West of England
Academic Health
Science Network

Measuring Demand in General Practice

An exploratory study across the West of England
Academic Health Science Network (AHSN) region

November 2015

Contents

Executive Summary

What is the issue?

Demand for Primary Care services exceeds capacity available. With increasing cost pressures, increase in patient expectation and advances in medicine, more people are visiting their GP than ever before. With no new monies available to significantly increase GP numbers, we are advocating an evidence based approach to measuring and managing demand.

What were our aims?

The aim of the study was threefold:

1. To review existing literature and to scan regional and national projects which aim to measure and manage demand.

2. To understand how GP Practices currently measure and manage demand and how they use routinely collected data to predict demand and strengthen capacity planning.

3. To gain an overview of the three Prime Minister Challenge Fund sites in the region and to determine their approach to measuring and managing demand.

What did we do?

To ascertain what literature exists on measuring demand in primary care we carried out an evidence scan. We also carried out a number of face to face meetings and telephone calls with project leads from national and local projects.

To understand how GP practices currently measure demand, we worked with 14 practices across the West of England Academic Health Science Network (AHSN) geographical boundary to identify what telephone and appointment systems they used, whether they collected data from these systems and how they used that data to help them measure the demand for their service.

We also collected data on levels of demand, how demand is measured and how practice staff manage capacity. In addition, we circulated an online survey for practices to complete asking them specific questions on the type and functionality of their phone and appointment systems. We also had access to the results of a survey from 22 practices administered by the One Care Consortium Prime Minister's Challenge Fund site.

To gain an overview of the objectives of the three Prime Minister's Challenge Fund sites we invited leaders from each of the Prime Minister's Challenge Fund sites to give us their perspectives on primary care. These interviews were entitled *'What next for primary care? Aspirations and priorities'*.

What did we find?

The Evidence scan highlighted a lack of research in this area and a lack of continuity in national projects aimed at supporting GP practices to understand demand. It therefore provided strong evidence supporting the need for a study of this kind and for further investigation of this area.

Work with GP practices revealed no definitive or widespread approach to measuring demand in primary care. However it confirmed that practices and CCGs were struggling to cope with apparently increasing demand and were very keen to engage in further activities that might help understand and manage it better.

It also highlighted possible approaches that could be used to measure demand – via telephone systems and appointment systems. It was clear that telephone systems had the most immediate potential in terms of being collectable and analysable.

While relatively few practices currently have the technological capability to collect and upload incoming call data, a significant minority of practices have the potential to record call volume data. The numbers able to do this could be relatively easily changed through an upgrade or replacement of existing systems.

Appointments are recorded in many different ways and would require a change to a common approach to permit consistent conclusions to be drawn from the data.

However, using a combination of incoming call data and the date that an appointment was arranged (not the date of the appointment) could provide added value.

Analysis from interviews with PM Challenge Fund sites points to a concerted effort to work with practices, the complexities inherent in working with a large number of independent businesses and the challenges of making system wide change happen within a set timeframe.

The limitations of this study are largely around the small sample of practices selected and the limited number of them that were able to provide data from their phone systems.

Recommendations

The findings of the study highlight the need to define easily obtainable proxy measures of demand to better understand how it changes over time at practice, CCG, regional level and to evaluate the impact of interventions aimed at improving patient flow in general practices.

A realistic objective would be for the majority of practices to be regularly uploading, preferably in real-time, measures of demand such as call data, to a database that can show current levels of demand in general practice, while also contributing to a self-learning model capable of predicting demand at time points in the future.

Being able to estimate future demand would allow for workforce planning and also the ability to test the impact of interventions on demand at local, regional or national level.

A possible 'next step' would be to identify and develop a 'minimum dataset' – the minimum amount of data that could be easily recorded from a significant proportion of practices that could contribute to the real time presentation of demand and inform a predictive model.

A significant outcome from this study was a bringing together of individuals, practices, CCGs and Prime Minister Challenge Fund sites, leading to a strong willingness to share learning and to plan further work. It is therefore important to build on this willingness and build a community of practice within the region. With this in mind, an event is being planned for the spring 2016 from which the next phase of this project will emerge.

Context

Current levels of demand for primary care services exceed the capacity available and show no sign of slowing down.

We know this, not necessarily because there are complex data sets available to substantiate the claim, but rather because of the sheer volume of patients being seen, on a planned and unplanned basis, within GP surgeries across the West of England AHSN region every day.

Not only does this apparent discrepancy between demand and capacity create significant knock on effects for patients, it also impacts on the rest of the health and social care system.

There is a significant and growing workforce crisis in primary care, due in part, to general practice and practice nursing becoming less popular career choices. One reason for this drop in popularity, are the perceived pressures experienced by those working in primary care which are intrinsically linked to rising levels of demand.

In response to managing these unprecedented levels of demand, new interventions are being developed, new improvement projects started and new business cases written.

The NHS 5 Year Forward View[1] places an emphasis on large scale transformation as a means of delivering services fit for the needs of our populations.

However, at present, transformations in primary care are based on what we think we know about the number of people needing primary care services, rather than a solid understanding based on facts and the evidence base.

In contrast, organisations such as acute trusts and ambulance trusts who have data driven approach to assessing and managing demand. It is clear that primary care has a significant way to catch up.

[1] https://www.england.nhs.uk/ourwork/futurenhs/

Aims

The West of England AHSN Commissioning Evidence Informed Care programme works with seven Clinical Commissioning Groups to incorporate evidence and evaluation into the commissioning process.

We believe it is crucial that any change, and the financial investment that sits alongside that change, should be based on an accurate assessment of both current and future demand for services.

In direct response to our members' wishes, the West of England AHSN commissioned this exploratory study, which has three key aims as agreed by an expert steering group.

Aim 1: Existing Evidence and Practice

To review existing literature and to scan regional and national projects which aim to measure and manage demand.

Aim 2: Data and Technology

To understand how GP Practices currently measure and manage demand and how they use routinely collected data to predict demand and strengthen capacity planning.

Aim 3: Leadership Perspectives

To gain an overview of the three Prime Minister Challenge Fund sites in the region and to determine their approach to measuring and managing demand.

Exclusions

Our aim was to identify existing measures of demand, as opposed to identifying new solutions for managing demand.

Methods

Evidence scan

An evidence scan was carried out to identify existing research and publications on measurement of demand in primary care in the UK and beyond. *See Appendices 6 for a full copy.*

Selection process for GP practices

The study sample included a total of 14 practices, two from each of the seven Clinical Commissioning Groups (CCGs) within the West of England AHSN footprint. Initial phone calls were placed with primary care leads from each CCG.

Practices were identified through primary care leads and from existing relationships within the West of England AHSN. A study flyer was circulated asking practices to contact us with expressions of interest. Practices were asked to confirm if they could provide retrospective data from both their telephone and appointment systems. Participation included a visit, interviews and data collection.

We received a good amount of interest from GP practices to take part in the study. Practices were chosen on their ability to spare the time to take part and the belief that they could submit the necessary data. The study achieved a 100% response rate from each practice contacted and all 14 practices submitted data.

At the time of interview, participating practices had a registered list size ranging from 4,442 to 18,500 patients. The combined list size of all practices that participated in the study totalled 152,000 patients.

Whilst the primary aim of the study was to determine how practices collect and use data to measure demand,

we felt it important to acknowledge the context in which practices operate, in particular the cost, workforce and patient related pressures they face.
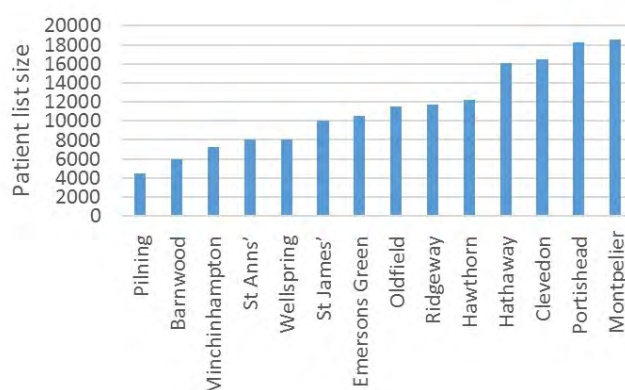

Figure 1. List size of participating practices

Practice Visits

Acknowledging that practices were under a great deal of pressure, we specifically designed our contact with them to be light touch and designed each visit to last no longer than 1.5 hours. Two sets of interview questions were developed: one for practice managers and one for GPs. These were semi structured interviews, digitally recorded and later transcribed. *See Appendices 2: Interview Template.*

Consent and Payment

Each practice signed a consent form agreeing to submit data and authorising the West of England AHSN to use excerpts from their interviews. See *Appendices 3. Consent Form.* Practices were offered a payment of £200 to cover any additional costs relating to data collection.

Leadership Interviews

Leaders from each of the Prime Minister Challenge Fund Sites to take part in a semi-structured interview based on set questions. All leaders accepted. *See Appendices 4: Interview Template.*

Regional Survey

We circulated a short survey to all practices within the West of England AHSN region via our networks.

