

## Inequality analysis of hypertension in Cambridgeshire & Peterborough (August 2020)

### Background

Persistent hypertension increases the risk of many serious conditions, including heart disease and heart attack, stroke, aortic aneurysm, kidney disease and vascular dementia. It is often asymptomatic and unnoticed by patients (1). The cost to NHS in England from conditions attributable to high blood pressure has been estimated to be £2 billion (2).

Hypertension may be associated with increased Covid-19 severity and risk of death in older people although evidence is mixed and still emerging. According to the ISARIC report (updated as of 19 May) a frequency of comorbidities analysis show 45.7% of individuals that contracted Sars-Cov-2 had an history of hypertension (1,012 over 2,212 of patients) - to be noted though that the authors warn that this data should be taken into consideration with caution as the sample size is small due to it being a new variable in their dataset (3). Similarly, cardiovascular disease, hypertension, diabetes, respiratory disease, and cancers were all associated with increased risk of death due to Covid-19 in a large Chinese study describing 44,672 confirmed cases, but which lacked age-correction (4).

Hypertension is very strongly associated with age and when the OpenSAFELY Collaborative study adjusted for this, they showed that in the UK there was no association between hypertension and COVID-19 (HR 0.95, 0.89-1.01) (5). However, in sensitivity analyses, diagnosed hypertension was associated with slightly increased risk (HR 1.07, 1.00-1.15) while high blood pressure ( $\geq 140/90$  mmHg) at the most recent measurement was associated with lower risk (HR 0.61, 0.56-0.67). This study was based on electronic health records of 17 million adult NHS patients) (5).

Sars-Cov-2 appears to mediate cell-entry via binding to ACE2 receptors (6), hence there has been some concern that ACE inhibitors or angiotensin-II receptor antagonists may increase the risk of severe disease. However, NICE states that no conclusion can yet be drawn on whether these drugs affect risk of covid19 or risk of severe disease, and the recommendation is that people on these drugs continue to take them (7).

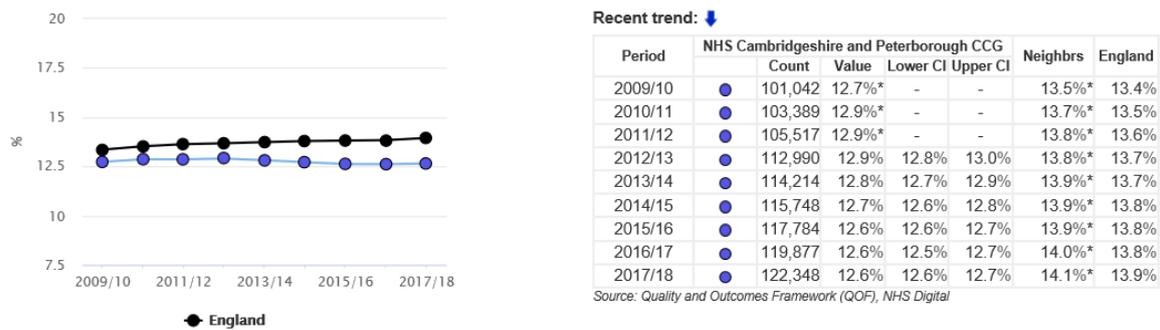
### Objective

Hypertension may increase the risk of severe illness and death from COVID-19, but undiagnosed or inadequately controlled hypertension causes other significant health risks to our population which already impact on healthcare.. Hence, we are reporting the prevalence of hypertension in Cambridgeshire and Peterborough and establishing whether any inequality is present. More precisely we are assessing whether there is a direct correlation between the deprivation of an area and proportion of hypertension. Additionally, we reviewed the scientific literature in order to identify possible barriers and facilitators to reduce the hypertension prevalence in our area.

## Local picture

According to the Global Burden of Disease data, high blood pressure is the third largest risk factor, after smoking and diet, contributing to premature deaths in Cambridgeshire and Peterborough (8) (9) (10). The impact of hypertension on health is also significant, with around 2% of years lived with disability attributable to high blood pressure.

