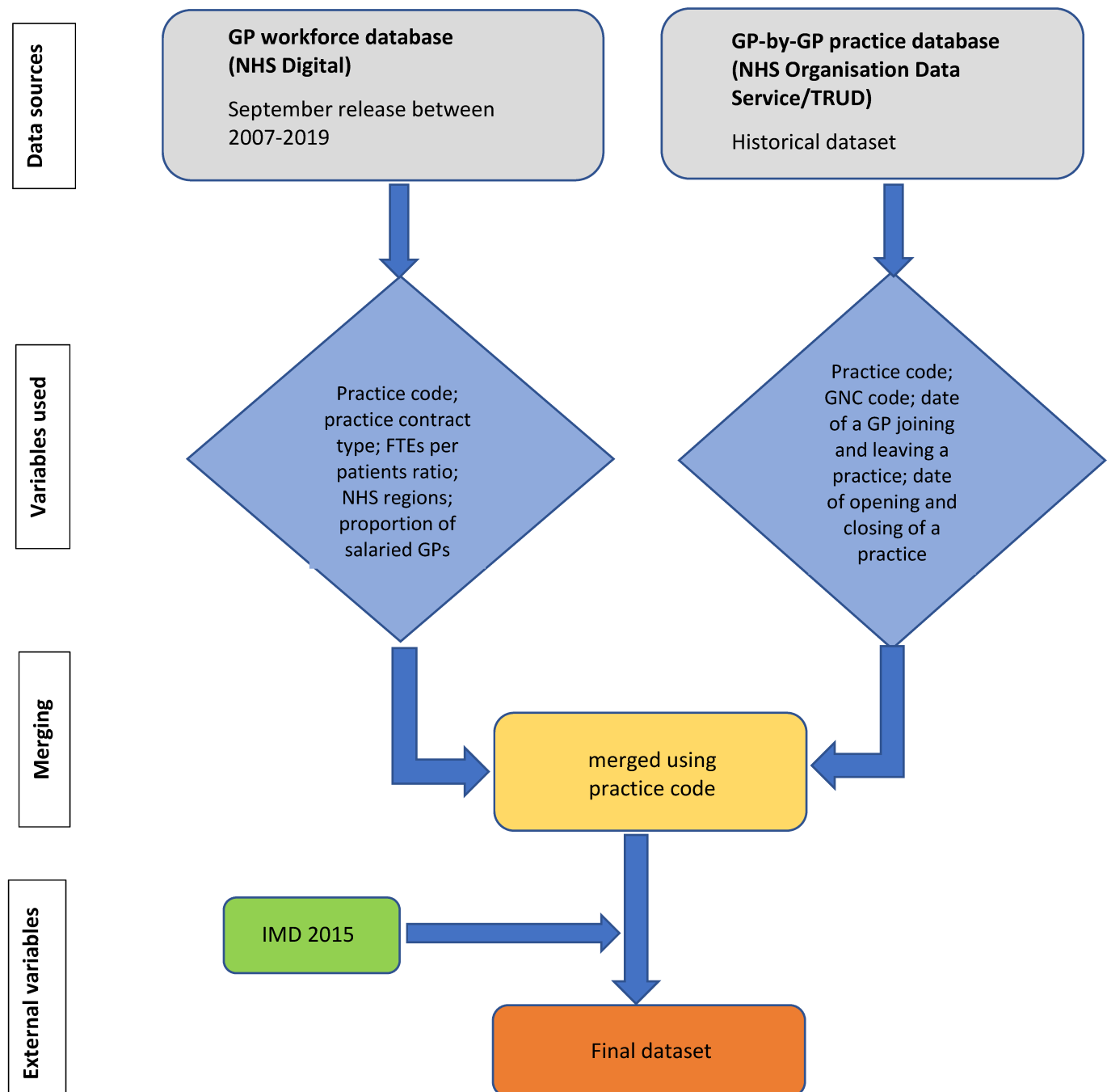
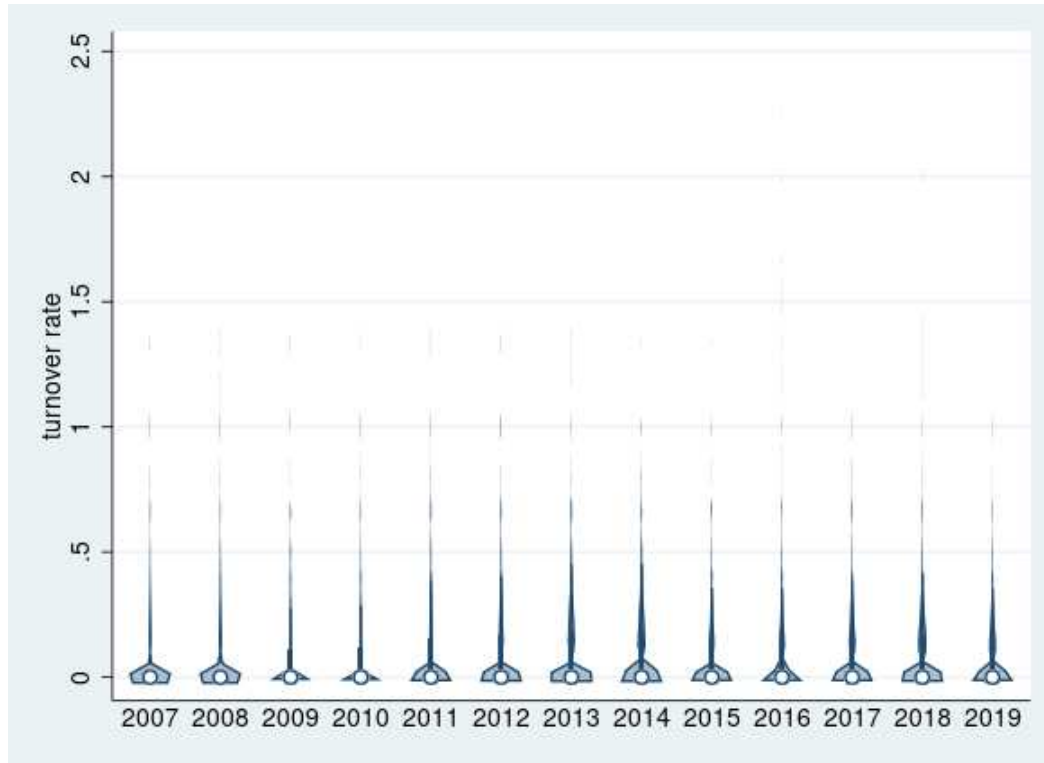