The survey asked practices to give information on the telephone and appointments system in use. *See Appendices 5: Survey Template.*

West of England Academic
Health Science Network Map

A   South Gloucestershire
B   Bristol
C   North Somerset
D   Bath and North
        East Somerset
E   Gloucestershire
F   Swindon
G   Wiltshire
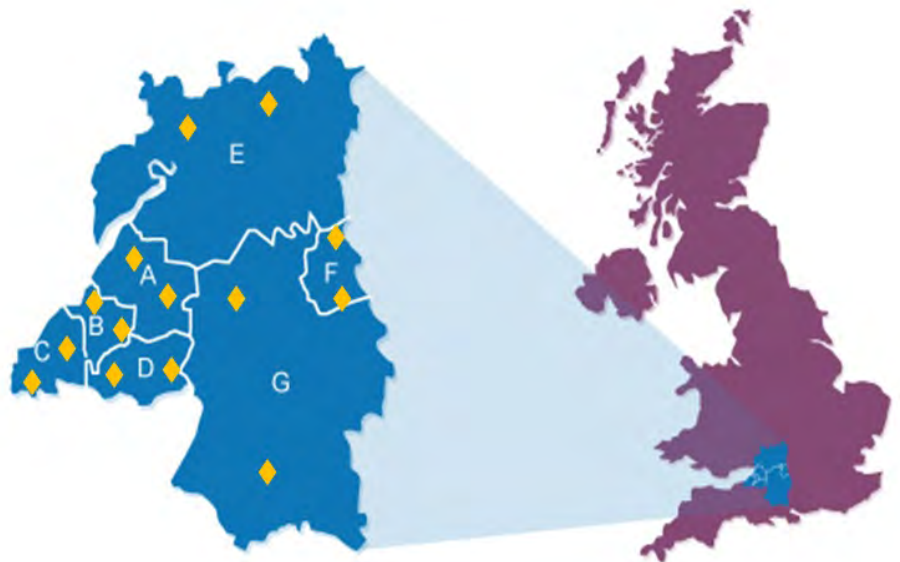
◆   Participating GP practices

Evidence scan

An evidence scan was carried out to determine existing sources of research and publications on measurement of demand in primary care in the UK.

Methodology

The Evidence scan was carried out using the PICO method as outlined below:

Participants: GP practices in the UK (NHS)
Intervention: measurement of demand for services/ patient flows (peaks and troughs)
Comparator: no measurement of demand
Outcomes: primary: management of demand/patient flows.

Evidence available and summary of findings

The evidence scan found:

- No guidelines, systematic reviews or randomised controlled trials on this topic.

- One comparative study which included a comparison of a demand measure (appointments) between two sets of GP practices.

- One narrative review by Benett[2] which identified several methodologies for GP practice access improvement all of which included components dealing with demand measurement.

- In the methodologies identified in the Benett review[2] we found guidance material and work-books for demand measurement.

- In the methodologies identified in the Bennett review[2] we also found a number of case studies from GP practices with some details of how they had measured their demand.

- It should be noted we found no detailed analysis, comparisons or follow-up of most of these initiatives apart from some literature on the 'Advanced Access' initiative. As this was not an exhaustive search it is possible some further literature may exist.

- We found a great deal of literature on the related topic of demand management including supplier-led demand[3] but we have not selected this, except where we could identify coverage of the topic of demand measurement.

In the results of a comparative postal survey[1] slightly more practices involved in the Advanced Access initiative (see below under methodologies) were collecting data on demand for appointments than those who were not taking part in the initiative (85% v 71%) but the overall figure for data collection amongst all responders was high.

The importance of selecting a suitable method for data capture as a first step to demand management is emphasised by Benett[2] and recurs as a theme in the methodologies he identifies. He recommends two of the approaches; one is a DIY approach, the 'how-to guide'[4] and the other a consultancy offer, the General Practice Improvement programme (GPIP)[5].

Case studies offer evidence of at least initial success of some of the measurement strategies introduced but we could not identify any very long term follow up

that might indicate lasting effects.

Case studies were identified for most of the methodologies outlined below and most include an element of detailed data capture as an important first element of an improvement initiative.

Details of methodologies and toolkits identified

The following methodologies are summarised and appraised by Bennett[2]. He does not claim that this is an exhaustive list. They are listed here as listed in the review.

Primary Care Foundation: this organisation offers a consultancy service and toolkit. There is a sample report available from the website[6,7] which includes analysis of demand (for example logging phone calls, analyses of what patients came in for over a period). There is a list of clients which include NHS Bath and NE Somerset and South Gloucestershire but no case studies.

Advanced Access: a methodology from the USA which was introduced to the UK in the early noughties but was not universally well re-ceived. It includes a demand measurement component (tick sheets over a period to enable the practice to understand its demand). We identified a Canadian example of a workbook for this-methodology[8]. Advanced Access was also evaluated by the NHS in 2007[9] but this report does not mention demand measurement specifically. The comparative study identified in the search[1] also relates to this approach and does mention demand measurement.

Treating Access: a toolkit for GP practices to improve their patients' access to primary care[10]. See the RCGP website for detailed information and down-loadable worksheets to measure demand. We have found no case studies so far on this approach.

World Class Commissioning - High Quality Care for all Primary and Community Services - Improving GP Access and Responsiveness[11]: section 2 of this document called Mapping the Baseline mentions measuring demand very briefly in terms only of tracking appointment requests (p22) but does also feature some case studies including one from Tower Hamlets PCT in London (p39 and p60) where demand measurement is a key component. 'Key learnings from the Tower Hamlets experience: rely on data, not intuition. There may be a lot of accepted wisdom about why access is as it is, and why efforts to improve it are futile. This needs to be tested against the facts.'

Improving Access - responding to patients. A 'how-to' guide for GP practices: This guide has been written by GP practice managers and includes a detailed 'do it yourself' guide to data collection in section 1 - 'Do you understand your demand?' There is also a case study from Barnsley, UK.

Telephone Access: this is methodology whose solutions largely seem to involve greater telephone use. It emanates from a consultancy organisation called GP Access with a website (see below) and various case reports from clients.[12, 13] It includes a method of data capture (Navigator) which it claims helps practices to understand and measure their local demand. 'The new way of thinking is demand led – how can we predict the demands of our population and meet them in the most effective and efficient manner?'

Productive General Practice: this is an approach devised by the NHS institute for Innovation and Improvement and currently still being maintained by NHS Improving Quality (NHSIQ). It requires a licence to use. There is useful overview guide[14] and a descriptive document of the 'knowing how we are doing module'[15] that includes looking at current demand. It includes several case studies, some from the West of England, all of which have looked at demand measurement[16-22].

General Practice Improvement Programme: this consultancy service is being run by two organisations, one of which (KM and T) collaborated on the 'Productive Series' and their work appears to build on this[5]. The component relating to demand called 'chasing the tail' appears quite sophisticated and can include detailed profiling of demand segments, eg 'frequent flyers'. There are two case studies featuring this on the website.

In summary, the evidence scan suggested that:

- The level of evidence found on this topic was low.

- No systematic reviews or trials were identified.

- A comparative study, a narrative review, several pieces of methodology literature including guidance notes and workbooks and several case studies were identified which included the topic of demand and flow measurement in General Practice.

- There is little evidence of long term follow-up of initiatives.

The evidence scan highlights the lack of research in the area of measuring primary care demand. Whilst there is a significant amount of research on measuring demand within secondary care, demand within primary care is relatively unexplored. The West of England AHSN study, whilst relatively small scale, provides a good starting point for systematic research in this area.

Local Projects

There are a number of local projects on measuring demand, the majority of which are based in Prime Minister Challenge Fund Sites.

These include work in Bath & North East Somerset to collect and analyse appointment system data, and work in Bristol, North Somerset and South Gloucestershire to collect information on phone systems and the number of urgent care cases in primary care.

In addition, many of the GPs we spoke to referred to the Institute for Improvement 'Productive GP Series', citing that the series had been very helpful but was no longer running.

PM Challenge Fund Leadership Interviews

The West of England AHSN region is home to three Prime Minister Challenge Fund sites. These are based in Bristol, North Somerset and South Gloucester CCG (BNSSG), Swindon CCG and Gloucestershire CCG.

The aim of these national transformation sites is to increase access to primary care services by ensuring that patients are seen as quickly as possible, in the right place by the right clinician.

Leadership Perspectives

We invited leaders from each of the Prime Minister Challenge Fund sites to give us their perspectives on primary care. These interviews, entitled '*What next for primary care? Aspirations and priorities*' provided us with insights on the primary care system, its challenges and success to date.

Leaders were asked their views on how best to engage with practices, how practices could work together to be more efficient and how rising levels of demand could be tackled with few new resources.

A number of themes came out of the interviews, a summary of which is provided below.

Measuring demand

While the belief that a year-on-year increase in demand for primary care services exists and is generally accepted, this is not well evidenced with objective data.

Although there is a robust system in place for acute care commissioning, with detailed contracts as a result, the lack of quantified analysis for demand in primary care leads to simple and crude contract negotiations. The

perceived value and fidelity of primary care services suffer as a result and there is a need to ensure parity between primary and secondary care.

"Primary care is just as valuable as secondary care. We cannot continue to absorb unknown levels of demand and therefore we need to agree on how we use GP resources just as carefully as we use secondary care resources…" [2]

Managing demand is not simply about understanding the numbers but about improving performance.

"…The most efficient practices are absorbing 10-15% demand in a year, then there are others who are not meeting demand and that demand seeps into other parts of the system i.e. urgent care centres and 111…"

Shifting care to the right setting: ensuring patients receive the right care in the right place is not a matter of increasing footfall through a number of new doors but requires supporting General Practice to share resources. New ways of working and creating virtual workforces for smaller practices necessitates trialling new technologies.

It also requires a serious debate with the public about managing self-care and taking ownership of their health and wellbeing.

"Primary care needs concrete evidence of increasing pressure – not just anecdotal information. To address the workforce crisis we need evidence"

Collaboration helps to create a shared vision - essential to providing seamless and integrated care.

[2] All quotes in this section courtesy of Prime Minister Challenge Fund Site leads

Successful collaboration entails ownership and commitment at practice level and change - at pace and scale on a regional level, whilst recognizing that the different sizes of practices present their own set of challenges.

Integration is key to providing high quality services but the challenge is embedding integration across a multitude of small providers each with their own culture, business model and objectives.

Balancing practice level autonomy with solutions that can be achieved at scale is difficult to get right. The dynamic of change, whilst anticipated, is hard to quantify and therefore hard to fully prepare for.

The speed with which change happens, regardless of commitment or the strength of a business case, is powered by people and their journey, as opposed to artificial time lines.

Integrated care requires solid technology platforms which enable cohesive working and that patient records and appointment booking systems are available in a variety of settings.