Just over one in eight patients in the CCG has a diagnosis of hypertension (12.7%) (data from 2018/19). This value has been relatively stable over the last ten years (**figure 1**) which is statistically significantly lower than the national rate (14%), which, in contrast, has been increasing over the years.

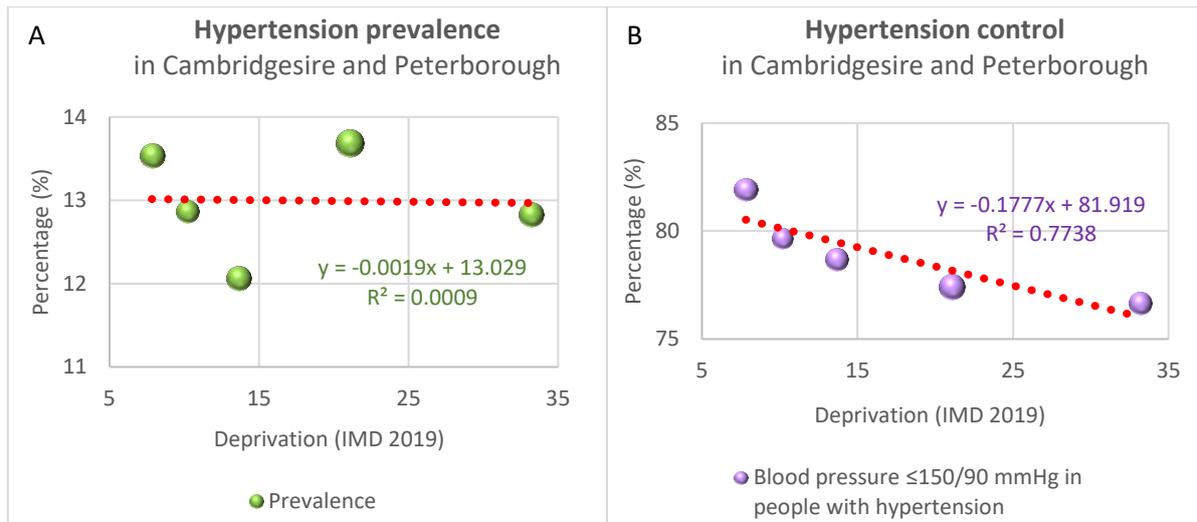


**Figure 1. Hypertension: QOF prevalence (all ages) in Cambridgeshire and Peterborough from 2009/10:** Cambridgeshire & Peterborough is in blue, while the national value is in black. Data taken from CVD profile 2019 (11).

Figure 3 in the appendix shows that at the GP practice level, high prevalence of hypertension appears to be associated with rurality (probably linked to older populations in these areas) and also with deprivation, with two 'high prevalence' (15% or over) practices in Peterborough, three in March and two in Wisbech. The practices with low prevalence (10% or under) are nearly all in Peterborough or Cambridge city, with three others in Huntingdon, St Neots and Cambourne.

Figure 4 in the appendix maps the proportion of patients at each GP practice whose hypertension is well controlled; here the geographical picture is less straightforward. Many of the practices where at least 25% of hypertensive patients have poorly controlled blood pressure are in Cambridge city or in Peterborough, but there are many rural practices as well particularly in the north of the area.

Interestingly, if we cross reference the hypertension prevalence in Cambridgeshire and Peterborough with deprivation we do not see a socio-economic gradient i.e. hypertension prevalence in least and most deprived areas is similar (**Figure 2A**). However, hypertension is strongly associated with increasing age, hence we would possibly get a different answer if prevalence data provided was age standardised. Interestingly if we take into considerations indicators that are less likely to be confounded by age, we notice a stronger link with deprivation e.g. blood pressure in patients from more deprived areas is less likely to be adequately controlled (*'blood pressure readings measured in the previous 12 months are 150/90 mmHg or less'*) (**figure 2B**), and least deprived areas present a better management of the disease by 5 percentage points (**Figure 2B**).



**Figure 2: Analysis of a putative correlation between hypertension and deprivation in Cambridgeshire and Peterborough.** Bubble size is proportional to total registered population; Data is from 2018/19.