## Supplementary material for “Rates of turnover among general practitioners in England between 2007-2019: a retrospective study”.

Supplementary Figure 1: Flow chart showing the data process



**Supplementary Figure 2: Violin plot for general practitioner (GP) turnover rates between 2007 and 2019**

Note: Turnover rate on the y-axis have not been multiplied by 100.

## GP Joiners' and retention rates

### Definition of GP joiners' and retention rates

Two additional measures were calculated in order to quantify trends of general practitioners (GPs) and their attitude in leaving general practices, joiners' and retention rates, which describe the proportion of GPs who join a practice during the year and the proportion of GPs who stay in a practice for entire year, respectively.

The following definitions of GPs joiners' rates were used:

$$\text{Joiners' rate} = \frac{\text{GPs in a practice who join during the year}}{\text{*Average number of GPs during the year}} \times 100$$

Where:

Average number of GPs in a year= *(GPs in a practice at the start of the year + GPs in a practice at the end of the year)/2*; and

GPs in a practice at the end of the year= *Number of GPs at start of the year + Number of joiners – Number of leavers*

The following definitions of GPs retention rates was used. Retention did not account for GPs who may join during the year.

$$\text{Retention rate} = \frac{\text{GPs in a practice who stay the entire year}}{\text{GPs at the start of the year}} \times 100$$

**Supplementary Table 1. GP joiners' rate between 2007 and 2019.**

year	N practices	Mean	SD	Median	IQR	25th percentile	75th percentile
2007	8085	9.4	20.3	0.0	12.5	0.0	12.5
2008	8053	9.4	20.0	0.0	11.8	0.0	11.8
2009	8077	10.7	21.6	0.0	15.4	0.0	15.4
2010	8058	11.1	21.2	0.0	16.7	0.0	16.7
2011	8009	11.8	21.4	0.0	18.2	0.0	18.2
2012	7924	13.2	21.9	0.0	20.0	0.0	20.0
2013	7809	15.0	23.3	0.0	23.5	0.0	23.5
2014	7629	13.7	22.3	0.0	22.2	0.0	22.2
2015	7404	11.1	20.6	0.0	16.0	0.0	16.0
2016	7211	11.6	19.7	0.0	18.2	0.0	18.2
2017	6963	12.3	20.2	0.0	18.2	0.0	18.2
2018	6757	13.6	20.6	0.0	21.4	0.0	21.4
2019	6598	11.4	18.9	0.0	18.2	0.0	18.2