Defining priorities in a shifting world requires those working in primary care to question how these projects remain sustainable after national funding runs out to allow space for new and emerging priorities to come through. If CCGs are going to make additional financial investments, there will need to be a strong economic case.

Lastly, we asked leaders, 'If you could change one thing about the primary care system first thing tomorrow morning, what would it be'? Here are their responses:

"…Within local health and social care systems, organisations other than primary care recognise their interdependence with the local system. I'd like primary care to replace its culture of independence with one of interdependence…"

"..The biggest challenge is workforce, particularly with an older demography of GPs. Alongside population growth, there is a need for more GPs as many feel that they can't continue. People are voting with their feet and saying, "No, I'm sorry. I'm off."

"There is undoubtedly a workforce crisis. However, we need to ensure that the crisis does not paralyse the system from change. The reality is that we are unlikely to get more GPs, so we need to make the most out of those we do have and that means addressing the work/life balance of many. We need to turn the problem into a conversation about solutions and the way forward..."

Practice Interviews

General Practitioners

A total of 13 GPs were available for interview. We asked them to comment on whether they believed if there had been a significant increase in demand for their services over the past two-three years, how they could evidence this demand and what impact it may have had.

All GPs stated that there had been a significance increase in demand and that they could evidence this through their appointment systems data which showed an increase in the volume of patients they saw compared to three years ago.

"…It used to be that you would see 16 patients in the morning and 16 in the afternoon. Now you see 28 either side, amounting to 56 [in a day]…"

Many GPs believed that the rise in demand had been exasperated by a "perpetually political and media driven mantra" of "if in doubt, see your GP", which caused unnecessary trips to the surgery for ailments such as coughs and colds, many of which could be dealt with by "taking paracetamol and having a rest at home".

''…GPs are expected to meet a need, and they do. Very few patients come to harm from not being able to see their GP…"

In terms of measuring demand, many cited a lack of technical systems to be able to collect data, particularly from their phone systems, and a lack of time and expertise to analyse and action the data that they did have access to.

The impact of increased demand

It was felt that the impact of increased demand was far reaching and damaging to both staff and patients.

Some felt that constant changes in their workforce sometimes on a weekly or even daily basis (and the use of locum GPs in particular) meant that it was hard to set a benchmark for how they were performing against the numbers of patients they were seeing.

"Capacity changes quite considerably, making measurement very difficult…"

Other examples of negative impact included:

Efficiency and productivity was being hampered by high levels of administration, such as "hundreds of emails" and "stacks of paperwork".

"…There is currently a negative outlook within Primary Care. The perception that the situation is unfixable exacerbates the situation. Morale is low, affecting productivity and people's willingness to innovate, but there are no fixes coming in currently, only negative opinions..."

Patients expectations had increased directly attributable to consumer culture "people want it now, they want to be seen first" and that 'too much of the basic work (colds and flu for example) was filling up GPs' time.

"... More of our patients are viewing health care services with a 'consumerist eye' – one that heightens their sense of entitlement as opposed to appreciating that we are a finite resource and have to prioritise those in most need…"

Media and the internet were seen as key drivers of unnecessary demand and had an unhelpful influence on the way in which patients perceived their own health and wellbeing.

"…The Internet is a problem. It often dives you in at the deep end, causing you to fear the worst about minor illnesses…"

There are more patients with complex needs, partly due to an ageing population and age related illness. In addition, advances in diagnosis and treatment options, particularly the range of medications available, meant that more patients needed to be monitored on a weekly or fortnightly basis.

Patients from diverse communities require additional services such as translation, which inevitably increases the consultation time, but also bring with them an expectation based on their 'home culture', in addition to a wide range of complex issues such as immigration, housing and employment.

"…A 10 minute slot is simply not long enough, particularly if I'm meeting a patient for the first time…"

Continuity of care was being sacrificed due to the high turnover of GPs, while patients with complex and multiple illnesses were not always being seen by the same GP, posing risk and management issues.

Contact between primary and secondary care has increased resulting in a greater number of tasks passed from secondary to primary care. There is a growing expectation that primary care will pick up investigations and work that has traditionally been done in secondary care.

''…Secondary Care passes on arranging investigations to GPs without the reasons why, and with the expectation that GPs will have plenty of time to carry out these actions…"

Duplication is an issue with services such as 111 signposting patients back to their GPs.

"…NHS 111 acts a signposting service, not as a clinical advice service, which is a shame…"

In addition, funding cuts to community services had resulted in understaffing and a lack of accessibility for patients to have their social care needs addressed forcing patients to see their GP for help.

Recruitment and retention is made harder because of medical students believing that hospital care is more exciting and the lack of promotion about the opportunities for GPs to combine their work with research and other opportunities.

In addition, many GPs no longer seek to become partner but are happy to work on a locum or sessional basis, allowing them flexibility in their personal lives.

Innovation is being hampered by the fact that:

"Some locum GPs are seen to be 'jetting in and then jetting off' taking with them valuable knowledge of patients and innovative techniques which have yet to be transfused throughout the rest of the practice."

A lack of funds for capital expenditure resulted in outdated facilities and limitations on space preventing practices from being able to deliver their services at scale.

Practice Managers

A total of 13 practice managers were available for interview. First, we asked them, "What is your biggest challenge when measuring and managing demand?"

They identified the following challenges:

- Using and understanding technology and data to predict and manage demand.

- Managing the volume of telephone calls, particularly in peak times such as mornings.

- Recruitment and retention of clinical and nursing staff.

- Replacing routine appointments with urgent slots to meet demand.

- Managing patients' expectations and delivering patient education.

- Balancing the books against a backdrop of increased demand and high locum costs.

- Managing high levels of Did Not Attend appointments.

- Ensuring consultation slots remain within the allocated time.

Data findings and analysis

Overview of data collection

In order to understand what, if any, data was being collected, and how it is used, we asked practice managers:

- What telephone and appointment systems they use?

- Whether they collect and analyse data from these systems and how often?

- Whether the data helps them to plan capacity, eg number of doctors or nurses they need for the week / month ahead?

We also asked practices to submit data from their telephone and appointment systems. In total, 13 practices were able to submit retrospective data from their appointment systems and four practices submitted data from their telephone systems.

Primary care data that were submitted on time for the analysis reported here came from 10 practices: nine practices provided appointments information and four practices provided calls information.

Both call and appointments data came in a variety of formats and covered different time periods. Practices provided either daily, weekly, monthly or annual data.

Practices supplied a variety of data items such as attendances, attendance duration, number of did-not-attend (DNA) appointments, calls answered, calls abandoned, average ring times and average call handling times. Different categorical data was also available starting from GP and non-GP appointments, telephone appointments, slot types, session types, session holder types etc.

However availability of data items and categories varied greatly among different practices.

Monthly time frequency was chosen to summarize and compare data. Daily data was aggregated by month while annual data was divided into 12 months proportionate to the working days available in the specific month (eg Hathaway calls data).

The most common data items such as attendances and DNAs were available for most of the practices.

Some practices provided further details for GP attendances and GP DNA, but for other practices those data items were derived from session holder type like general medical practitioner, sessional GP etc.

Telephone appointments were mostly identified from slot or session types such as telephone consultation, telephone session, telephone triage etc.

In addition to monthly summaries for each practice, more detailed summaries were provided some of the practices: calls by hour for Hathaway surgery and Montpelier health centre, appointments by session holder and slot type for Pilning surgery and Montpelier Health centre, appointments by slot type or Emersons Green and Minchinhampton practices and appointments by session type for Emersons Green.

Telephone systems in use

We found the following telephone systems in use.

Telephone system	# of practices using it
AVAYA	4
MPS	2
BT + Patient Partner	1
RHM	1
Patient Partner	1
LG Nortel	1
Bistech	1
Peach Telecoms	1
Alcatel	1
Mitel	1

Figure 2. Telephone systems

From our discussions with practices on how often they collected and used data from their telephone systems, we identified three levels of data collection:

- A small number of practices collect detailed call data.

- Others need only to upgrade the license on their telephone systems to be able to do so.

- Many more do not collect any data either because existing systems do not have the functionality or because they do not know how to.

Telephone data

In total, four practices submitted retrospective data from their telephone systems in time for inclusion in this analysis. Of the four practices, two submitted data that were appropriate for in-depth analysis.

The pattern of calls during the day is similar between the two practices, with most calls made between 8-9am followed by a gradual decline until early in the afternoon where the number of received calls increases slightly (figures 3 and 4 on the following pages.)

Total calls per hour of the day over 1 year (GP1)

