

BMJ Open The changing shape of English general practice: a retrospective longitudinal study using national datasets describing trends in organisational structure, workforce and recorded appointments

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To cite: Pettigrew LM, Petersen I, Mays N, *et al.* The changing shape of English general practice: a retrospective longitudinal study using national datasets describing trends in organisational structure, workforce and recorded appointments. *BMJ Open* 2024;**14**:e081535. doi:10.1136/bmjopen-2023-081535

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (<https://doi.org/10.1136/bmjopen-2023-081535>).

Received 30 October 2023
Accepted 17 June 2024



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ABSTRACT

Objective To describe trends in the organisational structure, workforce and recorded appointments by role in English general practice.

Design Retrospective longitudinal study.

Setting English general practice.

Data sources and participants NHS England, Office for Health Improvement and Disparities and Care Quality Commission national administrative datasets covering between 5 to 10 years from 2013 to 2023.

Results Between 2013 and 2023, the number of general practices fell by 20% from 8044 to 6419; the average practice list size increase by 40% from 6967 to 9724 patients. The total population covered by providers with over 100 000 registered patients reached 2.3 million in 2023 compared to 0.5 million in 2017. The proportion of practices under individual ownership decreased from 13% to 11% between 2018 and 2023; there was little change in the proportion owned by partnerships, incorporated companies or NHS bodies, which respectively averaged around 80.3%, 6.9% and 0.7%. Between 2015 and 2022, there was a 20% rise in the total full-time equivalent (FTE) general practice workforce, including Primary Care Network staff, from 1.97 to 2.37 per 1000 patients because of an increase in multidisciplinary other 'Direct Patient Care' (DPC) and administrative roles. The number of nurses remained stable, and the number of qualified general practitioners (GPs) decreased by 15%. In September 2022, there were 0.45 FTE qualified GPs per 1000 patients; GPs and other DPC roles, excluding nurses, each represented 19% of the FTE per 1000 patients workforce; administrative roles represented 51%. The general practice workforce is predominantly female. A quarter of GPs qualified overseas. Between 2018 and 2023, there was no clear upward or downward trend in total appointments per 1000 patients with, on average, half provided by GPs.

Conclusions Since 2013, there has been a shift in general practice towards larger practices with more multidisciplinary teams, alongside a reduction in the number of FTE qualified GPs per 1000 patients. We recommend that the impacts of these changes on access, quality and costs are closely monitored.

BACKGROUND

National Health Service (NHS) general practices have traditionally operated as publicly

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This study provides an up-to-date analysis of national trends in English general practice's organisational structure, workforce and recorded appointments reported by role over the past 5 to 10 years drawn from a number of sources that are not normally well integrated.
- ⇒ It provides temporal trends of the general practice workforce and appointment activity relative to population size.
- ⇒ There are limitations to the estimations of the Primary Care Network workforce in general practice, and general practice appointment data are still considered 'experimental' by NHS England.
- ⇒ Further work is needed to understand the relationship between growing organisational size, broader multidisciplinary teams and falling GP numbers, and the impact of these changes on access, quality of care and costs of services.
- ⇒ Data on demand for general practice appointments and non-appointment-related activity, merged NHS England and Care Quality Commission time-series datasets, alongside indices of deprivation with performance and practice income data, would enable further research to understand the impact of trends.

funded, but independently contracted partnerships, mainly with general practitioners (GPs) as the partners. However, over the past decade, questions have started to be asked about whether the partnership model is still fit for purpose.^{1,2} 'Large-scale' general practice organisations have emerged, such as GP federations and multisite providers, with some operating through limited companies.³⁻⁵ General practices that have become part of NHS Trusts have also generated interest among policymakers.⁶ In parallel, national policy in England has encouraged integration of health and care organisations.

In 2019, all general practices were incentivised to form 'Primary Care Networks' (PCNs), resulting in around 1200 PCNs in England, typically covering populations of 30 000–50 000.⁷ In 2022, 42 Integrated Care Systems (ICSs) became statutory bodies to work with PCNs and other local health and care organisations to plan and deliver coordinated services.⁸

The general practice workforce has also been moving away from the traditional model of GP partners working with a practice nurse. There has been an expansion of employed ('salaried') GPs and the introduction of national programmes promoting the recruitment of pharmacists and multidisciplinary other 'Direct Patient Care' (DPC) roles into general practice, notably through the 'Additional Roles Reimbursement Scheme,' which, from 2019, provided financial incentives via PCNs to employ additional DPC roles.^{9 10} This has been happening in the context of an ageing and growing population with greater multimorbidity and levels of polypharmacy.¹¹

Despite a general awareness of these changes, it is hard to get an overall picture because information about different aspects of general practice is reported across multiple datasets. Consequently, news or organisational reports often provide limited statistical analysis of this information, and research studies often cover short periods or have a single domain of focus.^{3 12–22} Therefore, by combining information from different national data sources, we aim to describe the trends in the organisational structure, workforce and appointments recorded by role in English general practice over the past decade and consider the implication of these trends.

METHODS

We used national general practice databases that are regularly published by NHS England (previously NHS Digital), the Office for Health Improvement and Disparities (OHID) and the Care Quality Commission (CQC).^{23–28} The period covered by the datasets ranged from 5 to 10 years (online supplemental appendix: table 1), reflecting the data available from different sources when we undertook the analyses. We used Organisational Data Service (ODS) codes to define a practice and used these to merge various releases of datasets. NHS England, OHID and CQC were consulted where uncertainties arose about the data. Full methodological guidance on the datasets can be found on their websites.^{23–29} We report findings using RECORD guidance.³⁰

Population and practice metrics

The number of practices and their registered list sizes were identified using NHS England's 'Patients Registered at a GP Practice' datasets.²³ The proportion of patients aged over 65 years was obtained from OHID data (April 2023 data were taken from NHS England as OHID had not yet published theirs).^{23 24} Data from April 2013 to April 2023 were used to produce a time series using figures released

every April. All practices with the variables of interest in these datasets were included (>99%).

