

Kent Academic Repository

Full text document (pdf)

Citation for published version

Forbes, Lindsay and Forbes, Hannah and Checkland, Kath and Sutton, Matt and Peckham, Stephen (2020) Exploring changes in patient experience with increasing practice size: observational study using data from the General Practice Patient Survey. *British Journal of General Practice*. ISSN 0960-1643. (In press)

DOI

Link to record in KAR

<https://kar.kent.ac.uk/81230/>

Document Version

Author's Accepted Manuscript

Copyright & reuse

Content in the Kent Academic Repository is made available for research purposes. Unless otherwise stated all content is protected by copyright and in the absence of an open licence (eg Creative Commons), permissions for further reuse of content should be sought from the publisher, author or other copyright holder.

Versions of research

The version in the Kent Academic Repository may differ from the final published version.

Users are advised to check <http://kar.kent.ac.uk> for the status of the paper. **Users should always cite the published version of record.**

Enquiries

For any further enquiries regarding the licence status of this document, please contact:

researchsupport@kent.ac.uk

If you believe this document infringes copyright then please contact the KAR admin team with the take-down information provided at <http://kar.kent.ac.uk/contact.html>

Exploring changes in patient experience with increasing practice size: observational study using data from the General Practice Patient Survey

Dr Lindsay JL Forbes, Senior Clinical Research Fellow, BSc, MSc, MD, FFPH¹

L.Forbes@kent.ac.uk

Ms Hannah Forbes, Research Assistant, BA, MSc²

Professor Matt Sutton, Chair in Health Economics, BA, MSc, PhD²

Professor Katherine Checkland, Professor of Health Policy and Primary Care, MBBS, BMedSci, MRCGP, MA,
PhD²

Professor Stephen Peckham, Director, BSc(Hons), MA, HMFPH¹

¹Centre for Health Services Studies, University of Kent

²Division of Population Health, Health Services Research & Primary Care, University of Manchester

Abstract

Background For the last few years, English general practices, which are traditionally small, have been encouraged to work together to serve larger populations of registered patients, by merging or collaborating with each other. Meanwhile, patient surveys suggest worsening continuity of care and access to care.

Aim To explore whether increasing size of practice population and working collaboratively are linked to changes in continuity of care or access to care.

Design and setting Observational study in English general practice using data on patient experience, practice size and collaborative working

Methods The main outcome measures were General Practice Patient Survey practice-level proportions of patients reporting positive experiences of access and relationship continuity of care. We compared change in proportions 2013-2018 among practices that had grown and those that had stayed about the same size. We also compared patients' experiences by whether practices were working in close collaborations or not in 2018.

Results. Practices that had grown in population size had a greater percentage fall in continuity of care, by 6.6% (95% confidence interval 4.3% to 8.9%) than practices that had stayed about the same size, after controlling for other factors. There was no similar difference in relation to access to care. Practices collaborating closely with others had marginally worse continuity of care than those not working in collaboration and no important differences in access.

Conclusion Concerns that larger general practice size threatens continuity of care may be justified.

Key words

Family Practice; General Practice; Models, Organizational; Policy; England

How this fits in

Primary medical care in England has traditionally been delivered by small general practices. Over the last few years, they have been encouraged to grow or to work collaboratively to serve larger populations. We found no convincing evidence that practices that have responded to this encouragement have better patient-reported access to care, but they may have worse relationship continuity of care.

Introduction

Traditionally, general medical practices in England are relatively small: in 2018, most practices were led by a partnership of general practitioners (GPs) (mean 3-4 full time equivalents), employing a multidisciplinary team and delivering primary care to a mean of 8000 registered patients.¹ Since 2014, the idea that general practices should work 'at scale' – in other words, work together to deliver services to larger populations – has been a central element of English health service policy. Working 'at scale' was intended to enable them to innovate, make savings, support staff better, become more resilient, have a stronger voice in negotiations and facilitate longer opening times.² The evidence to suggest that serving a larger population of patients achieves these aims is, however, limited, as is the evidence about possible negative consequences.^{3,4,5}

Between 2014 and 2018, guidance from NHS England on how practices should work together – what 'working at scale' meant – was not prescriptive. It set out a number of options, including merging with others to form new single organisations, or forming groups linked by different types of agreement, in which individual practices retained variable degrees of autonomy.^{6,7} By 2018, the average number of patients registered per practice was growing and mergers joining several practices into single business units were becoming more common.⁸⁻¹⁰ Practices were also increasingly participating in collaborative groups,¹¹ although there is evidence that some had been working in this way for several years before 2014.^{12,13} While there have been some surveys and evaluations of these organisational models,^{3,12-14} NHS England has not collected data systematically on the extent of their implementation.¹⁵ However, from our previous work and that of others, it was clear that a small proportion of these collaborative groups were working very closely together, with common strategy and shared risk.^{13,15}

In early 2019, NHS guidance set out more specific plans on how general practices should work together, announcing that 'primary care networks', serving 30,000 to 50,000 patients in total, should be formed.^{16 17} These were intended to be made of up of around 6 to 8 practices each covering an identifiable geographical footprint. The constituent practices were intended to remain as autonomous organisations; they were not expected to merge legally, but were expected to collaborate to deliver specific functions collaboratively.¹⁸

The formation of primary care networks in the summer of 2019 made the need for evidence of the effects of increasing the size of population to whom primary care is delivered more urgent.