850-900 calls per working day in a practice with a list size of 16,100
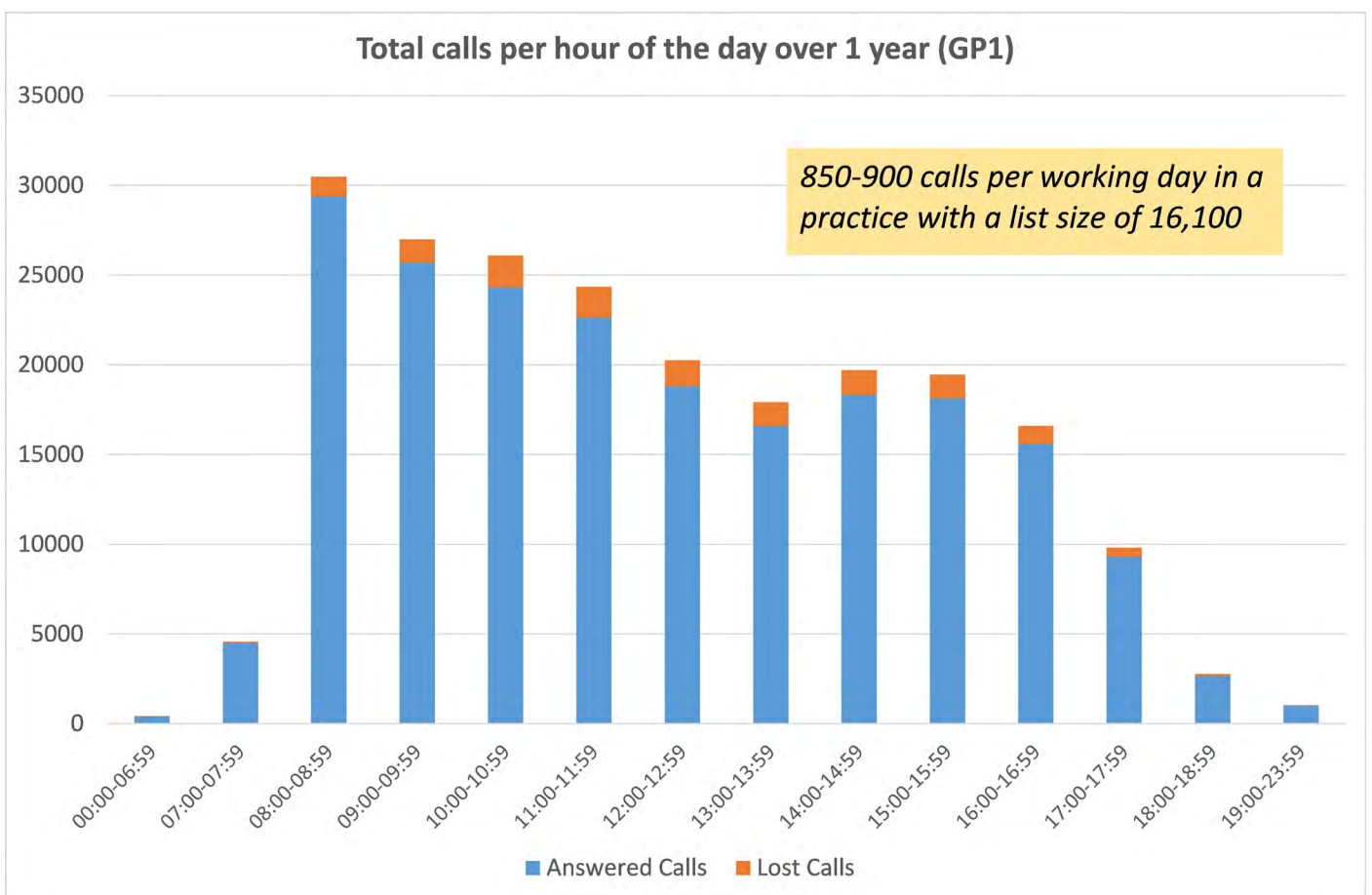
Legend: ■ Answered Calls ■ Lost Calls

Figure 3. Total calls per hour of the day over 1 year, participating practice
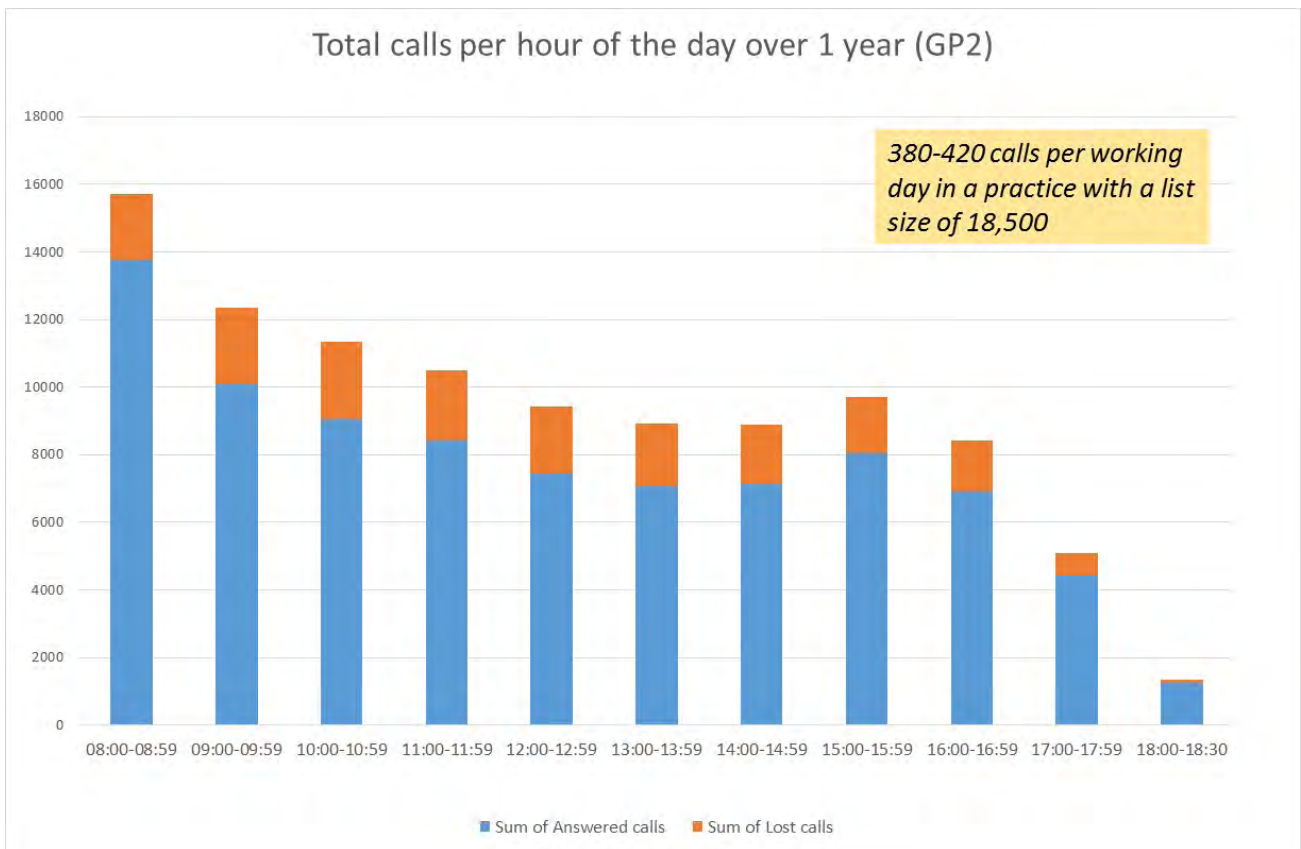
Figure 4. Total calls per hour of the day over 1 year, participating practice

In the one practice where data could be identified by month, there were possible differences in the volume of calls between months, although chance variation cannot be ruled out (Figure 5). For example, there were 2610 more calls made in the month of March 2015 compared to May 2015 (9779 vs. 7169 calls).
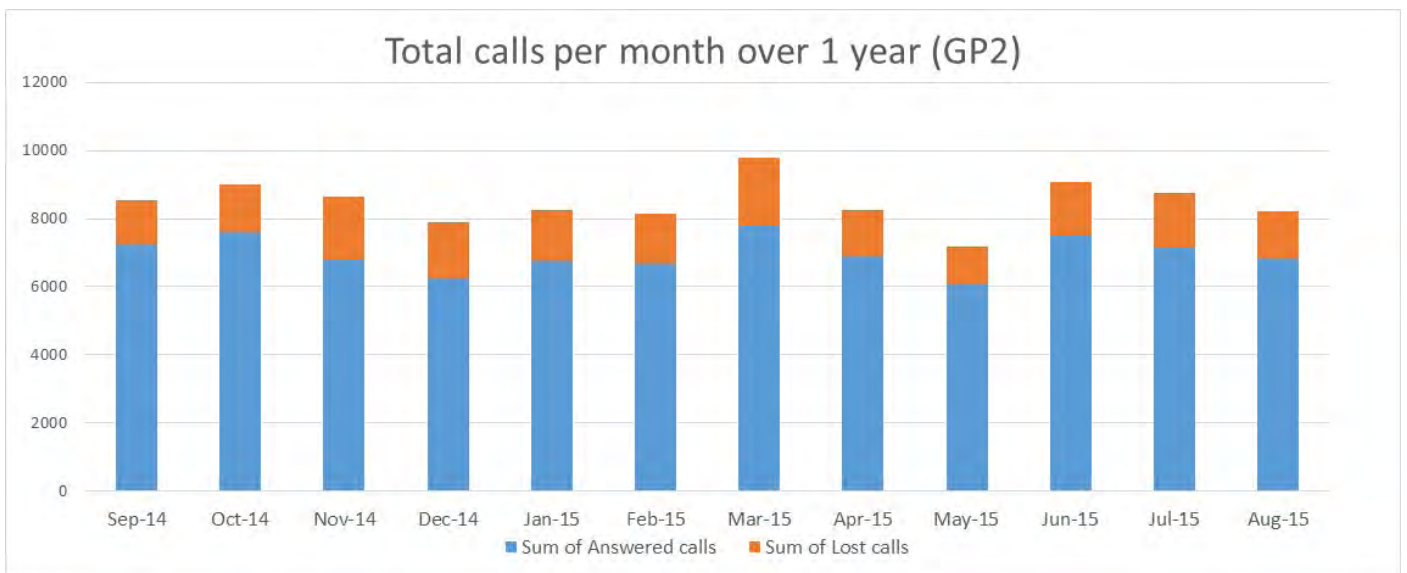
Figure 5. Total calls per month, participating practice.