While local data on ethnicity and prevalence of high blood pressure is lacking, national data shows that people from an African or African Caribbean background are at higher risk of developing high blood pressure than people from other ethnic groups (12).

### **Barriers to reducing hypertension prevalence**

Undiagnosed hypertension is thought to be very common due to the frequently asymptomatic nature of the condition. As such, reducing the population-wide health risks associated with high blood pressure is more difficult. Programmes to identify unknown hypertensives such as the national ‘Know Your Numbers’ annual campaign can be useful, as can opportunistic checks at healthcare appointments for other reasons (12).

The covid-19 pandemic has caused some concern about some commonly used antihypertensive medication, as mentioned above. Although the current guidance is to continue to take the medication, some patients may choose to stop it with a resulting increase in blood pressure and associated risk.

Lifestyle changes can be effective in reducing blood pressure, including weight loss, reduction in salt and alcohol and caffeine consumption, increasing physical activity and stopping smoking (13). However, not all patients are willing or able to make the necessary lifestyle changes and patients from more affluent areas are more likely to follow lifestyle advice, rather than people with complex health and social problems living in deprived areas. In addition, even where changes are made, medication may still be needed. Compliance with antihypertensive medication can often be improved, given estimates that between 50% to 80% of patients do not take all their prescribed medication (12).

### **Facilitators to reducing population prevalence**

There is a wide range of effective antihypertensive medications and many are well tolerated by most people (14). Good treatment of hypertension will bring blood pressure under control for most individuals and if treatment is offered and adhered to by most patients, the population-level impact of hypertension can be reduced.

Many people are able to control blood pressure with lifestyle change, with the benefit that they may become more engaged with their own health as a result, make other positive changes, and see other health benefits.

The NHS Health Check is a useful way to identify previously unknown hypertension in patients (15), although investing more into Health Checks may not be the best way to prevent cardiovascular deaths and disease.

Better treatment for known hypertensives was recently modelled at the CCG. Improving the proportion of people with good blood pressure control from 57% to 63% over three years would cost around £37 per person per year in increased medication costs, but would save £3m in averted healthcare needs and 251 CVD events over ten years. A Return on Investment modelling tool found that improved use of antihypertensive therapy was by far the most effective way in Cambridgeshire and Peterborough to prevent premature deaths from cardiovascular disease, compared to improved weight management services, NHS Health Checks and self-monitoring of blood pressure.

A recent pilot project in Cambridgeshire and Peterborough which promoted home blood pressure monitoring combined with a medication review found a significant improvement in practice-level control of hypertension.

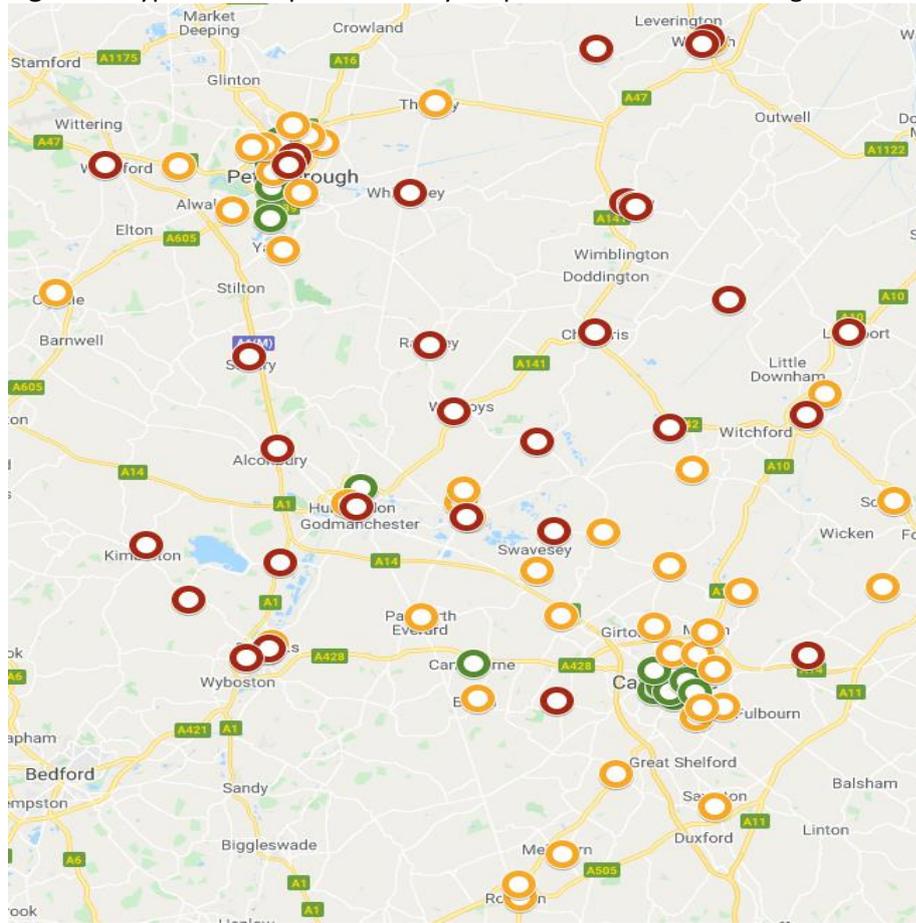
Measuring blood pressure as part of routine primary care and opportunistically in secondary care has a role to play in identifying previously unknown hypertension. Good communication between secondary and primary care is important where hypertension is identified in secondary care.