A key concern about increasing size of primary care organisation is loss of continuity of care, which is highly valued by patients^{9,10} and one of the core values of good primary care.^{19,20} Continuity of care encompasses the interpersonal relationship between practitioner and patient (relationship continuity), coordination and teamwork (management continuity) and availability of records (information continuity).²¹ Better relationship continuity is associated with lower mortality,²² fewer hospital admissions,²³ fewer emergency department attendances,²⁴ and better patient experience.^{19,25} Relationship continuity of care has been falling over recent years in England.²⁶

Close collaborative working and merging, may threaten relationship continuity, because patients are more likely to see an unfamiliar health professional. If care is delivered across several sites, information continuity may become a challenge if records are not freely shared, which is particularly likely if practices are not legally joined into one organisation.²⁷

This study aimed to explore whether the fall in continuity of care and access to care could be related to the policy encouragement to increase practice size. At the time of writing, no data were available on the effect of primary care network formation. We focused therefore on two types of organisational changes – large growth in registered population and models in which practices were working together in strong collaborative groups.

Methods

We carried out two sets of analyses to examine the effect on access and continuity of care of increase the size of general practice population either by practice growth or working in close collaboration.

The first analysis, of the effect of practice growth, examined what happened to access and continuity of care in practices that had grown in registered population over 2013 to 2018 compared with those that had stayed about the same size over that period.

The second analysis, of the effect of collaboration, examined whether there was any difference in access and continuity of care in practices that were working in close collaborative groups, but not merging formally, compared with those that were not. This second analysis was necessarily cross-sectional using 2018 data because there were no data available about working in strong collaborative groups in 2013.

Identifying practices that had grown and a comparison group that had stayed about the same size

For the first analysis, we calculated the difference in size of registered population for each practice with >1000 patients between April 2013 and March 2018 using NHS Digital datasets.^{28,29} The change in registered population ranged from a fall of 5,620 patients to an increase of 60,392 patients, and the mean was an increase of 840 patients per practice. For our analysis to be meaningful, we needed to identify practices where the increase in practice size would represent a significant change in ways of working. There is no universally accepted way of defining such a meaningful increase in practice size. However, we considered that an increase of >2000 patients (roughly equivalent to gaining one additional full-time equivalent GP) would be meaningful for a small practice, although probably less so for a very large practice. We therefore categorised practices as having had a meaningful increase in size if their registered population had increased by >2,000 patients and by >20% (the percentage increase was arbitrary but determined *a priori*). This means that to be classified as having had a meaningful increase in size a practice with 4,000 patients at baseline would have to have increased their population to 6,000 patients and a practice with 20,000 patients at baseline would have to have increased their population to 24,000 patients.

We also identified practices in which the size of the registered population in 2018 had stayed within 20% inclusive of the size in 2013, as a comparison group.

We excluded the small number of practices where >30% of the registered population was aged 15-24 in 2013 or 2018, as these were all based in universities. They all had a very large registered population and most had grown in size by >20%; university practices work at this scale because they have a large number of healthy, young patients who are not resident for all of the year. The practices may have grown because of the rising student population,³⁰ not because of the benefits envisaged by national policy. We therefore considered that they were not relevant to this analysis. We also excluded practices with fewer than 3000 patients at baseline. This is because they are likely to represent partnerships of fewer than 2 full-time equivalent GPs and were therefore atypical and likely to have been planning to expand their patient list in any case, not because of the encouragement of national policy.

Identifying practices working in collaboration

We used a dataset that we had developed about the extent to which practices had been working in close collaboration in early 2018, as set out in our previous paper.¹⁵ We found that we could identify three different kinds of practice:

- Working closely in collaboration to deliver core GP services (as defined in national contracts with NHS England extant at the time^{31,32}) collectively to >30,000 patients. Some of these groups were very large single business entities, and others were working as part of superpartnerships or multisite organisations, with separate identities but shared strategy and risk.¹³
- Working loosely in collaboration to deliver services over and above core GP services (e.g. extended opening times, specialist clinics delivered in general practice) collectively to >30,000 patients. Practices in this group retained more autonomy and did not share strategy or risk.
- Not working in collaboration.

Access and continuity of care variables

To assess patients' perspectives of access and continuity of care, we used responses to the GP Patient Survey³³: this is the only source of routine data on this issue available about all English practices. Funded by

NHS England, it is a national standardised postal questionnaire survey of a very large sample of adults (~800,000 in 2017³⁴) who have been registered with a practice for at least six months. It has been running at least once a year for over 10 years. It uses stratified random sampling such that patients at every practice are selected.³⁵ The survey asks about a range of issues including overall satisfaction, how easy it was to get an appointment, opening hours, waiting times, experience of seeing a preferred GP, experience of the last appointment, current state of health and management plans.