Further analysis of the number of incoming calls by month and timeslot reveals a smooth pattern for answered calls Figure 6 as opposed to lost calls Figure 7. This difference in patterns may suggest that better allocation of capacity to handle incoming calls during the day may lead to decreases in the number of lost calls.
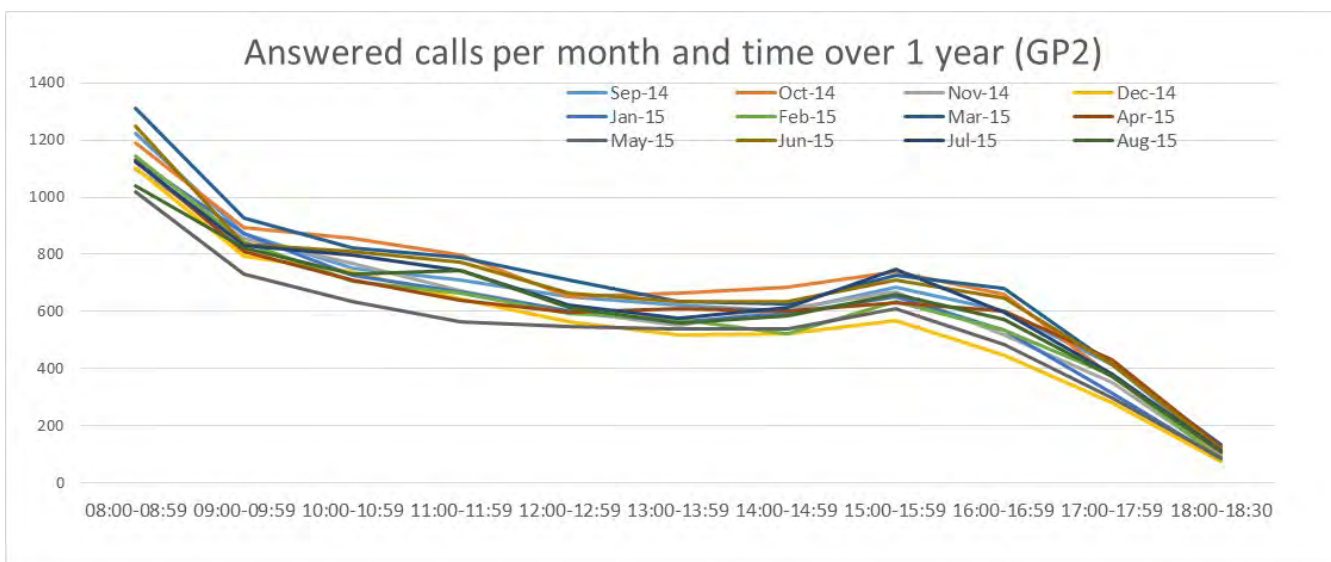
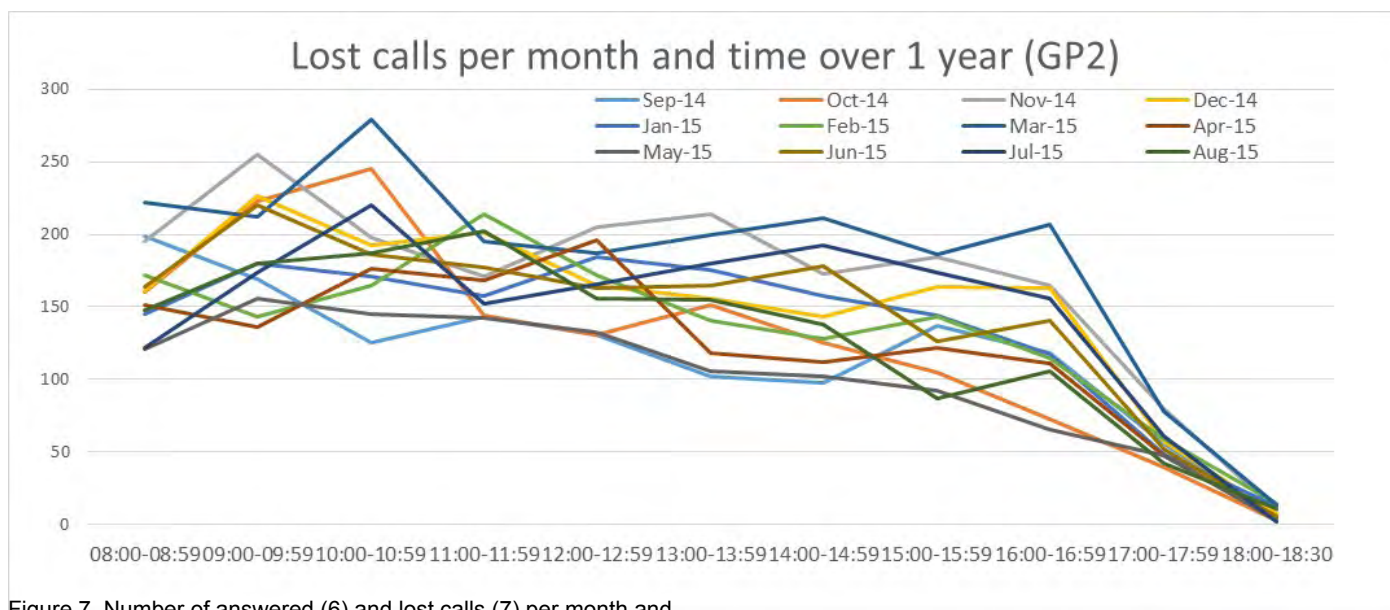Figure 6. Answered calls per month by time of day

Figure 7. Number of answered (6) and lost calls (7) per month and time of the day

Appointment Systems

There was less variation in the type of computer systems the sampled practices used to organise their appointments. These systems allow practices to share data in real time and can exchange information with secondary care.

Appointment system	# of practices using it
EMIS WEB	7
SystmOne	6
Vision	1

However, there was substantial variation in the methods and systems practices have in place to organise capacity, the type and terminology of appointments they offer (eg urgent, non-urgent, phone appointments etc) and the way the record this information. This means that it is very difficult to summarise the appointment data collected from practices in a meaningful way.

However an early initiative in Bath and North East Somerset CCG has indicated the potential of using incoming call data and the date that an appointment was arranged (not the date of the appointment) as a possible proxy measure for demand. Work to refine this approach is ongoing within the CCG.

We asked for an indication of when their next second available appointment would be. The 'second next appointment' (and sometimes 'third next') is a measure of the delay patients experience in accessing the practice. It is considered a better measure of access than the 'next appointment' since the next available appointment may have become available due to a cancellation or other event that is not

entirely reliable.

There was considerable variation among the practices in terms of when the second next is available, Figure 8.

This finding (bearing in mind that it was derived at a single point in time and thus is prone to random and systemic biases) may suggest that practices experience the mismatch between demand and capacity in a differential manner.
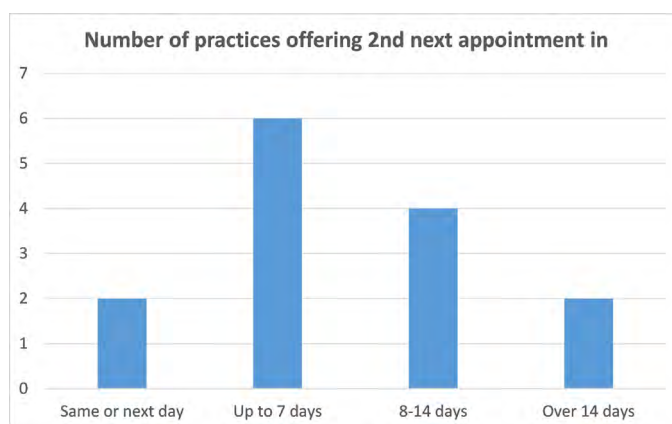

Figure 8. Number of practices offering 2nd next appointment

Online survey

We requested that an online survey be circulated to practices via primary care leads at each CCG, asking them to provide information on the telephone and appointments systems in use, what data these systems collect, and how practices currently use the data to manage demand.

We only received seven direct responses to the survey from practices and all were within the Swindon CCG area.

The other CCGs were unable to send out the survey within the timescale.

Name of Telephone system and number of years in use	Practices extracting and analysing data from telephone sytem to understand levels of demand
IPECS. 6 months	No
NEC in house. 5 years	No
NEC. 3 years	No
Samsung. 1 year	Sometimes
iPECS. 3 years	Sometimes
LG Nortel. 5 years	Yes
Avaya. 10 years	No

Figure 9. Phone systems in use and practice to extract data

# of practices with telephone systems which enable them to export data on:		
The number of calls received every hour	6	0
How many calls are lost	1	4*

Figure 10. Functionality of telephone systems
* No answer given from one practice

Name of Appointment System	Practices extracting and analysing data from appointment system to plan capacity
EMIS Web	Yes
SystmOne	Yes
SystmOne	Yes
SystmOne	No
SystmOne	No
SystmOne	No

Figure 11. Name and functionality of appointment systems

In addition, we worked with the One Care Consortium, which covers Bristol, North Somerset and South Gloucestershire, to analyse results from the One Care Telephony Survey carried out in 2013/14. 22 practices took part in the survey.

The survey asked providers to identify:

- The name of their telephone system provider

- Whether the system was owned or leased

- The call management functions of the telephone systems

- What information the system provided.