**Supplementary Table 2: GP retention rates between 2007 and 2019.**

Year	N practices	Mean	SD	Median	IQR	25th percentile	75th percentile
2007	8075	94.7	13.9	100.0	0.0	100.0	100.0
2008	8053	94.2	14.1	100.0	0.0	100.0	100.0
2009	8077	93.0	15.5	100.0	0.0	100.0	100.0
2010	8056	93.0	15.3	100.0	0.0	100.0	100.0
2011	8008	92.1	15.8	100.0	11.1	88.9	100.0
2012	7924	91.6	16.0	100.0	14.3	85.7	100.0
2013	7808	91.1	15.1	100.0	16.2	83.8	100.0
2014	7629	90.8	15.2	100.0	16.7	83.3	100.0
2015	7404	92.3	14.4	100.0	12.5	87.5	100.0
2016	7211	92.5	14.4	100.0	12.5	87.5	100.0
2017	6963	92.3	13.9	100.0	12.5	87.5	100.0
2018	6757	92.0	13.4	100.0	14.3	85.7	100.0
2019	6597	92.5	13.0	100.0	12.5	87.5	100.0

**Supplementary Table 3: Number of practices excluded and distribution of general practitioner (GP) turnover rates**

Year	N practices excluded	N practices where turnover was not missing	Mean	SD	Median	IQR	25th percentile	75th percentile
2007	118	113	166.4	126.7	200.0	150.0	50.0	200.0
2008	177	169	127.5	118.0	200.0	200.0	0.0	200.0
2009	222	201	115.9	129.8	100.0	200.0	0.0	200.0
2010	265	253	111.5	113.0	66.7	200.0	0.0	200.0
2011	299	222	125.7	130.7	200.0	200.0	0.0	200.0
2012	164	155	163.9	177.0	200.0	200.0	0.0	200.0
2013	153	144	204.0	201.7	200.0	0.0	200.0	200.0
2014	244	222	199.8	143.0	200.0	0.0	200.0	200.0
2015	219	204	233.6	151.0	200.0	0.0	200.0	200.0
2016	345	274	195.7	79.8	200.0	0.0	200.0	200.0
2017	391	283	217.3	260.4	200.0	0.0	200.0	200.0
2018	369	221	208.8	92.9	200.0	0.0	200.0	200.0
2019	269	182	196.2	72.4	200.0	0.0	200.0	200.0

**Supplementary Table 4: Persistent high turnover (>10%) over 2, 3, 4, or 5 consecutive years.**

<b>Year</b>	<b>N pract active 2 years</b>	<b>N prac persist high turnover 2 years</b>	<b>% prop prac persist high turnover 2 years</b>	<b>N pract active 3 years</b>	<b>N prac persist high turnover 3 years</b>	<b>% prop prac persist high turnover 3 years</b>	<b>N pract active 4 years</b>	<b>N prac persist high turnover 4 years</b>	<b>% prop prac persist high turnover 4 years</b>	<b>N pract active 5 years</b>	<b>N prac persist high turnover 5 years</b>	<b>% prop prac persist high turnover 5 years</b>
2007	7906	478	6.0	7798	210	2.7	7691	109	1.4	7601	57	0.7
2008	7862	628	8.0	7753	272	3.5	7664	132	1.7	7550	70	0.9
2009	7845	758	9.7	7749	361	4.7	7633	189	2.5	7463	117	1.6
2010	7845	832	10.6	7725	408	5.3	7547	231	3.1	7345	142	1.9
2011	7785	1001	12.9	7601	521	6.9	7392	302	4.1	7158	139	1.9
2012	7615	1189	15.6	7404	629	8.5	7170	274	3.8	6911	141	2.0
2013	7411	1307	17.6	7175	523	7.3	6917	263	3.8	6711	144	2.1
2014	7178	1022	14.2	6917	446	6.4	6712	230	3.4	6548	109	1.7
2015	6897	834	12.1	6692	378	5.6	6527	190	2.9	6527	98	1.5
2016	6742	860	12.8	6576	404	6.1	6576	202	3.1			
2017	6589	966	14.7	6589	417	6.3						
2018	6590	946	14.4									
2019												