We selected *a priori* five questions for this analysis. Only one question in the survey reflected patient experience of continuity of care, which was: 'How often do you see or speak to the GP you prefer?' (among those who said 'Yes' to 'Is there a GP you usually prefer to see or speak to?' – 46% of patients in 2017³⁴). The response categories were 'Always or almost always', 'A lot of the time', 'Some of the time', 'Never or almost never', or 'Not tried at this GP surgery'. The outcome variable that we used was the proportion in each practice with a positive response, in other words: 'Always or almost always' or 'A lot of the time'.

Access to care was measured using three questions:

- 'How satisfied are you with the hours that your GP surgery is open?' ('Very satisfied', 'Fairly satisfied', 'Neither satisfied nor dissatisfied', 'Fairly dissatisfied', or 'Very dissatisfied'). Our outcome variable was the proportion for each practice answering 'Very satisfied' or 'Fairly satisfied';
- 'Generally, how easy is it to get through to someone at your GP surgery on the phone?' ('Very easy', 'Fairly easy', 'Not very easy', 'Not at all easy', or 'Haven't tried'). Our outcome variable was the proportion for each practice answering 'Very easy' or 'Fairly easy';
- 'Were you able to get an appointment to see or speak to someone, the last time you wanted to see or speak to a GP or nurse at your GP surgery?' ('Yes', 'Yes but I had to call back closer to or on the day I wanted the appointment', 'No', or 'Can't remember'). Our outcome variable was the proportion for each practice answering 'Yes' or 'Yes but I had to call back closer to or on the day I wanted the appointment';

We also examined responses to the question about overall experience: 'Overall, how would you describe your experience of your GP surgery?' ('Very good', 'Fairly good', 'Neither good nor poor', 'Fairly poor', 'Very poor'). Our outcome variable was the proportion for each practice answering 'Very good' or 'Fairly good'.

We used GP Patient Survey data collected during January to March 2013³⁶ and January to March 2017³³ to reflect the time period over which working at scale became a central part of English policy. We did not use 2018 data because the questions had changed in that year, making trends more difficult to interpret. The percentages giving each response had been weighted by the research organisation (Ipsos MORI) to allow for unequal probabilities of selection, non-response, and non-representativeness.³⁵

Statistical analysis

Analysis of the effect of practice growth

We examined the differences between the practices that had grown significantly and the comparison group in age of registered population (% aged <5, % aged 75+); sex (% male); rurality (rural or urban); region (North; Midlands; London and South); level of socioeconomic deprivation (mean Index of Multiple Deprivation for the practice based on patients' postcodes of residence, estimated using data on 2011 Census Lower Layer Super Output Area of residence of registered patients by practice³⁷ and Index of Multiple Deprivation calculated in 2015 for Lower Layer Super Output Area³⁸); and prevalence of long term conditions (% with longstanding illness based on responses to the GP Patient Survey).

The dependent variables in the five analyses were changes 2013 to 2017 in percentages reporting positive responses to the five GP Patient Survey questions as percentages of the 2013 values. These were, for all five questions, approximately Normally distributed. We compared the dependent variable between practices that had grown significantly and comparison practices using linear regression. We included in the model the variables associated with change in practice size i.e. % aged <5, % aged >75, region, rurality, level of socioeconomic deprivation and % with long term conditions. Other researchers have also found that these

are related to performance on the GP Patient Survey.³⁹⁻⁴³ The values at different time points on the covariates were very highly correlated; we used the most recent data in the models.

Analysis of the effect of collaboration

We reported differences between the three groups of practices (close collaboration, loose collaboration and no collaboration in 2018) in age of registered population, rurality, region, socioeconomic status, and prevalence of long term conditions in our previous paper.¹⁵

The dependent variables were the percentages reporting positive responses to the five GP Patient Survey questions in 2017. These were approximately Normally distributed. We compared these between practices working in close collaboration in and those not working in collaboration, using linear regression, including the same covariates as for the previous set of analyses. To examine the effect of previous GP Patient Survey responses on the associations, we included the equivalent percentage of positive responses from 2013 as covariates in the models.

For both sets of analyses, the assumptions of linear regression models were sufficiently met. The relationships between continuous covariates and the dependent variables appeared roughly linear, the variances were similar in the comparison groups and the residuals followed near-Normal distributions.

We carried out analyses in Stata version 14, College Station, Texas.

Results

The number of practices in England with list sizes of $\geq 1,000$ patients was 7,971 in April 2013 and 7,162 in March 2018.^{1,28} We excluded eight university practices. We carried out both sets of analyses using data from the 7,089 practices with data on registered population for 2013 and 2018 and data for both the 2013 and 2017 GP Patient Surveys.

Distribution of GP Patient Survey responses in all practices

In the whole sample of 7,089 practices, the mean percentage reporting being able to see their preferred GP fell from 63% to 56% over the five-year period. Good overall experience fell slightly from 87% to 85%. Finding it easy to get through on the phone fell from 77% to 71%, being satisfied with opening hours fell from 80% to 77%, and being able to make an appointment fell only slightly from 86% to 84%.

Figure 1 shows change in mean percentages of positive responses to the GP Patient Survey over the period by size of registered population in 2018. Overall experience, being able to get an appointment, satisfaction with opening hours were high for all sizes of practice, with small falls over the time period. Being able to get through on the phone and being able to see a preferred GP appeared to deteriorate over time, and the lowest percentages were in the biggest practices.