Organisational structure

We used the CQC's archive of 'HSCA Active Locations' every April between 2017 and 2023 as the source of the practice site ('Location ID') and the provider ('Provider ID') that owned the practice, to identify providers with more than one practice site ('multisite providers').²⁵ The CQC's classification of ownership type, available from 2018, used the following four categories: 'Partnership', 'Individual' (ie, single-handed ownership), 'Organisation' (ie, incorporated limited or community interest company) or 'NHS body' (ie, NHS Trust). The identification of multisite providers was only possible from 2017 due to the way in which active practice locations had been archived by the CQC. The CQC also identified clusters of providers operated under an overarching 'Brand'. We labelled providers, or the overarching 'Brand' where it existed, with a total list size exceeding 1 00,000 patients as 'mega-providers'. We merged CQC and list size datasets to calculate a mega-providers' list size. For an average of 7% of mega-providers' associated practices, a corresponding list size could not be matched, resulting in a probable underestimation of some of their total list sizes. Between 9 and 87 practice ODS codes were found to be used across two CQC practice 'locations', depending on the year; therefore, their merged list sizes were adjusted to avoid double-counting when calculating the 'mega-provider' list size.

Workforce

Workforce information was obtained from the revised NHS England 'General Practice Workforce' datasets every September between 2015 and 2022. General practice workforce categories cover GPs, nurses, other DPC roles (eg, pharmacists, social prescribers, physician associates, paramedics)³¹ and administrators.

We use the label 'qualified GPs' to mean GP partners, salaried GPs, GP locums and GP retainers (GPs re-entering the workforce after a period out-of-practice). We use the label 'GP trainees' to include GP trainees (ST1-4) but to exclude Foundation Years (FY1-2) doctors. Practice-level GP trainee figures were only available for time-series analysis from 2018 due to changes in data collection methods.^{26 32} Locum figures exclude ad hoc locums that only work briefly to cover short-term or unexpected absences.

We grouped GPs' country of qualification into three categories: UK, high-income country region, low- or middle-income country region. We use 'female', 'male' and 'other/unknown' to classify gender as per the original dataset. We grouped workforce roles by age (<35, 35–49, 50–64 and 65+ years).

Individual staff data aggregated by NHS England at the national level, excluding estimated values where no value was reported by the practice, were used to calculate total national headcount (HC) and full-time equivalents

(FTE) by age, gender and GPs' country of qualification. National FTE/HC proportions were calculated by role to examine trends in FTE working hours. For GPs, these were also broken down by male and female gender. Practice-level workforce data were used to calculate FTEs per 1000 patient values and to report on the 10th to 90th percentiles. Per 1000 patient figures by gender and age were calculated by dividing each practice's workforce figures by its patient list size on the same date and then multiplying by 1000.

Practices with missing workforce data were automatically excluded from the denominator; this proportion varied by year and by role between 0.4% and 2.5%. Practices that had a list size of ≤ 1000 registered patients in September of the year of analysis were also excluded from FTE/1000 patients analyses because they were likely to be atypical (eg, closing or delivering care to a sub-segment of the population) and their workforce to population ratios would not be comparable. On average, 97% of practices were included in the practice-level workforce per 1000 patient analyses (online supplemental appendix: table 2).

As General Practice workforce figures exclude DPC and administrative roles contracted at PCN level who are likely working for practices, we estimated PCN FTE roles per 1000 patients by dividing the national FTE total of NHS England's 'PCN Workforce' figures (and then multiplying by 1000), each September between 2020 and 2022, with the total number of patients registered in England in the corresponding month from NHS England's 'Patients Registered at a GP Practice'.^{23 27} As not all PCNs submitted workforce figures during this period, this will have resulted in an underestimate of PCN workforce figures per 1000 patients. Further details are described in the limitations.

Appointments

NHS England's 'Appointments in General Practice' data were based on reported total national figures.²⁸ Appointments include face-to-face, telephone, video consultation/online appointments and home visits. Identifiable COVID-19 vaccination-related appointments are removed by NHS England.²⁹ We converted appointments to appointments/week/1000 patients using the total number of registered patients across all practices in the same dataset. We report on 5 years of data available between April 2018 and April 2023, with disaggregated nursing and DPC role appointments available from August 2021. While these are official statistics, NHS England still refers to them as 'experimental'.^{28 29} Further details are described in the limitations.

Analysis

Analysis was based on statistically testing and describing the patterns across the variables outlined above. The number of practices in the datasets from each source was similar but not always in agreement due to variation in collection dates and methods.