**Actions:**

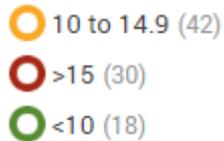
- Work with GPs and pharmacy to improve the proportion of people on the hypertension register with good blood pressure control
- Case finding in deprived practices
- Increase collection of ethnicity recording
- Use of ECLIPSE to undertake equity audits
- Health coaching in deprived practices
- Ensure discharge summaries from secondary care include BP measurements where this has been recorded
- Redistributing hypertension funding to GP clinics by taking into account their IMD score
- Promote the use of self-monitoring amongst all patients with hypertension and provision of BP monitors in deprived areas

## Appendix

**Figure 3:** Hypertension prevalence by GP practice across Cambridgeshire and Peterborough CCG.



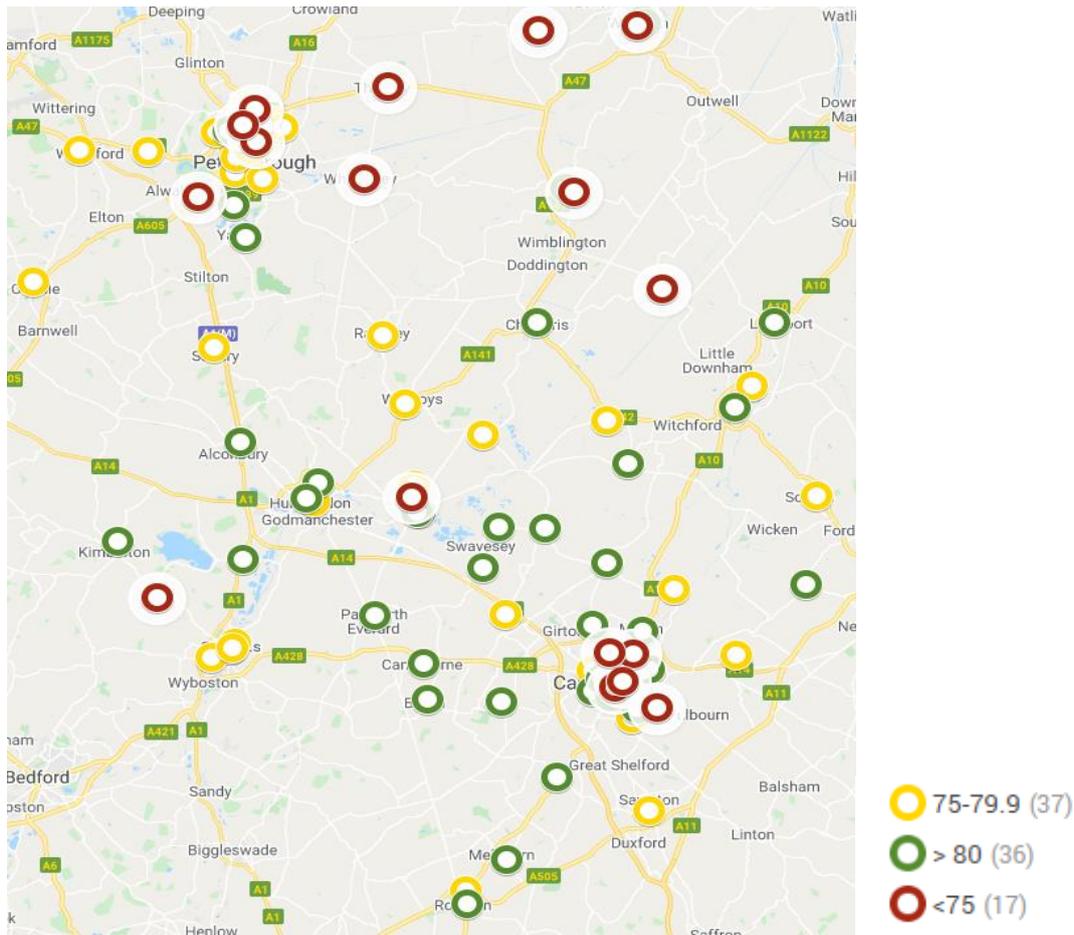
Percentage of patients who are on the QOF register for hypertension, 2018/19 QOF data.