BT	1
Comms plus	2
Daisy	2
Channel communications	3
PSU	1
Glamorgan	1
MPS	2
CNS	3
Datasharp	1
SW comms	3
Panasonic	1
Berry Telecom	1
Arrow	1

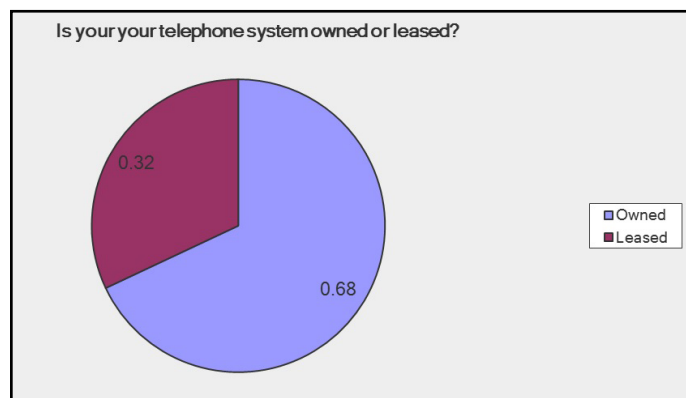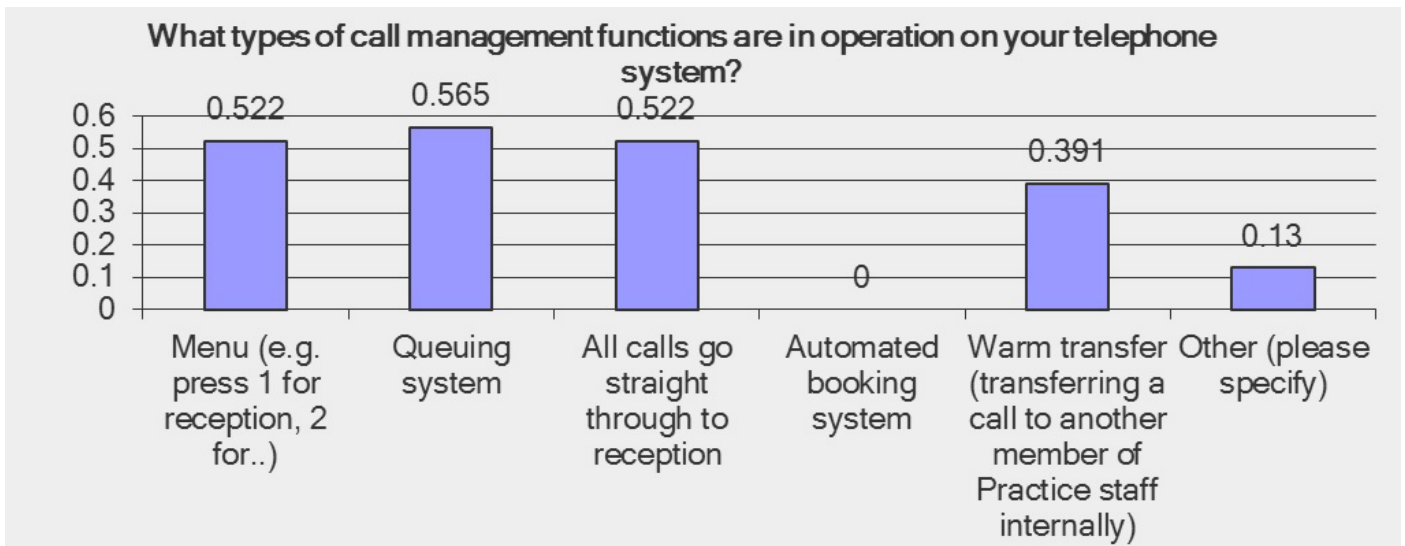Figure 12. Name of telephone system provider

Is your your telephone system owned or leased?

0.32

0.68

Owned
Leased

Figure 13. Owned or leased status

What types of call management functions are in operation on your telephone system?

Category	Value
Menu (e.g. press 1 for reception, 2 for..)	0.522
Queuing system	0.565
All calls go straight through to reception	0.522
Automated booking system	0
Warm transfer (transferring a call to another member of Practice staff internally)	0.391
Other (please specify)	0.13

Figure 14. Call Management function of phone systems

Of the following, what information does your current system provide?

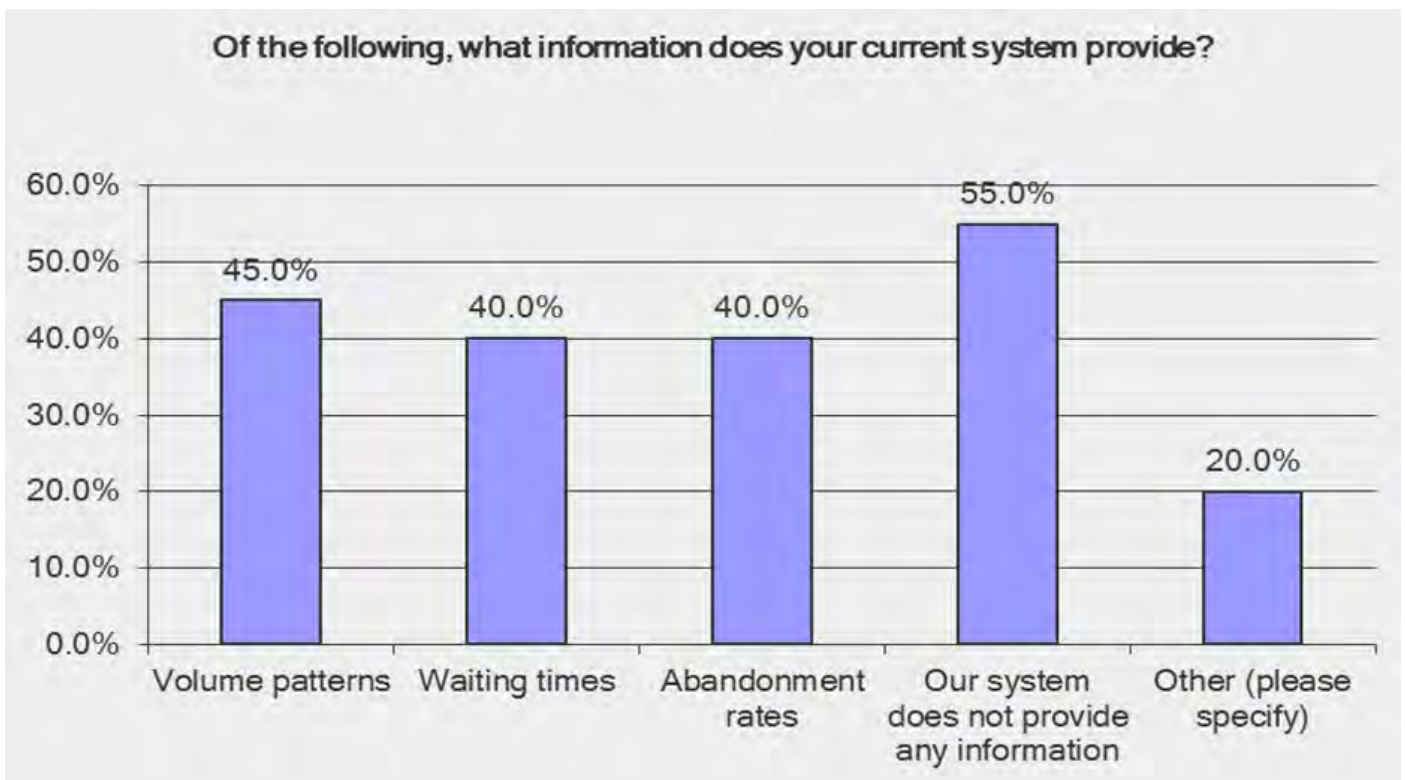| Category	Value
Volume patterns	45.0%
Waiting times	40.0%
Abandonment rates	40.0%
Our system does not provide any information	55.0%
Other (please specify)	20.0%

Figure 15. Information provided by each telephone system

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Summary

The aim of this study was to identify what appointment and telephone systems were being used within Primary Care to measure and manage patient demand for appointments.

Although GPs face very similar long-term challenges and operational problems, we found a significant variation in the ways in which practices collect and use their telephone data, and a myriad of approaches towards deploying capacity to meet the needs of patients.

More specifically, these sources of variation include but are not limited to:

- Types of IT systems they use to handle phone calls and organise appointments. Of the 14 practices interviewed, there were three appointments systems in operation and 10 different telephone systems.

- Additional disparity in the types and practices of data collection and if and how data is being used for planning purposes.

- Practices and methods of handling calls and organising capacity.

- Types of appointment they offer including phone and face to face consultations with doctors and nurses, triage systems, different accessing appointments, terminology used to refer to the different systems and practices in place.

- Time to second next available appointment (an indication of patient access to services).

- Workflow and general operations management practices such as deployment of receptionists during the day and ring fencing time for specific tasks (eg phone call handling only during specific times of the day).

In addition, we identified a number of challenges for Primary Care, including:

- Optimising the role of primary care within the continuum of an integrated health and social care system.

- Accelerating technological innovation and diffusion of best practice.

- Dealing with workforce issues including current and anticipated staff shortages.

- Reducing variation in the way practices are organised.

- Developing methods for measuring/forecasting demand and planning capacity.

Approaches to measuring demand

Our interviews with practices across the region highlighted a number of issues. Often, practice managers expressed an urgent need to understand how they could significantly reduce their wait times for routine appointments without employing more clinical staff.

However, due to a variety of reasons, the majority of the practices involved in the study did not actively measure demand (or fully understand the extent of demand). Rather, the majority focus on

managing demand using a utilisation approach - that is, they estimate demand based on how much of their current capacity is used. This excludes latent demand, either because capacity cannot cope with a certain volume of contacts, whether that be telephone or face to face or because demand is affected by supply. The general approach is one of trying to fit demand around existing capacity.

At the same time, it is not clear whether this inadvertently causes supply induced demand in some practices. The picture is one of practices continually attempting to improve and modify operational efficiency rather than planning capacity based on evidence regarding the quantity and type of demand.

The absence of any common tool, both for measuring demand and measuring performance against that demand, results in difficulties for practices who want to evaluate any changes they make, often resulting in 'reactive change' based on intuition, goodwill and hope. From numerous triage arrangements to open surgeries, the emphasis for practices is on coping and 'quelling' unmanageable levels of demand.

In addition, the desire to meet increasing levels of patient expectations often results in continual operational change with many staff experiencing 'change fatigue' in their ongoing quest to deliver more immediate services to a greater volume of patients.

The findings of our study highlight that without knowing the level and characteristics of demand, it is hard to design effective interventions and evaluate their impact. There is a risk of interventions being targeted at the wrong patient groups or resources spent on service changes that have unmeasured and unintended negative consequences on practices' ability to manage demand in a sustainable way.

Conclusions

There is a strong perception of increased demand for general practice services and this is supported by practices' response to this pressure by changing their appointment systems and increasing the number of appointments.

Measuring and understanding demand is a prerequisite to doing something about it and evaluating its impact. There is no consistent or widespread use of any particular tool to measure demand.