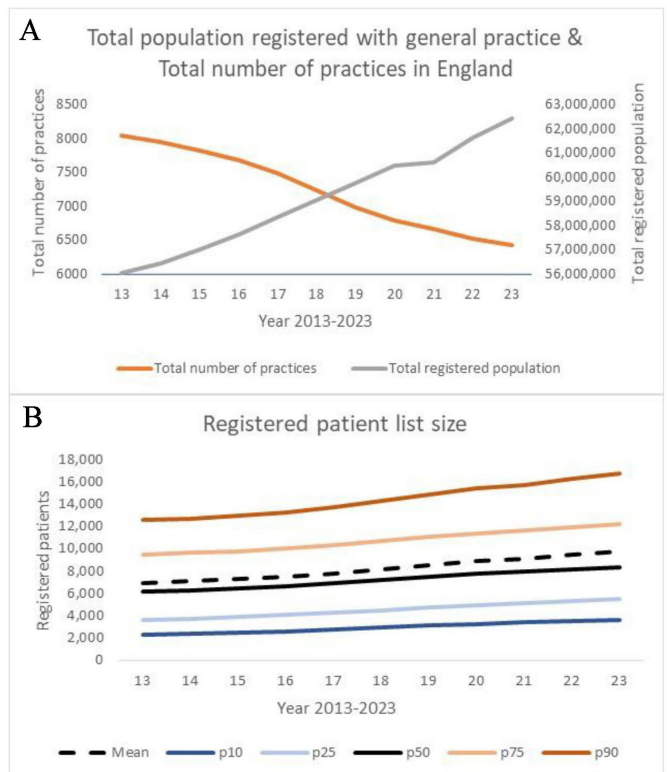


Figure 1 (A) Total number of general practices in England and total population registered with general practice; (B) Practice list size by registered patients. Every April 2013–2023.²³

Descriptive statistics are used to provide a summary of trends, with the mean and spread of the practice level values reported using 10th and 90th centiles. The absolute change per year coefficient or incidence rate ratio (IRR) providing the relative change for the full-time period, with 95% CIs, are reported for linear and Poisson regression analyses, respectively. STATA 17 and 18 were used for analysis and Excel for graphs.

Patient and public involvement statement

This paper is part of a wider research project examining the impact of inspections on the quality of general practice where there has been patient and public involvement in the design and undertaking of the study. Several drafts of this paper were reviewed by a patient with research expertise and who is a member of their general practice's 'Patient Participation Group'. Further details are in the acknowledgements.

RESULTS

Organisational structure

Population growth, practice numbers and list sizes

The total population registered with a general practice in England grew by 11% from 56 042 361 to 62 418 295 between April 2013 and April 2023 (640 816/year [95% CI 604,260 to 677 372]), with a temporary slow down in 2020/2021 during the COVID-19 pandemic (figure 1A).

Alongside this population growth, the mean proportion of patients aged 65 years and over increased from 16.3% to 17.9% (IRR 1.09 [95% CI 1.08 to 1.10]). The variation between practices across the time period saw a similar increase with 10th and 90th percentiles being 7.7% and 24.1% in April 2013 and 8.2% and 27.1% in April 2023.

Meanwhile, the total number of practices fell from 8044 in April 2013 to 6419 in April 2023, an average loss of 178 practices/year (95% CI -193 to -163). This represents a 20% reduction in the number of practices over ten years (figure 1A).²³ This is consistent with the total number of unique practice postcodes falling from 7163 to 5849, representing the loss of 18% unique locations by registered ODS code over this period. In contrast, 16% of practices still shared a postcode in 2023, a slight reduction from 19% in 2013.²³

Between April 2013 and April 2023, the mean practice list size increased by 40% from 6967 to 9724 patients (291/year [95% CI 279 to 303]). The spread of practice list size remained wide throughout this period with the 10th and 90th percentiles being 2329 and 12582 in April 2013 and 3617 and 16765 in April 2023 (figure 1B).²³

The number of practices with lists exceeding 20000 patients has risen noticeably; in 2013, these only represented 1% of practices (n=81) compared with 6% in 2023 (n=355) (IRR 5.5 [95% CI 4.3 to 7.0]). The largest practice list, by ODS code, doubled from 52386 to 106308 patients in this same period. Some of these large practices operate over various practice sites, although this is unclear in the NHS England datasets as they operate under a single ODS code.³³ Providers also exist that operate multiple practice sites under various ODS codes—'multisite providers'—their true organisational list size is therefore larger than that captured under individual ODS codes (see below).

Practice ownership, multisite providers and mega-providers

Ownership

CQC data on practice ownership were available between April 2018 and April 2023. During this period, the total number of practice sites registered with the CQC fell from 7441 to 6446 and their respective providers fell from 6769 to 5863. Practice sites owned by 'Individual' GPs (ie, single-handed ownership) fell in number from 975 to 724 (-51/year [95% CI -62 to -40]), which corresponds to a statistically significant change in the proportion of practices they represent from 13% to 11% (IRR 0.86 [95% CI 0.77 to 0.94]). In contrast, there was no clear trend in the proportion of 'Partnerships', 'Organisations' and 'NHS bodies' which, respectively, on average, represented 80.3%, 6.9% and 0.7% of practice sites and 83.6%, 3.3% and 0.3% of providers. The proportion of practice sites, which 'Organisations' and 'NHS bodies' owned, was over double the proportion of providers they represented as most are multisite providers (online supplemental appendix: figure 1A,B).²⁵

Twenty-six NHS bodies, mostly NHS Trusts, ran general practices between April 2018 and April 2023. Seventeen

remained active in 2023. The number of practice sites run by each NHS body across these years ranged between one and ten (mean=2.5). In April 2023, the largest NHS body GP provider ran eight practice sites (online supplemental appendix: figure 2).²⁵

Multisite and mega-providers

Between April 2017 and 2023, the proportion of multisite providers and their associated practices registered with the CQC remained stable, representing on average 4% of providers and 13% of practice sites.²⁵ Examining providers and 'Brands' with >100000 patients across all sites, that is, 'mega-providers', there were three in 2017 compared with 11 in 2023. Their estimated total registered population increased from 0.5 million to 2.3 million. The number of practices under these mega-providers ranged between one and 42 (mean=27). The largest mega-provider registered with the CQC in April 2023 covered an estimated 452097 patients (online supplemental appendix: figure 3). However, examining organisational websites, two 'mega-providers' registered separately under the CQC merged in 2021 with an estimated total population of 635979 over 56 practice in sites April 2023.³⁴

Workforce

General practice workforce

Figures on the general practice workforce from September 2015 to September 2022 were analysed, during which time the number of practices in the practice level datasets declined from 7623 to 6456.