The interactive map is available at

[https://www.google.com/maps/d/drive?state=%7B%22ids%22%3A%5B%221xqtfI0vuUU8OPkTEuKl\\_D0NuJICOnsX%22%5D%2C%22action%22%3A%22open%22%2C%22userId%22%3A%22115403336437621291928%22%7D&usp=sharing](https://www.google.com/maps/d/drive?state=%7B%22ids%22%3A%5B%221xqtfI0vuUU8OPkTEuKl_D0NuJICOnsX%22%5D%2C%22action%22%3A%22open%22%2C%22userId%22%3A%22115403336437621291928%22%7D&usp=sharing)

**Figure 4:** Proportion of patients with well controlled hypertension by GP practice across Cambridgeshire and Peterborough CCG.



Percentage of patients on the hypertension QOF register whose blood pressure is  $\leq 150/90$  mmHg

### **Methods:**

Data for hypertension (all ages) derives from NHS Digital QOF data for 2018/19 (16). In order to assess whether we have inequalities in hypertension prevalence in our area, we cross-referenced this data at GP level with the deprivation score of GP practices in our CCG (using the Index of Multiple Deprivation (IMD) score from 2019) (17). GP practices were ranked by their deprivation score (low value, least deprived; high value, most deprived), split into quintiles and then plotted against '*hypertension prevalence*' or '*last BP reading in last 12mths is  $\leq 150/90$  (den.incl.exc.)*' (indicator CHD002). A linear trendline with the best fit (with equation and coefficient of determination, or R-squared) was added to observe whether there is a directly proportional correlation between hypertension prevalence and increased deprivation. Bubble size is proportional to its total registered population in April 2019.