Analysis of effect of practice growth

Between 2013 and 2018, the registered population size had grown (by >2,000 patients and >20%) in 644 practices and had stayed about the same (within 20% inclusive of the 2013 level) in 5,106. The remaining 1,339 practices had either fallen in size by >20% (55 practices), had a 2013 population of $\leq 3,000$ patients (924 practices), or had grown by $\leq 2,000$ patients (788 practices) (the numbers do not add up to 1,339 because many practices fell into more than one category).

The characteristics of the practices that had grown over 2013-2018 and those that stayed about the same size are shown in Table 1. Practices that had grown had fewer older people, more young children and more patients with long standing illnesses, and were more socioeconomically deprived, but no differences were large (although they were statistically significant). Practices that had grown were, however, much less likely to be rural and much more likely to be in London and the South.

Practices that had grown had larger falls in percentage change in positive GP Practice Survey responses than practices that had stayed about the same size (Table 2). While the differences were small, they were all statistically significant and were only marginally changed by adjusting for the possible confounding variables. The only difference that was greater than 5%, however, was for being able to see a preferred GP.

Analysis of the effect of working in collaboration

We had data on working in collaboration in early 2018 and GP Patient Survey 2017 for 6,673/7,089 (94%) practices: 206 were working in close collaboration, 3,666 in loose collaboration and 2,801 were not working in collaboration.

In practices working in close collaboration, patients were about 12 percentage points less likely to report being able to see their preferred GP than patients in practices not working in collaboration (45% versus 57%), but this difference was reduced to less than four percentage points after controlling for covariates, with the equivalent percentage of positive responses in 2013 having a particularly strong effect. The differences for access and overall experience were only around one percentage point worse in practices working in collaboration compared with those not working in collaboration.

Discussion

Summary

This study suggests that practices that had grown in size from 2013 to 2018 had no more improvement or deterioration in access or overall experience to an important degree than practices that had stayed about the same size. Practices that had grown did have a greater fall in patients' reports of being able to see a preferred GP than those that had not, by between four and nine per cent. Patients in practices that were working closely in collaboration in 2018 had worse measures of patient overall experience, access and continuity than those that were not, but this was largely explained by differences in demographics, geography and historical patterns of patient experience. In conclusion, we found some evidence that increasing practice size may have a negative effect on continuity of care but has no important effect on access. The evidence about the effects of working in close collaboration was much more limited and did not suggest any important effects on patient experience.

Strengths and limitations

This is the first study, as far as we are aware, that has attempted to assess the effect of change in practice size and working in collaboration on access and continuity of care. The datasets we used had very few missing data. We are confident that we have identified a group of practices working closely in collaboration.¹⁵

Whether the association between worse continuity of care and practice growth is causal is unclear. Practices may seek to grow because they are poorly performing in some way and have poor GP Patient Survey performance, and it may be that any positive effects of practice growth on patient experience are slow to be realised. It is possible that the differences we found may be due to residual confounding by unknown factors that are associated both practice growth and change in responses to the GP Patient Survey.

We measured access to care using three questions from the GP Patient Survey examining three different elements of access: getting through on the phone, getting an appointment, and being satisfied with opening hours. Access to primary care is a complex construct, however, and is not easily defined or measured⁴⁴; it is possible that these questions do not comprehensively measure the experience of access for patients.

We measured continuity of care using a single question from the General Practice Patient Survey, which is used to measure relationship continuity of care with a single GP. While this has been associated with positive effects on mortality, quality of life and hospital admissions,^{22,23,25,45} it reflects only perceptions of continuity with a single GP. It may be that satisfactory continuity of care that maximises the benefits for individual patients may be achieved by providing team-based care, either including other GPs, or other health professionals. Moreover, relationship continuity of care is only part of the concept of continuity. It may be that seeing several different health professionals affords the same benefits as seeing a single GP if information continuity i.e. record-sharing and handover is good. Other measures of continuity of care that encompass a broader view of continuity of care have been developed,^{46,47} but these are likely to be too long to be incorporated into a routine survey of hundreds of thousands of people without compromising the

response rate. It is also possible that some patients are willing to sacrifice continuity of care in order to achieve better access; some groups of patients value continuity of care more than others.⁴⁸

Comparison with existing literature

An analysis of the effect of an earlier initiative between 2008 and 2015 to fund practices to extend their opening hours found that there were small positive effects on access and overall experience, but the researchers did not report effects on continuity of care.⁴⁹ A recent systematic review examining the implications of large general practice collaborations in England found no quantitative studies of its effects on patient experience, and evidence from a single qualitative case study suggesting detrimental effects on continuity of care.³ A systematic review in 2013 found that smaller practices achieved better patient-reported access to services and better continuity of care,⁴ and a 2014 study by the Institute for Fiscal Studies found that larger GP practices had lower patient experience scores (although not specifically continuity of care).⁵ North American studies suggest that small practices may deliver better patient experience more cheaply and have fewer hospital admissions.⁵⁰⁻⁵³