General practitioners

Between September 2015 and September 2022, the total qualified GP headcount in England increased from 34474 to 36492. In contrast, the total qualified GP FTE fell from 27948 to 27321. The average number of qualified GP FTEs/1000 fell from 0.53 to 0.45, representing a 15% fall (IRR 0.86 [95% CI 0.84 to 0.87]). Similarly, the 10th and 90th percentiles fell from 0.32 and 0.73 FTE/1000 in 2015 to 0.24 and 0.66 FTE/1000 in 2022 (figure 2A(i)).

The fall in qualified FTE GPs/1000 mirrored a 26% drop in GP partners from 0.39 to 0.29 FTEs/1000 (IRR 0.70 [95% CI 0.69 to 0.72]). In contrast, there was a 25% rise in the average number of salaried GPs from 0.12 (p10-p90, 0-0.30) to 0.15 (p10-p90, 0-0.32) FTEs/1000 (IRR 1.31 [95% CI 1.27 to 1.35]). The proportion of FTE salaried GPs out of all qualified FTE GPs increased from 23% to 36%; as a HC proportion, it increased from 28% (n=9817) to 42% (n=15297). In 2015, 61% of practices reported employing salaried GPs; in 2022, this had increased to 74%.

The use of regular GP locums showed no clear trend. The proportion of practices reporting regular locum use averaged has around 17% since 2015, with a regular locum average annual mean of 0.019 FTE/1000 (p10-p90, 0-0.064). The number of GP retainers, although

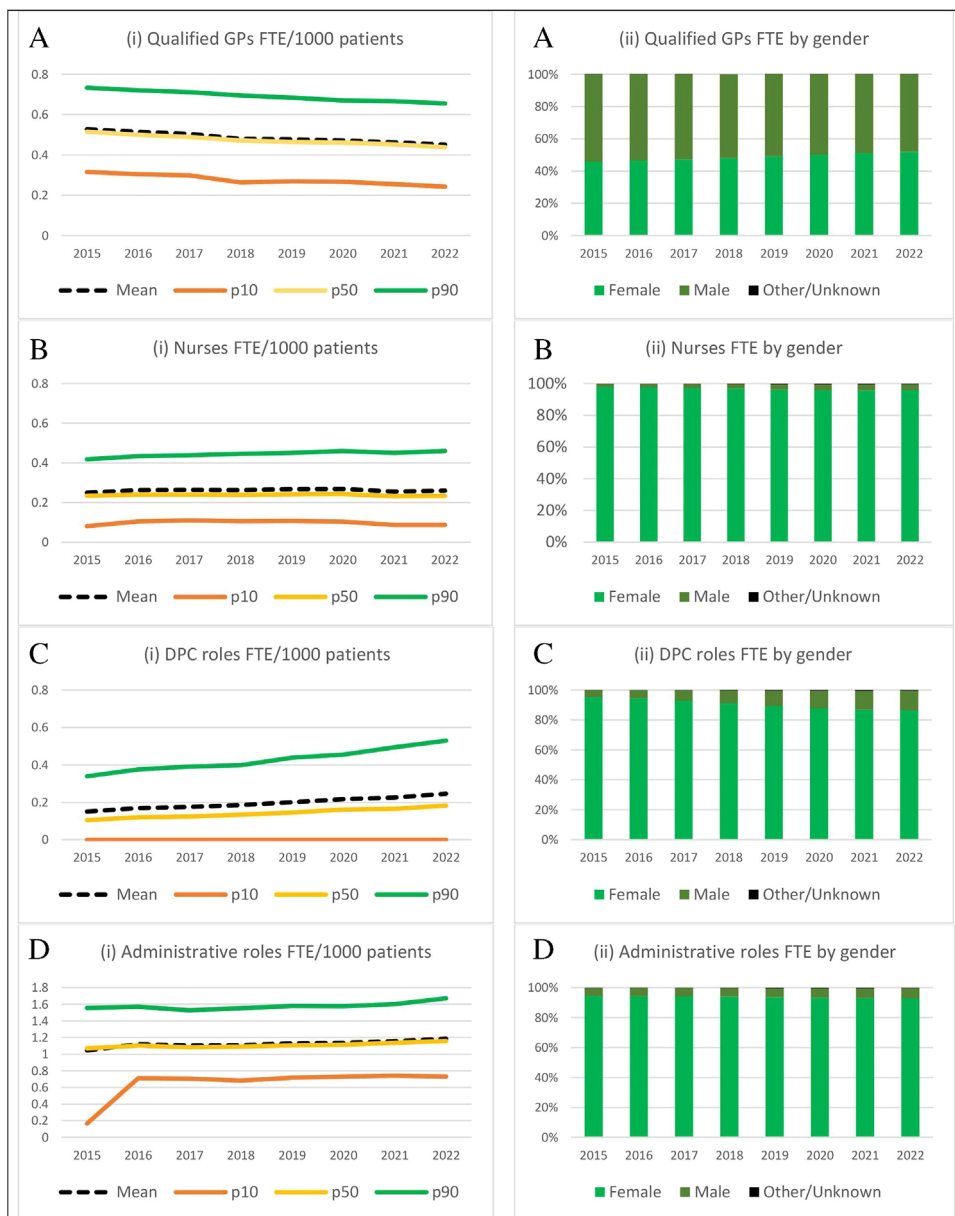


Figure 2 (A–D) (i) Full-time equivalent (FTE) per 1000 patients general practice workforce roles in England mean, p10, p50 and p90 (note different scale on Y-axis for administrative roles); (ii) Percentage of FTE general practice workforce roles by gender in England. Every September 2015–2022.²⁶

rising from a HC of 165 to 613, remained very small, representing 0.001 in 2015 and 0.004 FTEs/1000 in 2022 (IRR 3.12 [95%CI 2.4 to 4.1]). Between 2015 and 2022, the proportion of qualified GPs who had qualified in the UK remained around 73% (online supplemental appendix: figure 4). The mean number of GP trainees notably increased from 0.06 (p10–p90, 0–0.21) to 0.12 (p10–p90, 0–0.34) FTEs/1000 between 2018 and 2022 (IRR 1.75 [95%CI 1.68 to 1.81]). The proportion of practices reporting a GP trainee (ST1-4) increased from 35% to 50% during the same period.