However, there is potentially a significant minority of practices who may be able to record call volume data which is a reasonable proxy measure for demand. Call volume data would constitute an important component of a minimum data set that could be collected from practices to demonstrate real time demand while also contributing to model to predict future demand.

Recommendations

Creating a Regional Vision for Measuring Demand in Primary Care

There is currently no single measurement method which accurately measures demand in primary care. There are, however, a number of CCGs working to support their practices to better understand demand, and in particular, how it impacts on secondary care.

A realistic objective would be for the majority of practices to be regularly uploading, preferably in real-time, measures of demand to a database that can show current levels of demand in general practice, while also contributing to a self-learning model capable of predicting demand at any time point in the future. Being able to estimate future demand would allow for workforce planning and also the ability to test the impact of any interventions on demand. These interventions could be at any level from the Practice to national resource allocation.

Given the variability in the way practices organise and plan their capacity through their appointment systems, a sensible way forward is to use telephone calls as a proxy for demand. Consequently, we need to ensure that a minimum data set can be generated and collected at GP practice level, and analysed at both practice and aggregate levels (eg Locality, CCG, West of England and nationally).

Why do we need a minimum data set? What are the benefits for CCGs?

There is a need to define proxy measures of demand if we are to better understand patterns of demand, how it changes over time (at practice, CCG, region levels) and to allow for an evidence-based approach to suggesting changes in the provision and organisation of capacity

A collaboration between CCGs and GPs could develop an appropriate demand measuring method. Initially we are suggesting developing a method that starts with a minimum data set (MDS), possibly consisting of date and time stamp of incoming call, duration of call and disposition (eg answered, resulted in face-to-face appointment, phone appointment, lost etc.).

At a second stage additional variables may be included if they add to the capacity of predicting demand and associated workload, eg practice appointment system data, Met Office data, internet search term activity and others. The measuring method can be applicable at practice level, but also at locality, CCG, regional and national level for planning.

The objectives of an initial study on the feasibility, validity and applicability of MDS would include:

- To ascertain the level of investment required by practices in the region to develop capacity for recording incoming call data.

- To determine the minimum number of data items that need to be captured for each telephone call in a feasible, cost effective and useful manner.

- To identify how volume and patterns of incoming calls translates to demand for service capacity (eg face-to-face appointment with doctor or nurse, phone call appointment, no

appointment etc).

- To develop and test an initial portfolio of statistical methods that can be used to forecast number of calls per GP, CCG and region, per day and hour within the day, for weeks/months in advance.

Potential questions to be addressed by a research project

In order to develop the minimum data set we would need to understand:

- How much would it cost to get a reasonable proportion of practices able to collect and submit data with sufficient granularity?

- What are the logistical challenges of developing and implementing a minimum data set?

- What are the specific items of the minimum data set?

- What real-time measures of demand can they be developed from the minimum data set? How would they inform planning at the practice level?

- How should the data be merged and used for regional planning purposes?

- Which statistical and forecasting methods are best suited for forecasting volume of calls and subsequently appointments, and how accurate are they?

Overview of approach / next steps

The next stage of a feasibility study should try to address the research questions listed above. The study could be concluded within 8-12 months. It should involve a small number of practices that already have the capacity to collect phone call data and a number of practises that do not but are willing to install. The financial resources should allow for:

- Installing phone call collection capacity in those practices that do not currently have.

- Collection, merging and cleaning of data from the collaborating GPs.

- Research time to develop and test appropriate statistical forecasting methods, including appropriate support by senior researcher.

- Qualitative, implementation research to evaluate the barriers and facilitators of rolling out the method at regional level.

Funding can be sought from local/regional sources and, potentially from national funders. Specific technical know-how does exist within various West of England research centres and units so the work could be carried out in a more efficient and locally nuanced manner.

One of the deliverables of the feasibility study should be a draft of a proposal for a national funder such as NIHR to support the implementation of the developed methods at regional and national levels and to evaluate its impact.

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Relevant Organisations

General Practice Improvement Programme
http://gpip.co.uk/

GP Access
http://gpaccess.uk/

NHS Institute for Innovation & Improvement (productive series) now NHS Improving Quality
http://www.institute.nhs.uk/productive_general_practice/general/productive_general_practice_homepage.html
http://www.institute.nhs.uk/productive_general_practice/general/case_studies.html

Practice Management Network
http://www.practicemanagement.org.uk/265

Primary Care Foundation
http://www.primarycarefoundation.co.uk/about-us.html

Royal College of General Practitioners Scotland-treating access
http://www.rcgp.org.uk/treating-access

Appendices

Appendix 1. Study flyer

CALL FOR EXPRESSIONS OF INTEREST THE WEST OF ENGLAND ACADEMIC HEALTH SCIENCE NETWORK (AHSN) HAS LAUNCHED A NEW STUDY TO EXPLORE DEMAND IN GENERAL PRACTICE

General Practice is under enormous pressure from increasing patient demand. While there are lots of ideas on how to manage this, little is known about how best to measure and predict demand.

The West of England AHSN is looking to work with two GP practices in each CCG area (Bath & North East Somerset, Bristol, Gloucestershire, North Somerset, South Gloucestershire, Swindon and Wiltshire) to understand how they currently measure and manage demand and how routinely collected data can help to predict this demand and strengthen capacity planning. Participating practices will be able to learn from each other and can choose to be involved in the long term should the West of England AHSN receive significant funding to expand the study. Involvement in the study will entail a visit to your surgery (this will take no more than 1.5 hours), submission of basic data, and a follow up phone call. Louise Howell (West of England AHSN) and/or Dr Christos Vasilakis (Bath University) will be carrying out the visits during the period 1st – 11th September).

During the visit, we will be exploring three key areas: What telephone system you use, a basic explanation of how it works and for you to provide us with any available retrospective data for the past 12 months. What appointment system you use, a basic explanation of how it works and for you to provide us with any available retrospective data for the past 12 months.

A time frame for the next (second) available appointment for a patient to see a GP and a Practice Nurse.

We would also like to speak to a GP within your practice regarding your current approach to managing demand and how the use of data and demand management tools might help. Each visit will be followed up with a phone call and support to submit your data. All data will be cleansed of patient / practice details. Each practice will receive £200 expenses to cover the cost of any administrative time relating to data collection. The executive sponsor for the study is Dr Ian Orpen, Chair, Bath and North East Somerset CCG. Please contact Louise Howell by Tuesday 30th August 2015 if you would like further details or to nominate your practice. louise.howell@weahsn.net.

The West of England AHSN Commissioning Evidence Informed Care programme works with Clinical Commissioning Groups to apply evidence and evaluation to all commissioning and clinical challenges.

To watch a video of Dr Peter Brindle introducing the CEIC programme, please visit http://www.weahsn.net/our-work/quality-improvement/commissioning-evidence-based-care.

Appendix 2. Interview templates – GP / Practice Manager

Practice:		Visit arranged with:
Date of Visit:		
Name of Practice Manager		
Named GP:		
Consent Form Signed:	Y	N
Introductions:	• Plan for the next 1.5 hours. • Outline the work of the West of England AHSN / purpose of the study • Practice manager to sign consent form • Practice manager to give a brief introduction to the practice. List size, team size (configuration), and opening hours. • Brief outline of any major challenges	
Practice Manager Session	**Name:** **Role:**	
Data Collection		
Q1	What telephone system do you use? For how long?	**Name of system:**
Q2	What appointments system do you use? For how long?	**Name of system:**
Q3	Do you collect data from the above systems?	**Notes:**
Data Analysis		
Q4	Do you analyse that data? How often? What does it tell you?	**Notes:**

Q5	Do you analyse data from the above to help plan your capacity ie no. of Drs / Nurses etc you need for the week ahead?	Notes:
Q6	Agree on what data they can provide us with and in what format. Ask them to submit within 10 days.	Date for data submission:
Working practice		
Q7	How long is your standard wait for a routine appointment?	
Q8	Can you give us an indication of when your next second available appointment is? Standard not emergency.	
Q9a	How much consultation time in total do your GPs spend and how has this changed over the past couple of years	
Q9b	How much time do your GPs spend on phone appointments? Arrangements for phone triage?	
Q9c	How much time do your GPs spend on home visits? Per appointment / percentage of working time.	
Q10	Payment: Would you like help with costs to collect the data?	Y N
Discussion on challenges / what would help, ie would a predictive modelling tool be helpful?	Notes:	

GP interview (Semi structured)	Introductions Name: Position: Time in post:	
Q1	To what extent has demand (measured in volume) increased in your practice? If significantly, can you evidence this?	Evidence / Examples
Q2	Are there ways in which you'd like your practice to be more productive / efficient in order to cope with increased demand?	
Q3	Have your patients expectations significantly increased or stayed the same? Over what time period?	
Q4	Do you have an increasing number of patients with complex needs? What risk stratification method do you use for prioritising patients – is it subjective or objective?	
Q5	Do you think there is duplication of info / services across general practice and second-ary care?	
Q6	What do you currently do that could be done elsewhere? Ie what are GPs best at and what is time consuming for you but adds little value?	
Q7	How does that impact on you? (Changing nature of role and job satisfaction)	
Q8	Do you have any recruitment challenges / views on career appeal etc	

Appendix 3. Consent form for visit / interview

<div align="right">Please initial the box</div>

1. We confirm that we have read and understand the information sheet for the Primary Care Demand Study and have had the opportunity to ask questions.	
2. We agree to take part in the visit from the West of England AHSN.	
3. We agree to collect and submit the necessary data within the agreed timeframe.	
4. We agree to the visit being audio recorded.	
5. We agree to the use of anonymised quotes in publications.	

_____   _____   _____

Name of Practice   Date   Signature

_____   _____

Louise Howell
West of England AHSN   Date   Signature

Appendix 4. Interview templates – Prime Minister Challenge Fund Sites - Leadership Interviews

Name of Pilot:

Name / introduction: As (Title) you hold overall responsibility for (Name of pilot) - the Prime Minister Challenge Fund site.