Conclusion and implications

Larger general practice size in England may be associated with slightly poorer continuity of care and may not improve patient access. This supports the opinions of experts, who have warned that continuity of care will be a likely casualty of increasing access to general practice and growing practice size.²⁷ We acknowledge that it is early to evaluate the impact of initiatives implemented only in the last few years, and other influences may have also had an impact on patient experience (for example, part-time primary care staff working, changes in skill mix in general practice, lower public spending), but our study provides no support for the view that larger practice size or close collaborative working improves access. Negative effects on continuity of care are important because the high value placed on this element of general practice by patients, but also the evidence that it is associated with better health outcomes.⁴⁸ Continuity of care is particularly important in the care for people with long term conditions,⁵⁴ who are a key priority in English health policy.⁵⁵

We recommend better routine data collection about models of collaborative working and practice growth; it may be that data improve with the formation of primary care networks. It is also important that we monitor the effects of organisational change in terms of the patient experience – although effects on health, costs, safety, workforce, and evidence-based care are also important. Our study also suggests that we should consider new ways of monitoring continuity of care for routine data collection, recognising that it encompasses more than the face-to-face relationship between two individuals. We hope that primary care networks prioritise the recommendation of the GP Partnership Review that they ‘operate in a way that.....enables partners... to support continuity of high quality personalised holistic care.’⁵⁶

Additional information

Funding: NIHR Policy Research unit in Health and Social Care Systems and Commissioning

Ethical approval: Not applicable. We used routinely available data aggregated at the practice level and in the public domain.

Disclaimer: This research was funded by the National Institute for Health Research Policy Research Programme, conducted through the Policy Research Unit in Health and Social Care Systems and Commissioning. The views expressed are those of the authors and not necessarily those of the NIHR or the Department of Health and Social Care.

Contributions: LF led the design of the study and drafted the paper. HF and LF collected the data about practices working in collaboration and analysed the data. All authors contributed to the development of the ideas for the study and contributed to and approved the final manuscript. LF is guarantor.

LF affirms that the manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned have been explained.

[Competing interest statement](#) - All authors have completed the [Unified Competing Interest form](#) and declare: no support from any organisation for the submitted work, no financial relationships with any organisations that might have an interest in the submitted work in the previous three years, no other relationships or activities that could appear to have influenced the submitted work.

This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial.

Data sharing: data will be made available upon request.

References

1. NHS Digital. General and Personal Medical Services, England; Final 31 December 2017 and provisional 31 March 2018, experimental statistics. 2018. <https://digital.nhs.uk/data-and-information/publications/statistical/general-and-personal-medical-services/final-31-december-2017-and-provisional-31-march-2018-experimental-statistics> (accessed 2nd May 2020).
2. NHS England. General Practice Forward View. Leeds: NHS England; 2016.
3. Pettigrew LM, Kumpunen S, Mays N, Rosen R, Posaner R. The impact of new forms of large-scale general practice provider collaborations on England's NHS: a systematic review. *Br J Gen Pract* 2018; **68**: e168-e77.
4. Ng CWL, Ng KP. Does practice size matter? Review of effects on quality of care in primary care. *Br J Gen Pract* 2013; **63**(614): e604-e10.
5. Kelly E, Stoye G. Does GP Practice Size Matter? GP Practice Size and the Quality of Primary Care. London: Institute for Fiscal Studies, 2014.
6. NHS England. A guide to mergers for general practice. England South West: NHS England; 2016.
7. NHS England. A guide to networks and federations for general practice. England South West: NHS England; 2016.
8. Baird B, Reeve H, Ross S, et al. Innovative models of general practice. London: King's Fund, 2018.
9. Baird B, Charles A, Honeyman M, Maguire D, Das P. Understanding pressures in general practice. London: King's Fund; 2016.
10. NHS Digital. Patient registered at GP Practices in England: Special Topic Number of closed practices (<https://app.powerbi.com/view?r=eyJrjoiMjI1OWYxMzItNjMxYy00MWEOLG0Y2YtNWUyYTE3NWUzYmY2liwidCI6IjUwZjYwNzFmLWJiZmUtNDAxYS04ODAzLTY3Mzc0OGU2MjllMiIsImMiOjh9>). 2019 (accessed 13th November 2019).
11. Thomas R. Analysis: England's changing GP landscape. *Health Service Journal*. April 2017.
12. Kumpunen S, Curry N, Farnworth MJ, Rosen R. Collaboration in general practice. Surveys of GP practices and clinical commissioning groups. London: Nuffield Trust, Royal College of General Practitioners, 2017.
13. Rosen R, Kumpunen S, Curry N, Davies A, Pettigrew L, Kossarova L. Is bigger better? Lessons for large scale general practice. London: Nuffield Trust, 2016.
14. Kumpunen S, Rosen R, Kossarova L, Sherlaw-Johnson C. Primary Care Home - Evaluating a new model of primary care. London: Nuffield Trust, 2017.
15. Forbes LJ, Forbes H, Sutton M, Checkland K, Peckham S. How widespread is working at scale in English general practice? An observational study. *Br J Gen Pract* 2019; **69**(687): e682-e8.
16. NHS England, British Medical Association. Investment and evolution: A five-year framework for GP contract reform to implement The NHS Long Term Plan. Leeds: NHS England, 2019.