As a proportion of all qualified GPs, between 2015 and 2022, the female/male HC ratio shifted from 52:48 to 57:43, and the FTE ratio shifted from 46:54 to 52:48 (figure 2A(ii)). The loss of qualified FTE GPs/1000

was steeper, at 23%, among male GPs from 0.30 to 0.23 FTEs/1000 (IRR 0.76 [95%CI 0.75 to 0.78]), compared with female GPs, at 4%, from 0.23 to 0.22 FTEs/1000 (IRR 0.97 [95%CI 0.95 to 0.99]). The age distribution of qualified GPs has remained relatively stable since 2015, with 35–49-year-olds representing on average 49% of the total (online supplemental appendix: figure 5A).

The percentage of total FTEs out of total HC fell for GP partners (89–86%) and salaried GPs (67–64%). The FTE/HC percentage for GP locums, retainers and trainees (since 2018) did not change significantly. Across all GP roles, females were more likely to report working fewer FTE hours than male GPs (online supplemental appendix: tables 3A,B).

Nurses and other direct patient-care roles

The mean number of FTE nurses remained relatively stable between 2015 and 2022 at around 0.26 FTEs/1000 (IRR 1.05 [95%CI 1.03 to 1.08]), with, on average, 97% of practices reporting employing a nurse. Across practices, there was typically a fourfold variation in nurses between the 10th and 90th percentile of practices, with values of 0.10 and 0.44 FTEs/1000 in 2022 (figure 2B(i)).

In comparison, the mean number of other DPC roles employed by practices increased from 0.15 (p10-p90, 0–0.34) to 0.25 (p10-p90, 0–0.53) FTEs/1000. This corresponds to an increase of 67% (IRR 1.67 [95%CI 1.63 to 1.71]) (figure 2C(i)). The proportion of practices that reported employing any DPC roles, excluding PCN staff, increased from 72% to 89% between 2015 and 2022.

The vast majority of staff in nursing (>96% annually) and DPC roles (>87% annually) were women (figure 2B(ii) and c(ii)). The nursing workforce was older than those in DPC roles (online supplemental appendix: figure 5B and C). The FTE/HC increased for nurses (65–69%), and DPC roles employed at the practice level (63–71%) (online supplemental appendix: table 3A).

Administrative roles

Administrative roles increased by 14% from a mean of 1.05 (p10-p90, 0.17–1.56) to 1.19 (p10-p90, 0.73–1.67) FTEs/1000 between 2015 and 2022 (IRR 1.16 [95%CI 1.14 to 1.17]) (figure 2D(i)). Within administrative roles, the mean number of managers remained around 0.19 (p10-p90, 0.06–0.34) FTEs/1000 (IRR 1.03 [95%CI 1.00 to 1.06]).

The vast majority of the administrative workforce were women (>93% annually; figure 2D(ii)), and the 50–64 age group made up the majority of the FTE administrative workforce, never falling below 43% annually (online supplemental appendix: figure 5D). The FTE/HC increased from 68% to 72% (online supplemental appendix: table 3A).

Combined general practice and PCN workforce

Using ‘Primary Care Network Workforce’ data, we estimated that since the inception of PCNs in 2019, there had been at least a further 0.21 DPC and 0.02 administrative FTE roles/1000 contracted via PCNs by September 2022²⁷ (figure 3).

The combined general practice and PCN workforce increased from 1.97 to 2.37 FTEs/1000 patients between 2015 and 2022 (0.047/year [95%CI 0.024 to 0.069]). This represents a 20% rise, or in other words, an increase from one member of staff per 508 patients to one per 422 patients. These combined figures suggest that FTEs/1000 DPC roles in 2022 represented around 19% of the general practice workforce, the same proportion as qualified FTE GPs. Nurses represented 11% and administrative roles 51%, the largest proportion.

Appointments

The number of practices reporting appointments in the total monthly ‘Appointments in General Practice’ dataset was 6385 in April 2018 and 6361 in April 2023, respectively, covering 89.9% and 99.9% of all registered patients in England.^{28 29} Using national-level data, we estimated that during this period there were between 63 and 119 (mean=98) appointments/week/1000 patients reported. Peaks were seen between September and November each year, and appointments dipped between April and August 2020. There was no clear overall upward or downward trend in total appointments/week/1000 patients during the 5 year time series.