**Limitations:** We did not have access to QOF data for 2019/20.

## References

1. **NHS**. High blood pressure (hypertension) . *NHS.uk*. [Online] Oct 2019. <https://www.nhs.uk/conditions/high-blood-pressure-hypertension/>.
2. —. Opportunities for action around hypertension highlighted with new resource. *nhs.uk*. [Online] Nov 2016. <https://www.england.nhs.uk/2016/11/hypertension-resource/>.
3. **International Severe Acute Respiratory and Emerging Infections Consortium (ISARIC)**. COVID-19 Report: 19 May 2020. [Online] May 2020. [https://media.tghn.org/medialibrary/2020/05/ISARIC\\_Data\\_Platform\\_COVID-19\\_Report\\_19MAY20.pdf](https://media.tghn.org/medialibrary/2020/05/ISARIC_Data_Platform_COVID-19_Report_19MAY20.pdf).
4. *Clinical determinants for fatality of 44,672 patients with COVID-19*. **Deng, Yin, Chen, Furong**. 179, s.l. : Crit. Care, 2020, Vol. 24.
5. *OpenSAFELY: factors associated with COVID-19-related hospital death in the linked electronic health records of 17 million adult NHS patients*. . **OpenSAFELY**. s.l. : medRxiv (preprint), 2020.
6. *SARS-CoV-2 Cell Entry Depends on ACE2 and TMPRSS2 and Is Blocked by a Clinically Proven Protease Inhibitor*. **Hoffman, Kleine-Weber, Schroeder, Kruger, Herrler, Erichsen**. 2, s.l. : Cell, 2020, Vol. 181. 271-80.
7. **NICE**. COVID-19 rapid evidence summary: angiotensin-converting enzyme inhibitors (ACEIs) or angiotensin receptor blockers (ARBs) in people with or at risk of COVID-19. *NICE.org.uk*. [Online] May 2020. <https://www.nice.org.uk/advice/es24/chapter/Key-messages>.
8. **Ford, Peacey, Saiu, Head**. Health Insight and Intelligence Report: Estimating the impact of risk factors on health and care costs (Dec 2019). <https://www.cambridgeshireandpeterboroughccg.nhs.uk/health-professionals/news-and-resources/health-intelligence-reports/>. [Online] Dec 2019. <https://www.cambridgeshireandpeterboroughccg.nhs.uk/easysiteweb/getresource.axd?assetid=21636&type=0&servicetype=1ford>.
9. **Global Burden of Disease**. Results tool with data for Cambridgeshire and Peterborough can be produced at. <http://ghdx.healthdata.org/gbd-results-tool>. [Online]
10. *Global burden of hypertension: analysis of worldwide data*. **Kearney, Whelton, Reynolds, Muntner, Whelton, He**. 9455, s.l. : Lancet, 2005, Vol. 365. 217--23.
11. **Gowers & Robson**. Cardiovascular Disease Profile (November 2019). *Cambridgeshire Insight*. [Online] Dec 2019. <https://cambridgeshireinsight.org.uk/wp-content/uploads/2020/03/CVD-Profile-November-2019-v-1.0.pdf>.
12. **Gov.uk**. Health matters: combating high blood pressure. *Gov.uk*. [Online] Jan 2017. <https://www.gov.uk/government/publications/health-matters-combating-high-blood-pressure/health-matters-combating-high-blood-pressure#:~:text=In%20England%2C%20people%20from%20Black,groups%20is%20not%20always%20apparent..>
13. **NHS**. Treatment - High blood pressure (hypertension). *nhs.uk*. [Online] Oct 2019. <https://www.nhs.uk/conditions/high-blood-pressure-hypertension/treatment/>.
14. **NICE**. Hypertension in adults: diagnosis and management. *nice.org.uk*. [Online] Aug 2019. <https://www.nice.org.uk/guidance/ng136/chapter/Recommendations#choosing-antihypertensive-drug-treatment-for-people-with-or-without-type-2-diabetes>.
15. *The NHS Health Check in England: an evaluation of the first 4 years* . **Robson**. s.l. : BMJ, 2015, Vol. 6. e008840.

16. **Public Health England.** Fingertips. *Public Health Profiles*. [Online] <https://fingertips.phe.org.uk/search/hypertension#page/0/gid/1/pat/152/par/E38000026/ati/7/cid/4/page-options/ovw-do-0>.
17. —. National General Practice Profiles. *Fingertips*. [Online] 2019. <https://fingertips.phe.org.uk/profile/general-practice/data#page/9/gid/2000005/pat/152/par/E38000026/ati/7/are/D81633/iid/93553/age/1/sex/4/cid/4>.
18. **National General Practice Profiles. Fingertips.** [Online] Public Health England, 2015. [Cited: November 18, 2019.] <https://fingertips.phe.org.uk/profile/general-practice/data#page/9/gid/2000005/pat/152/par/E38000001/ati/7/are/B83620/iid/91872/age/1/sex/4>.

Authors: V.P. (Specialty Registrar in Public Health) and P.S. (Research Officer), Clinical Outcomes and Population Health Strategy, Cambridgeshire and Peterborough Clinical Commissioning Group.

August 2020