17. NHS England and NHS Improvement. NHS Operational Planning and Contracting Guidance 2019/20. Leeds: NHS, 2019.
18. Fisher R, Thorbly R, Alderwick H. Understanding Primary Care Networks. London: The Health Foundation, 2019.
19. Freeman G, Hughes J. Continuity of care and the patient experience. London: King's Fund, 2010.
20. Levesque JF, Haggerty JL, Burge F, et al. Canadian Experts' Views on the Importance of Attributes within Professional and Community-Oriented Primary Healthcare Models. *Health Policy* 2011; **7**(Spec Issue): 21-30.
21. RCGP Continuity of Care Toolkit Group. RCGP Continuity of Care Toolkit. London: Royal College of General Practice, 2019.
22. Pereira Gray DJ, Sidaway-Lee K, White E, Thorne A, Evans PH. Continuity of care with doctors—a matter of life and death? A systematic review of continuity of care and mortality. *BMJ Open* 2018; **8**(6): e021161.
23. Barker I, Steventon A, Deeny SR. Association between continuity of care in general practice and hospital admissions for ambulatory care sensitive conditions: cross sectional study of routinely collected, person level data. *BMJ* 2017; **356**: j84.
24. van den Berg MJ, van Loenen T, Westert GP. Accessible and continuous primary care may help reduce rates of emergency department use. An international survey in 34 countries. *Fam Pract* 2015; **33**(1): 42-50.
25. Chen HM, Tu YH, Chen CM. Effect of Continuity of Care on Quality of Life in Older Adults With Chronic Diseases: A Meta-Analysis. *Clin Nurs Res* 2017; **26**(3): 266-84.
26. Levene LS, Baker R, Walker N, Williams C, Wilson A, Bankart J. Predicting declines in perceived relationship continuity using practice deprivation scores: a longitudinal study in primary care. *Br J Gen Pract* 2018; **68**(671): e420-e6.
27. House of Commons Health Committee. Primary Care Inquiry 4th Report of Session 2014-15. London: House of Commons, 2016.
28. NHS England. [Archived Content] Numbers of Patients Registered at a GP Practice - April 2013. April 2013 2013. <https://data.england.nhs.uk/dataset/numbers-of-patients-registered-at-a-gp-practice-april-2013/resource/3fbb1295-9eaa-4786-85fd-00954bac4463> (accessed 9 September 2019).
29. NHS Digital. Patients registered at a GP practice. 2018. <https://digital.nhs.uk/data-and-information/publications/statistical/patients-registered-at-a-gp-practice/march-2018#resources> (accessed 27th August 2019).
30. Universities UK. Patterns and trends in UK higher education. London: Universities UK, 2018.
31. NHS England. NHS England Standard General Medical Services Contract 2017/18. Leeds: NHS England; 2017/18.
32. NHS England. NHS England Standard Personal Medical Services Agreement 2017/18. Leeds: NHS England; 2017/18.

33. NHS England. GP Patient Survey 2017 Practice Data (weighted) PUBLIC. 2017 (accessed 5th July 2018).
34. Ipsos MORI, NHS England. GP Patient Survey National results and trends. 2017 survey. London: NHS England, 2017.
35. Ipsos MORI, NHS England. GP Patient Survey Technical Annex 2017 Annual Report. London: Ipsos MORI, 2017.
36. Ipsos MORI. GP Patient Survey Practice 2013 by practice (weighted) (<https://www.gp-patient.co.uk/surveysandreports-10-16>). 2014 (accessed September 9th 2019).
37. NHS Digital. Patients Registered at a GP Practice - LSOA (<https://digital.nhs.uk/data-and-information/publications/statistical/patients-registered-at-a-gp-practice/april-2015>). 2015 (accessed 15th July 2019).
38. Ministry of Housing Communities and Local Development. English Indices of Deprivation 2015 (<https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015>). 2015 (accessed 15th July 2019).
39. Paddison CA, Saunders CL, Abel GA, Payne RA, Campbell JL, Roland M. Why do patients with multimorbidity in England report worse experiences in primary care? Evidence from the General Practice Patient Survey. *BMJ Open* 2015; **5**(3): e006172.
40. Kontopantelis E, Roland M, Reeves D. Patient experience of access to primary care: identification of predictors in a national patient survey. *BMC Fam Pract* 2010; **11**(1): 61.
41. Paddison CA, Abel GA, Roland MO, Elliott MN, Lyratzopoulos G, Campbell JL. Drivers of overall satisfaction with primary care: evidence from the English General Practice Patient Survey. *Health Expect* 2015; **18**(5): 1081-92.
42. Paddison C, Elliott M, Parker R, et al. Should measures of patient experience in primary care be adjusted for case mix? Evidence from the English General Practice Patient Survey. *BMJ Qual Saf* 2012; **21**(8): 634-40.
43. Lyratzopoulos G, Elliott M, Barbiere JM, et al. Understanding ethnic and other socio-demographic differences in patient experience of primary care: evidence from the English General Practice Patient Survey. *BMJ Qual Saf* 2012; **21**(1): 21-9.
44. Boyle S, Appleby J, Harrison A. A rapid view of access to care. London: The King's Fund, 2010.
45. Tammes P, Purdy S, Salisbury C, MacKichan F, Lasserson D, Morris RW. Continuity of Primary Care and Emergency Hospital Admissions Among Older Patients in England. *Ann Fam Med* 2017; **15**(6): 515-22.
46. Tousignant P, Diop M, Fournier M, et al. Validation of 2 new measures of continuity of care based on year-to-year follow-up with known providers of health care. *Ann Fam Med* 2014; **12**(6): 559-67.
47. Haggerty JL, Roberge D, Freeman GK, Beaulieu C, Breton M. Validation of a generic measure of continuity of care: when patients encounter several clinicians. *Ann Fam Med* 2012; **10**(5): 443-51.
48. Palmer W, Hemmings N, Rosen R, Keeble E, Williams S, Imison C. Improving access and continuity in general practice: Practical and policy lessons. . London: Nuffield Trust, 2018.