GP appointments ranged from 35 to 57 (mean=49)/week/1000, with no clear trend over time, despite the fall in qualified GP FTEs/1000. Where reported, nurse appointments ranged between 18 and 28 (mean=22)/week/1000. DPC role appointments ranged between 17 and 26 (mean=21)/week/1000. DPC role appointments showed an upward trend from when first reported in August 2021 (0.24 more appointments/week/1000

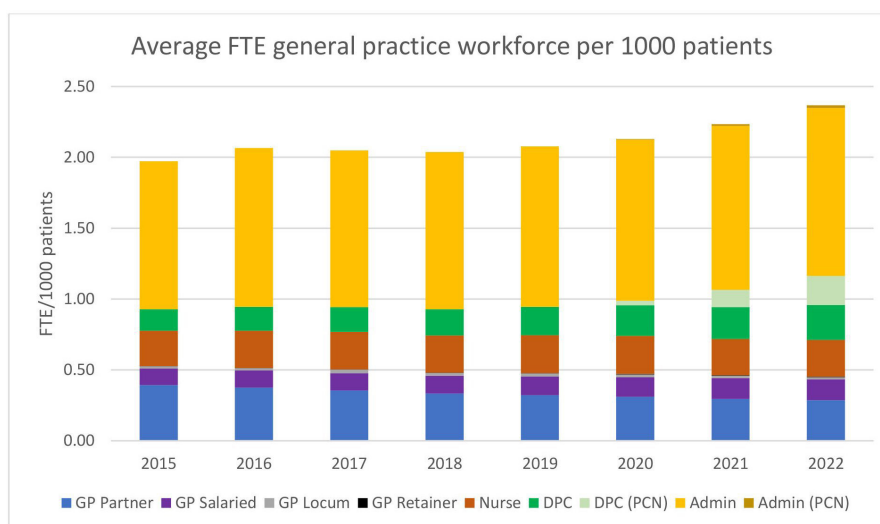


Figure 3 Average full-time equivalent general practice (excluding GP trainees) workforce per 1000 patients, including Primary Care Networks' other Direct Patient Care and administrative roles in England. Every September 2015–2022.^{26 27}

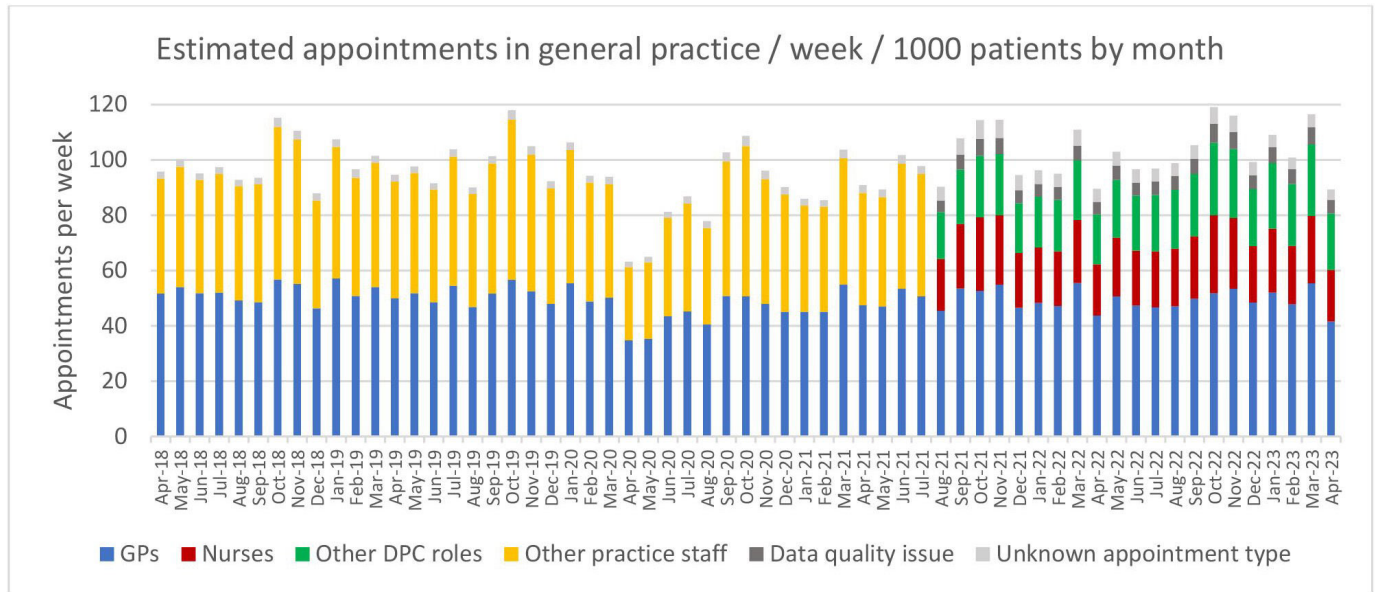


Figure 4 Average number of appointments by role per week per 1000 patients in England. Presented by month between April 2018 and April 2023.²⁸

[95%CI 0.10 to 0.39]). Between 3% and 11% (mean=5%) of appointments had data quality issues or the staff roles delivering appointments were unknown (figure 4). Limitations regarding appointment data are discussed further below.

DISCUSSION

Trends in the organisational structure, workforce and recorded appointments in English general practice show that in the last decade, within the context of a growing and ageing population, there has been a shift towards fewer but larger organisations and more multidisciplinary teams with fewer qualified FTE GPs per 1000 patients. Both qualified GPs and DPC roles, including the PCN workforce, represented 19% of the FTE workforce in general practice by September 2022. Despite this, GPs continued to provide around half of appointments with no clear upward or downward trend in the number of appointments per 1000 patients from April 2018 to April 2023. Operating a practice as a partnership continues to be the dominant model of ownership. The workforce is predominantly female, and there is a stable reliance on doctors who qualified outside the UK. Administrative roles make-up over half of the FTE general practice workforce.