Interview questions.

Can tell us a little about how the idea for the project came about?

There are a number of GP practices involved in the project. How have you managed to positively engage with those practices and how do they engage with others– particularly in agreeing on a shared vision?

Are there results of the project that you're particularly proud of?

Thinking about challenges, what have been the main barriers to meeting your objectives?

Have there been any unexpected consequences and how have you overcome them?

Whilst we know that general practice is facing unprecedented levels of demand, and that patient expectations are increasing, there are some who believe that levels of demand are at times used as smokescreen for inefficient or unproductive practice. What do you think primary care could learn about productivity and innovation?

What support do you think primary care needs to be able to introduce ways of working, to offer higher quality services to patients and to adopt new business models?

What do you think are the top three biggest challenges facing primary care today?
How would you like to see these resolved?

What are your aspirations for General Practice in your locality? Do you feel positive about the future?

Lastly, if you could change one thing about the primary care system first thing tomorrow morning, what would it be?

Appendix 5. Online Survey Template

- What is the name of your practice?
- What is the name of the telephone system you use?
- How long have you used it for?
- Do you extract and analyse data from your telephone system to help you understand levels of demand for your service?
- Does your telephone system enable you to export data on:
- A) the number of calls you receive every hour
- B) how many calls are lost
- What is the name of the appointment system you use?
- Do you extract and analyse data from your appointment system to plan your capacity? ie number of staff needed

Appendix 6. Evidence Scan

Rapid review of current evidence on the topic of GP practices' measurement of their demand and their patient flows

Alison Richards 28 August 2015

Purpose: To inform a grant bid

QUESTION PICO

Participants
GP Practices in the UK (NHS)

Intervention
Measurement of demand for services/ patient flows (peaks and troughs)

Comparator
No measurement of demand

Outcomes
Primary: Management of demand/ patient flows

Summary of findings
The level of evidence found on this topic was low. No systematic reviews or trials were identified. A comparative study, a narrative review, several pieces of methodology literature including guidance notes and workbooks and several case studies were identified which included the topic of demand and flow measurement in General Practice but there was little evidence of long term follow-up of initiatives.

What we searched:
We searched Medline, the Cochrane Library, HMIC and Business Elite for any material on the topic. We searched from 1990 to the present for English language material only but did not restrict to any particular study type. Of the 402 items identified and screened 19 were identified as possibly relevant and the full text read. We then also searched for other (grey) literature such as reports, pamphlets, presentation materials etc. commencing with a first five pages search of Google. We then searched through identified items to look for any further relevant material. It should be noted however that this was not an exhaustive search for all possibly relevant material.

What we found:
- We found no guidelines, systematic reviews or randomised controlled trials on this topic.
- We found one comparative study[1] which included a comparison of a demand measure (appointments) between two sets of GP practices
- We found one narrative review by Benett[2] which identified several methodologies for GP practice access improvement all of which included components dealing with demand measurement
- In the methodologies identified in the Benett review we found guidance material and workbooks for demand measurement
- In the methodologies identified in the Benett review we also found a number of case studies from GP practices with some details of how they had measured their demand
- It should be noted we found no detailed analysis, comparisons or follow-up of most of these initiatives, apart from some literature on

the 'Advanced Access' initiative but as this was not an exhaustive search it is possible some further literature may exist

- We found a great deal of literature on the related topic of demand management including supplier- led demand[3] but we have not selected this except where we could identify coverage of the topic of demand measurement.

What the evidence says: summary

- In the results of a comparative postal survey[1] slightly more practices involved in the Advanced Access imitative (see below under methodologies) were collecting data on demand for appointments than those who were not taking part in the initiative (85% v 71%) but the overall figure for data collection amongst all responders was high.

- The importance of selecting a suitable method for data capture as a first step to demand management is emphasised by Benett[2] and recurs as a theme in the methodologies he identifies. He recommends two of the approaches; one is a DIY approach, the 'how-to guide'[4] and the other a consultancy offer, the General Practice Improvement programme (GPIP)[5].

- Case studies offer evidence of at least initial success of some of the measurement strategies introduced but we could not identify any very long term follow up that might indicate lasting effects. Case studies were identified for most of the methodologies outlined below and most include an element of detailed data capture as an important first element of an improvement initiative.

What the evidence says: details of methodologies and toolkits identified

The following methodologies are summarised and appraised by Benett. He does not claim that this is an exhaustive list. They are listed here as listed in the review.

- **Primary Care Foundation** - see below for website details. This organisation offers a consultancy service and toolkit. There is a sample report available from the website[6][7] which includes analysis of demand (for example logging phone calls, analyses of what patients came in for over a period). There is a list of clients which include NHS Bath and NE Somerset and South Gloucestershire but no case studies.

- **Advanced Access** - this is a methodology from the USA which was introduced to the UK in the early noughties but was not universally well received. It includes a demand measurement component (tick sheets over a period to enable the practice to understand its demand). We identified a Canadian example of a workbook for this methodology[8]. Advanced Access was also evaluated by the NHS in 2007[9] but this report does not mention demand measurement specifically. The comparative study identified in the search[1] also relates to this approach and does mention demand measurement.

- **Treating Access:** a toolkit for GP practices to improve their patients' access to primary care[10]. See the RCGP website for detailed information and downloadable worksheets to measure demand. We have found no case studies so far on this approach.

- **World Class commissioning: High quality Care for all primary and community Services - Improving GP access and responsiveness**[11]. Section 2 of this document called Mapping the Baseline mentions measuring demand very briefly in terms only of tracking appointment requests (p22) but does also feature some case studies including one from Tower Hamlets PCT in London (p39 and p60) where demand measurement is a key component. *'Key learnings from the Tower Hamlets experience • Rely on data, not intuition. There may be a lot of accepted wisdom about why access is as it is, and why efforts to improve it are futile. This needs to be tested against the facts.'*
- **Improving Access- responding to patients. A 'how-to guide for GP practices.** This guide[4] has been written by GP practice managers and includes a detailed 'do it yourself' guide to data collection in section 1 - Do you understand your demand? There is also a case study from Barnsley, UK.
- **Telephone Access** - this is methodology whose solutions largely seem to involve greater telephone use. It emanates from a consultancy organisation called GP Access with a website (see below) and various case reports from clients[12 13]. It includes a method of data capture (Navigator) which it claims helps practices to understand and measure their local demand.
- 'The new way of thinking is demand led – how can we predict the demands of our population and meet them in the most effective and efficient manner?'
- **Productive general practice** – this is an approach devised by the NHS institute for Innovation and Improvement and currently still being maintained by NHS Improving Quality (NHSIQ). It requires a licence to use. There is useful overview guide[14] and a descriptive document of the 'knowing how we are doing module' [15]that includes looking at current demand. It includes several case studies, some from the West of England all of which have looked at demand measurement[16-22].
- **General practice improvement programme** – this consultancy service is being run by two organisations, one of which (KM and T) collaborated on the 'Productive Series' and their work appears to build on this[5] . The component relating to demand called 'chasing the tail' appears quite sophisticated and can include detailed profiling of demand segments, eg 'frequent flyers'. There are two case studies featuring this on the website - address below.

Search strategies and results

Database/website	URL of source and details	Search terms and date of search	Hits
OVID Medline	Via Bristol University Library	See below 26/8/15	234
Wiley Cochrane	http://www.thecochranelibrary.com/	See below 26/8/15	16
HMIC	https://www.evidence.nhs.uk/ search	See below 26/8/15	96
Business Elite	https://www.evidence.nhs.uk/ search	See below 26/8/15	73
Google	www.google.co.uk/ Top 5 pages	General practice demand flow measure 26/8/15	7
NICE	http://cks.nice.org.uk	As above 26/8/15	0
Kings Fund	www.kingsfund.org.uk/	As above 26/8/15	No additional
Practice management network	http://www.practicemanagement. org.uk/265	As above 26/8/15	No additional
Nuffield Trust	www.nuffieldtrust.org.uk/	As above 26/8/15	No additional
Royal College of GPs	www.rcgp.org.uk/	As above26/8/15	0

Ovid Medline Search strategy (also adapted for Cochrane via Wiley and HMIC and Business Elite via NHS Evidence)

Database: Medline 1950 to present   Search Strategy:

1. exp *General Practice/og [Organization & Administration] (3837)
2. *physicians, family/og or *physicians, primary care/og (181)
3. ((general or family) adj (practice or practices or practitioner*)).ti,ab. (68721)
4. (GP adj (practice or practices or service or services or surgery or surgeries or clinic or clinics)).ti,ab. (1018)
5. 1 or 2 or 3 or 4 (71472)
6. Health Services Accessibility/ or "Health Services Needs and Demand"/ (94457)
7. ((patient or patients or client*) adj4 (access* or demand* or flow*)).ti,ab. (34093)
8. (service* adj3 demand*).ti,ab. (2484)
9. 6 or 7 or 8 (127836) or flow*)).ti,ab. (120156)
10. ((measur* or assess* or calculat* or estimat* or survey* or model* or gaug* or research*) adj9 (demand or flow*)).ti,ab. (120156)
11. exp models, statistical/ (301443)
12. 10 or 11 (418687)
13. 5 and 9 and 12 (228)
14. demand.ti. (7106)
15. 5 and 9 and 14 (79)
16. 13 or 15 (281)
17. letter/ (916537)
18. editorial/ (371042)
19. news/ (166518)
20. exp historical article/ (342128)
21. Anecdotes as topic/ (4693)
22. comment/ (618398)
23. (letter or comment$).ti. (98572)
24. animals/ not humans/ (3999797)
25. exp Animals, Laboratory/ (757998)
26. exp Animal Experimentation/ (6839)
27. exp Models, Animal/ (448128)
28. exp rodentia/ (2784064)
29. (rat or rats or mouse or mice).ti. (1115410)
30. or/17-29 (6577388)
31. 16 not 30 (278)
32. limit 31 to (english language and yr="1990 -Current") (243)