49. Cowling TE, Harris M, Majeed A. Extended opening hours and patient experience of general practice in England: multilevel regression analysis of a national patient survey. *BMJ Qual Saf* 2017; **26**(5): 360-71.
50. Casalino LP, Pesko MF, Ryan AM, et al. Small Primary Care Physician Practices Have Low Rates Of Preventable Hospital Admissions. *Health Aff* 2014; **33**(9): 1680-8.
51. Robinson JC, Miller K. Total expenditures per patient in hospital-owned and physician-owned physician organizations in California. *JAMA* 2014; **312**(16): 1663-9.
52. McWilliams J, Chernew ME, Zaslavsky AM, Hamed P, Landon BE. Delivery system integration and health care spending and quality for medicare beneficiaries. *JAMA Intern* 2013; **173**(15): 1447-56.
53. Willis TA, West R, Rushforth B, et al. Variations in achievement of evidence-based, high-impact quality indicators in general practice: An observational study. *PloS One* 2017; **12**(7): e0177949-e.
54. Aboulghate A, Abel G, Elliott MN, et al. Do English patients want continuity of care, and do they receive it? *Br J Gen Pract* 2012; **62**(601): e567-75.
55. NHS England, Care Quality Commission, Public Health England, Health Education England, NHS Improvement. NHS Five Year Forward View. London: NHS England 2014.
56. Watson N. GP Partnership Review. London: Department of Health and Social Care, 2019.

Figure 1. Mean percentages giving positive responses to GP Patient Survey questions in 2013 and 2017, according to size of registered population in March 2018