The move towards larger-scale organisations has been encouraged by government policy and professional bodies to improve quality and generate economies of scale through shared back-office functions, joint service delivery and standardised processes.^{3 5 35} However, the evidence regarding whether larger organisations deliver better-quality primary care or are more cost-effective is mixed.^{4 36-41} The diversification of the general practice workforce has also been driven by national policy and proposed as a solution to GP shortages.^{14 42 43} While

broadening the multi-disciplinary team can provide additional expertise, concerns have been raised by GPs, researchers and the media about the burden of their additional training needs, the effect on relational continuity of care, its cost-effectiveness, equity in distribution of roles and the safety of using such roles without sufficient GP oversight.^{14 44-52}

Our analysis shows a reduction of 18% in unique practice postcodes in the past decade. It was not possible to determine whether practices that closed did so with list dispersion or merged with another local practice, and therefore, it was not possible to determine whether the loss of a unique postcode was due to the physical closure of a site or it becoming a 'branch' of another practice registered under an existing ODS code and postcode. Where there was a physical closure, this is likely to have affected equity of access due to the increasing distance to the practice for patients for whom travel is difficult. Practice closures have also been shown to have a negative effect on income and patient satisfaction in remaining local practices that absorb the population and that may struggle to meet patient needs.^{41 53 54} In contrast, 16% of practices still share a postcode. While this may enhance patient choice, it may also result in inefficiencies where practices operate in parallel.

While absolute numbers of practices under individual ownership are falling at a faster rate than other forms of general practice ownership, they still represent 11% of practices. Despite government and research interests in practices run by incorporated organisations and NHS bodies, these own a minority of practices.^{5 6} Notably, over one-third of NHS Trusts that have run practices over the past 5 years no longer do so. This may suggest that Trusts' involvement was intended to be transitional or they faced challenges to their ability to provide general practice which affected their wish to continue.⁶

To date practices, unlike hospitals, have been allowed to close when they were no longer financially viable or made to close where there were regulatory concerns.^{54 55} However, with increasing organisational size, including at least 13% of practices being part of a multisite provider based on their CQC registration and the expansion of 'mega-providers', mitigating the risks of general practice providers becoming 'too big to fail' merits regulatory consideration.

GP figures reported elsewhere often include trainees; are calculated by headcount, or as FTEs but without adjusting for population size; and, therefore, do not accurately reflect the active qualified workforce.^{19 21 26} Our analysis demonstrates a 15% reduction in FTE-qualified GPs/1000 since 2015, with 0.451522 FTE-qualified GPs/1000 in September 2022: in other words, one FTE GP per 2215 patients. This figure is close to recent ONS calculations, but well below the figure reported by the OECD for the UK (0.81/1000 patients—calculated by headcount and including trainees) which, if revised using our definition of qualified GPs, would place England in the quartile of OECD countries with the lowest number of GPs per population.^{21 56} While GP trainee figures are rising, this will result in a less-experienced workforce if qualified GPs continue to leave. There is also no guarantee that, once qualified, GP trainees will work full time in general practice (workforce data suggest the majority of trainees work full time in general practice, while qualified GPs do not) or remain in general practice.⁵⁷ This highlights the need to address factors which lead to GPs reducing or leaving clinical practice.^{58–61}

Doctors who qualified overseas represent around a quarter of GPs—mostly from low- or middle-income country regions. Their contribution, in particular to underserved populations, is well documented, but the challenges of doing so have often under-recognised and undervalued.^{62–65} Ongoing NHS reliance on doctors from overseas raises questions around ethical international recruitment.⁶⁶

Administrative roles in general practice receive little research and policy attention.^{67 68} As practices become larger and more complex and because of the importance of these roles for public facing and back-office functions, greater research and policy focus on the administration and management of general practice is an urgent priority.

The majority of the workforce is female. GP FTE/HC figures indicate that female GPs, on average, report working fewer FTE hours in general practice than males (online supplemental appendix: table 3B). Understanding the reasons for this, its implications for workforce planning and what policies would support the retention of this workforce is critical.⁶¹ It has implications to ensure parity of opportunities, income and working conditions for all genders.⁶⁹

Although other DPC roles and qualified GPs both represented around a fifth of the combined FTE general practice and PCN workforce by the end of the workforce time series in September 2022, appointments/1000

patients data suggested that GPs still provided around half of appointments, whereas DPC roles provided around a fifth. Contributory factors to this discrepancy could include issues with the data collection process, that DPC role appointments are longer and/or more of their time is spent on non-patient facing activity or at the PCN level, and, therefore, is not captured in general practice appointments.²⁷ Appointment data indicate annual peaks of activity around financially incentivised influenza vaccination season and a trough following the first COVID-19 lockdown. The provision of an estimated average of 98 appointments/week/1000 between 2018 and 2023 equates to 5.1 appointments/year/patient. This figure, although similar to values reported in 2014 and in 2022, is lower than the 2019 estimates and should be interpreted with caution.^{12 70 71} Our analysis does not suggest a trend of rising or falling total or GP appointment numbers relative to the population since April 2018. This is in contrast to figures recently reported elsewhere that do not take into account population growth, include COVID-19 vaccination activity and cover shorter periods and/or use smaller datasets.^{18 20 72 73} Falling GP numbers delivering the same number of appointments/1000 seems unsustainable; therefore, there is likely to be a tipping point in the near future where the majority of appointments in English general practice are no longer delivered by GPs. Maintaining relational continuity of care will be harder to achieve if there is a shortage of GP appointments and if patients need to see different clinicians for different problems, this will likely have implications for quality of care.^{74–76}

Trends point to a changing role for the GP partner from a self-managing owner of a small business to holding responsibility for the governance of a much larger organisation and its associated multidisciplinary team. This is happening against a background of decreasing numbers of GPs, where both partners and salaried GPs are reducing their FTE hours. This indicates the need to prioritise the retention of the existing GP workforce, as well as prepare GPs for a different model of practice. Reduced continuity of care, captured in the annual national general practice patient survey and lowest ever levels of public satisfaction with general practice, are a warning that this period of transition is proving challenging to patients, particularly within the context of a growing and ageing population, alongside post-COVID-19 pandemic and secondary-care pressures.^{76–81}

Limitations

NHS England's total registered population in general practice was 7% (over 4.4million people) higher than Office for National Statistics' (ONS) 2021 mid-year estimates.^{23 82} NHS England is aware of this discrepancy that appears to be increasing over time and attributes a range of factors to this, including delayed de-registrations and duplicate records.⁸³ This has implications when reporting values relative to the population size, particularly where patient turnover and, therefore, discrepancies between

NHS England and ONS population figures may be greater.

