as the effectiveness of early senior clinical assessment of older people or the value of good and relevant information.

At this stage, the more important areas for further research probably relate to indicators. In this pilot we only used a few measures relating to A&E and emergency admissions, but with better use of linked data it could be possible to look at longer-term outcomes relating to patient resource use or event-free survival.

Rather than focusing on different indicators in isolation, there may be scope for developing ways of assessing combinations of indicators, so, for example, triggers may come from certain conditions being satisfied across two or more measures.

It would be useful if we could validate any indicators that we propose. There are a number of local cohorts of older people for whom patient experience data are collected and that could be linked to HES, such as the Newcastle 85+ cohort or patient-reported outcome measures (PROMs). These could help us understand the strength of any relationship between indicators we derive from HES and actual patient experience.

The time series techniques we used in this pilot could be refined for use as part of a routine local surveillance tool that areas could use for real-time monitoring. This could be particularly useful for ongoing evaluation of a new initiative.

Conclusion

This study shows that there is scope for using more sophisticated analytical methods for identifying improvements in care quality, and that they have advantages in improving specificity and as continuous monitoring tools. If used for local monitoring, any issues of inadequate risk adjustment are less of a problem. During our engagements with local areas, we had problems attributing cause and effect, but this may partly be a consequence of using retrospective findings and the complexity of care. There are likely to be greater advantages in using these methods for prospective monitoring and evaluation, but only once clarity has been achieved regarding the benefits that a new initiative is expected to show.

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Appendix: Framework for discussions with case study sites

Box A.1: Framework for discussion with case study sites: notes

Site

Date

People spoken to
(and role)

Phoenix team
members

Explanation

We are looking at how best to use national indicators to identify good practice in the care of older people.

As part of that project we are trying to relate the findings from national analyses to local initiatives to improve the quality of care.

Having undertaken some analyses of national indicators around patterns of hospitalisation amongst older people, we wanted to talk with you about any local initiatives or care models that you have in place.

Purpose (if asked to clarify)

- To try and understand our findings, see if we can validate them with local initiatives.
- To identify areas which are making a difference and share the learning.

Outputs (if asked)

Ultimately we will be publishing a report of our findings on the Nuffield Trust website. We would like to highlight areas making an improvement in care of older people which is noticeable at national level.

Table A.1: Discussion prompt system used during interviews with case study sites

	Discussion prompts	Summary of discussion
	How do you think [local authority area] is doing compared to elsewhere in the country in providing good quality care for people over 75 years of age - measured by rates of emergency admissions?	
	[Present our findings for area]	
	What are your initial thoughts on these findings (e.g. are you already aware, surprised of change in some areas and not others?)	
General questions	Do our findings make sense to you? If so, what might lie behind these findings?	
	Do you have any evidence to support your thoughts about what local interventions have been effective?	
	Can you share results of any local evaluations?	
	What are the key factors which you think have helped success of this programme?	
	How transferrable do you think your approach to other areas?	
	Are you doing anything to monitor effectiveness of interventions targeted towards over 75s?	
Site-specific questions		
Summary	Are there any others you think it is worth us speaking to in order to gain further insight? (Names/contact details)	

About the authors

Chris Sherlaw-Johnson joined the Nuffield Trust in January 2014 from the Care Quality Commission (CQC). At the CQC he ran their surveillance programme, which involved the continuous monitoring of quality of care indicators across health and social care in order to identify potentially concerning patterns of outcomes that could then be followed up in an appropriate manner. This was a continuation of the programme he helped to set up within CQC's predecessor, the Healthcare Commission, and which prompted the decision to investigate Mid Staffordshire NHS Foundation Trust in 2008. He also led the statistical analysis that supported the Mid Staffordshire Investigation. His career began in the Department of Trade and Industry, where he developed forecasting models of the civil aviation market in order to advise decisions for funding British aerospace projects. He later joined the Clinical Operational Research Unit at University College London (UCL) where he helped to develop tools that hospitals could use for monitoring outcomes, including the now widely used variable life-adjusted display (VLAD) approach. He is an Honorary Senior Research Fellow with the Department of Mathematics at UCL and a Fellow of the Operational Research Society.

Alisha Davies is Head of Research and Development at Public Health Wales and is a Fellow of the Faculty of Public Health. She was previously a Senior Research Analyst at the Nuffield Trust. She joined the Trust in 2014 and has a particular interest in evaluation of innovative models of health and social care, with a focus on prevention and quality improvement. Prior to joining the Nuffield Trust, Alisha worked in public health roles in a primary care trust, a local authority and an acute trust supporting service redesign and evaluation in practice.

Claire Currie is a Specialty Registrar in Public Health in the East of England Deanery and former Nuffield Trust Public Health Trainee. She has previously held public health training positions at the Knowledge and Intelligence Team (East) at Public Health England (where she worked on a review of prescribing in people with a learning disability), Essex County Council/NHS North East Essex CCG (where she led a review of community hospital beds) and the Essex Health Protection Team at Public Health England. Prior to joining the public health training programme, Claire worked as a pharmacist at NHS Richmond, King's College Hospital NHS Foundation Trust as well as other London trusts. Claire has an MPhil in Public Health from the University of Cambridge (2012) where she was awarded the GlaxoSmithKline prize for the highest achievement. Her thesis studied whether well-being prevents disability in older adults.

Tazeem Bhatia is a Specialty Registrar in Public Health and was previously a GP in Sussex. She joined the Nuffield Trust in January 2015. Her interests are health inequalities and health systems. During her public health career in the UK she has worked at the London School of Hygiene and Tropical Medicine on a Cochrane systematic review looking at the effect of user fees on utilisation and access to health services; at Greenwich Local Authority improving cardiovascular disease outcomes, particularly for women; and at West Kent Primary Care Trust on a health equity audit for HIV. Tazeem is currently working at Guy's and St Thomas's NHS Foundation Trust with the Accountable Clinical Network for Cancer and integrating care for children and young people.

Elizabeth Fisher joined the Nuffield Trust in May 2012 from the Care Quality Commission, where she was an Analyst Team Leader. In this role, she worked on the development and continued production of Quality and Risk Profiles (QRPs) for NHS, independent health care, adult social care and primary medical care organisations, which use information to help target regulatory inspection activity. Prior to that, Liz worked at the Healthcare Commission where she supported the Core Standards Assessment – a major component of the Annual Health Check – for many years. Liz has a PhD in Cell Physiology and Pharmacology, which she obtained from Leicester University. Liz graduated from Manchester University with a first-class degree in Pharmacology, which included a year's work placement at the pharmaceutical company Novartis.

Martin Bardsley joined the Nuffield Trust in September 2008. Martin has over 20 years' experience in health services research and analysis and was formerly Director of Research at the Trust. Over seven years he led the Trust's research team in a series of innovative projects on applied health services research. He is currently working part time as a Senior Fellow supporting a range of projects as well as working as a Senior Fellow at The Health Foundation. He has previously worked in regulation at the Commission for Health Improvement before moving to the Healthcare Commission, where he led their work on new ways to use information to target regulatory activity. This included ground-breaking work on the use of multiple indicators and time series analyses for surveillance. Martin is a Fellow of the Faculty of Public Health and in the 1990s he established a London-wide resource on public health information. This work led to a number of reports on health in London, including the first Public Health Report for Greater London in 1998. Prior to that, Martin had worked on the application of outcome measurement, which formed the basis of his PhD. He was also involved in early stages of the application of Diagnosis Related Groups (DRGs) in the UK – work that eventually led to Healthcare Resource Groups (HRGs) and Payment by Results (PbR).

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