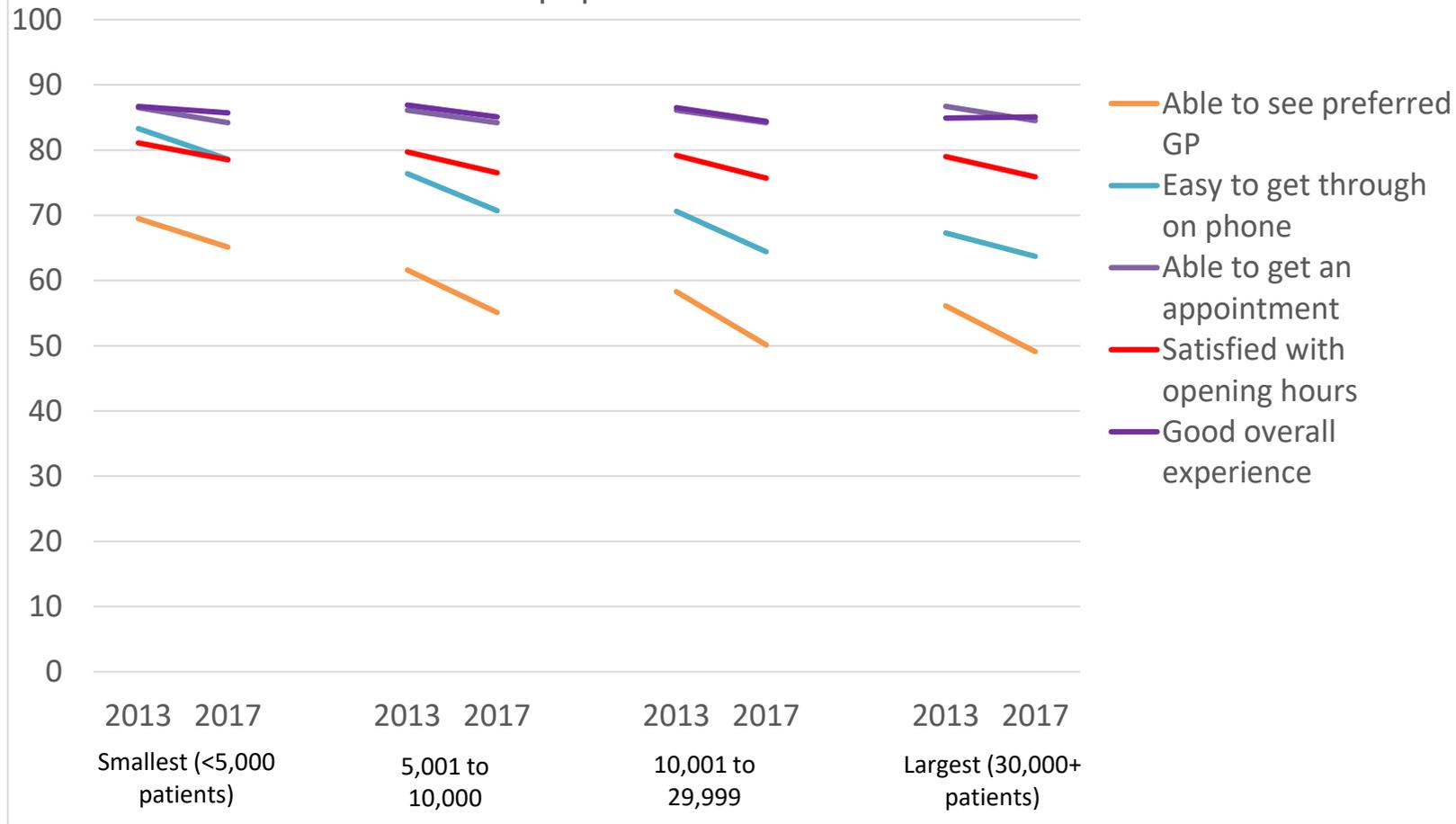


Table 1. Characteristics of practices according to change size of registered population between 2013 and 2018 (practices with more than 3000 patients in 2013)

		About the same size: Practices where registered population 2018 was within 20% of 2013 (n=5,106)	Grown: Practices where registered population increased by >20% and >2000 patients 2013 to 2018 (n=644)	<i>p</i> value for difference
Mean list size	2013	8,322	8,722	
	2018	8,627	14,087	
	Mean increase in list size 2013-2018 (%)	3.8	69.6	
Aged 75+ (%)	2013	7.9	6.3	<0.001
	2018	8.3	6.3	<0.001
Aged <5 (%)	2013	6.0	6.5	<0.001
	2018	5.5	6.0	<0.001
Male (%)	2013	49.7	49.7	0.30
	2018	49.9	50.1	0.89
Long standing illness (%)	2013	53.8	51.5	<0.001
	2018	54.1	51.1	<0.001
Index of Multiple Deprivation 2015		22.2	24.6	<0.001
Rural (%)		16.8	7.3	<0.001
Region (%)	London and South	39.1	53.9	<0.001
	Midlands	30.5	24.8	
	North	30.5	21.3	

Table 2. Positive responses to GP Patient Survey questions by whether practices had grown in size or not (practices with >3000 patients in 2013)

		About the same size: Practices where registered population 2018 was within 20% of 2013 (n=5,106)	Grown: Practices where registered population increased by >20% and >2000 patients 2013 to 2018 (n=644)	Adjusted difference in % change 2013-2017*
Able to see preferred GP*	2013	62.5	59.3	
	2017	55.6	48.9	
	% change 2013-2017 [†]	-9.2	-14.2	-6.6 (-8.9 to -4.3)
Easy to get through on phone	2013	75.7	77.2	
	2017	69.7	69.1	
	% change 2013-2017 [†]	-7.3	-12.2	-4.3 (-5.9 to -2.6)
Able to get an appointment	2013	86.2	85.5	
	2017	84.6	82.6	
	% change 2013-2017 [†]	-1.6	-3.1	-1.5 (-2.2 to -0.8)
Satisfied with opening hours	2013	79.7	81.0	
	2017	76.3	76.7	
	% change 2013-2017 [†]	-3.9	-4.7	-0.9 (-1.8 to -0.1)
Good overall experience	2013	86.9	86.8	
	2017	85.2	83.1	
	% change 2013-2017 [†]	-1.5	-3.9	-2.2 (-3.0 to -1.4)

*Controlling for % aged 75+ in 2018, % aged <5 in 2018, % long-standing illness in 2017, mean Index of Multiple Deprivation 2015, region (North, Midlands, London and south), urban/rural setting

[†]% change is calculated as percentage point change from 2013-2017 divided by percentage in 2013

Table 3. Positive responses to GP Patient Survey questions according to closeness of collaborative working

	Not collaborating (n=2,801)	Loosely collaborating (n=3,666)	Closely collaborating (n=206)	Adjusted difference in % between practices closely collaborating and not collaborating % (95% CI)	
	%	%	%	Model 1*	Model 2 [†]
Able to see preferred GP	57.0	56.3	45.1	-8.7 (-11.3 to -6.1)	-3.6 (-5.6 to -1.6)
Easy to get through on phone	71.6	71.5	64.8	-3.1 (-5.6 to -0.6)	-0.9 (-2.7 to 0.8)
Able to get an appointment	85.0	84.3	81.2	-0.5 (-1.5 to 0.5)	-0.5 (-1.5 to 0.5)
Satisfied with opening hours	77.0	77.0	75.5	-0.5 (-1.8 to 0.8)	-0.6 (-1.7 to 0.5)
Good overall experience	85.6	85.3	81.0	-1.9 (-3.2 to -0.6)	-1.3 (-2.4 to -0.2)

CI = confidence interval

*Model 1 includes % aged 75+ in 2018, % aged <5 in 2018, % long-standing illness in 2017, mean Index of Multiple Deprivation, region (North, Midlands, London and south), urban/rural setting

[†]Model 2 includes all model 1 variables plus the equivalent % in the GP Patient Survey 2013