We confirmed with NHS England that general practice and PCN workforce datasets did not double count roles. However, not all PCNs contributed to national PCN workforce figures, with 50.3% responding in September 2020 and 87.5% in September 2022.⁸⁴ Also, a small proportion (<1%) of practices are not part of a PCN.⁷ Therefore, using national-registered patient numbers will have underestimated the PCN workforce/1000 patients, particularly for the initial years.

The requirement for practices to capture appointment data in a standardised format was only introduced in March 2021, and NHS England's appointment data are still deemed 'experimental' due to variation in working methods and recording between practices.^{29 85} COVID-19 resulted in atypical appointment provision during 2020/2021 when many practices limited face-to-face access and demand fell as many patients avoided health-care settings. Since August 2021, the recording of the role type delivering an appointment changed from that set by practice staff when creating the appointment to that captured through the smart card ID of the person delivering the appointment. Our estimated number of appointments per week, using monthly figures, do not account for the exact number of working days each month. These factors affect the interpretability of the appointment trends. Appointment data also do not capture other general practice work, such as managing correspondence, prescriptions, reviewing test results, staff supervision, management and quality improvement activity. In addition, digital encounters such as online consultations delivered through separate messaging software may not be captured, unless recorded as an appointment. Workforce FTE figures are unlikely to be capturing overtime, which is common in general practice.^{58 70 86 87}

Strengths and opportunities for future research and policy

This study provides an up-to-date analysis of national trends in English general practice's organisational structure, workforce and appointments recorded by role over the past decade. It provides a comprehensive overview of temporal trends in general practice workforce and reported appointments relative to the population size.

While the data used in this paper are openly available and interactive data dashboards are emerging,^{16 18 20–22 88} making access more user-friendly would facilitate the use of this data to inform policy and practice. In particular, NHS England ODS codes should better align with CQC location and provider data, and it should be easier to identify practices that have multiple sites but are operating under a single ODS code and/or CQC 'Location ID'. Datasets could also be merged at the practice level to include indices of deprivation and other practice-level performance data such as QOF scores and GP patient satisfaction survey responses alongside payments to general practice. The capture of data such as demand for appointments and workforce time spent on

non-appointment-related activities would also enhance understanding of how general practices are functioning.

Our analysis offers a benchmark for providers and commissioners as well as for international comparisons. However, further research to understand what represents warranted versus unwarranted variation is important as the provision of care should vary subject to the needs of local populations. The relationship between the trends reported here and access, quality of care or costs was beyond the scope of this paper. Other work in these areas are already underway, in particular, examining inequities in workforce distribution.^{13 14 21 50 51 53 71 89–91} However, opportunities exist for further research in this area to understand the wider impact of the changing shape of English general practice.

Conclusions

Over the past decade, the organisational structure and workforce of general practice in England has clearly shifted towards larger practices with extended multidisciplinary teams. We recommend that these changes, alongside the fall in the number of practices and FTE qualified GPs, are carefully monitored to assess their impact on access, quality of care and costs.

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Acknowledgements With thanks to Gill Wait who provided a patient's perspective to the study. With thanks to NHS England (previously NHS Digital), OHID (previously PHE) and CQC teams who responded to queries regarding the data. With particular thanks to Neil Wilcock, Senior Information Analyst, Workforce and Facilities Primary Care Workforce Team, Data & Analytics, NHS England; to Debs Elliott, Principal Information Analyst, Estates and Workforce Collections, Data and Analytics, NHS England; to Tasha Harrison, Principal Information Analyst and Haidar Ali, Information Analyst, Primary Care Domain, NHS England; and to Maciej Dobras, Senior Data Product Manager and Doris Hain, Principal Data Product Manager at Digital Innovation & Data Science, Office for Health Improvement and Disparities, Department of Health and Social Care. With thanks to Kieran Walshe and Martin Marshall for support and input to the wider PhD project which led to this paper. With thanks to the BMJ Open peer reviewers for their valuable contributions to improve this paper. CQC data is made available under the Open Government Licence.

Contributors All authors contributed to the planning, conduct and reporting of the study. LP undertook the analysis and drafting of the article. IP and DC provided technical expertise to enable the analysis of the data. IP, NM and DC provided feedback on various drafts of the article. LP is the guarantor of the study. LP attests that all listed authors meet the authorship criteria and that no other authors meeting the criteria have been omitted. PPI input and feedback from NHS England (NHS Digital before February 2023), OHID and the CQC are outlined in the acknowledgements.

Funding LP is funded by an NIHR Doctoral Fellowship (DRF-2017-10-088). The views expressed are those of the authors and not necessarily those of the NIHR or the Department of Health and Social Care.

Competing interests None declared.

Patient and public involvement Patients and/or the public were involved in the design, conduct, reporting or dissemination plans of this research. Refer to the Methods section for further details.

Patient consent for publication Not applicable.

Ethics approval Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available in a public, open access repository. All the data used is publicly available via NHS England (previously NHS Digital), Office for Health Improvement and Disparities, and the Care Quality Commission.

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