THE IMPACT OF THE COVID-19 PANDEMIC ON CARDIOVASCULAR DISEASE PREVENTION AND CORRESPONDING GEOGRAPHICAL INEQUALITIES IN ENGLAND

+LCP powering possibility

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Summary

+ There has been disruption to the diagnosis of hypertension and atrial fibrillation (AF) during the COVID-19 pandemic.

+ We observed 143,822 fewer diagnoses of hypertension, 60,330 fewer diagnoses of AF and 1.79% fewer prescriptions for these conditions over the COVID-19 impact period.

+ There was substantial variation across geography. 20% of Sub Integrated Care Boards account for approximately 62% of all missed diagnoses of hypertension and 54% of all missed diagnoses of AF.

+ Our study highlights the utility of administrative and geographically granular datasets to inform targeted efforts to mitigate the indirect impacts of the pandemic through applied secondary prevention measures.

Background

• The **COVID-19 pandemic** has indirectly impacted the burden of noncommunicable disease in the population by disrupting diagnosis and management.

• While **excess mortality** from cardiovascular disease (CVD) **has been persistently high during 2022**[1], it is likely that nonfatal outcomes have also been affected.

• A recent publication found that almost **500,000 individuals missed out on antihypertensive** medications in England, Wales and Scotland between March 2020 and July 2021[2].

• We aimed to use publicly available data to:

  - estimate the **change in diagnosed prevalence and prescription indicators for hypertension and atrial fibrillation (AF)** and assess corresponding geographical inequalities.

Methods

• We used the Quality and Outcomes Framework (2016/17 to 2021/22) data to measure the diagnosis of AF and hypertension.

• We used the English Prescribing Dataset (2018 to 2022) to obtain information on monthly prescription items.

• We described age standardised prevalence of disease and the rates of **prescription items** for **hypertension** and **AF** by geography and over time.

• We estimated the impact of the pandemic on missed diagnoses (April 2020 to March 2021) and on the percentage change in medicines prescribed (March 2020 and April 2022) for these conditions using an **interrupted time-series (ITS) analysis**.

• ITS analysis was on the pre- and post-COVID data at Sub Integrated Care Boards (sub-ICB) level, which captures the shift in levels (β_2) and in the trend of the outcome (β_3).

• Since each sub-ICB follows a different trend and starts at a different slope, we employed a random effects (mixed-effects) model. The Model was:

$$Y_{it} = \beta_0 + \beta_1 T_{it} + \beta_2 COVID_{it} + \beta_3 COVID_{it}T_{it} + b_{0i} + b_{1i} T_{it} + \epsilon_{it}$$

  - Y_{it} is the outcome for sub-ICB i at time t.
  - T is a variable representing time, which was measured either in months or years, depending on the outcome in question.
  - COVID is a dummy variable, taking a value of 0 in the pre-COVID period and 1 in the post-COVID period.
  - b_{0i} is the random intercept for sub-ICB$_i$.
  - b_{1i} T_{it} is the random slope effect for sub-ICB$_i$ which captures the deviation of the trend for sub-ICB$_i$ from the average trend.
  - ϵ_{it} t is the error term.

Results

• The age standardised prevalence rate in England in 2019/20 compared to 2021/22 was

  - **15.55%** between 2019/20, **decreasing** to **15.11%** in 2021/22 for hypertension.

  - **2.55%** in 2019/20, **increasing** to **2.66%** in 2021/22 for AF.

• Our analysis suggests that over the COVID-19 impact period there were:

  ♡ **143,822 fewer** (p=0.001) diagnoses of **hypertension** (95%CI: -226,144, -61,500)

  ⚕ **60,330 fewer** (p=0.001) diagnoses of **Atrial Fibrillation** (95%CI: -83,216, -37,444)

  💊 **1.79% fewer** (p<0.0001) **prescriptions** (95%CI: -2.37%, -1.22%)

• There was **variation across geography** in England in terms of the indirect impact of the COVID-19 pandemic on the diagnosis (Figure 1) and prescription rates (Figure 2) of hypertension and AF.

  - **20% sub-ICB** account for approximately **62%** of all missed diagnoses of hypertension (Figure 3) and **54%** of all missed diagnoses of AF.

Geographical inequalities in prevalence and in the impact of the pandemic on diagnosis were observed
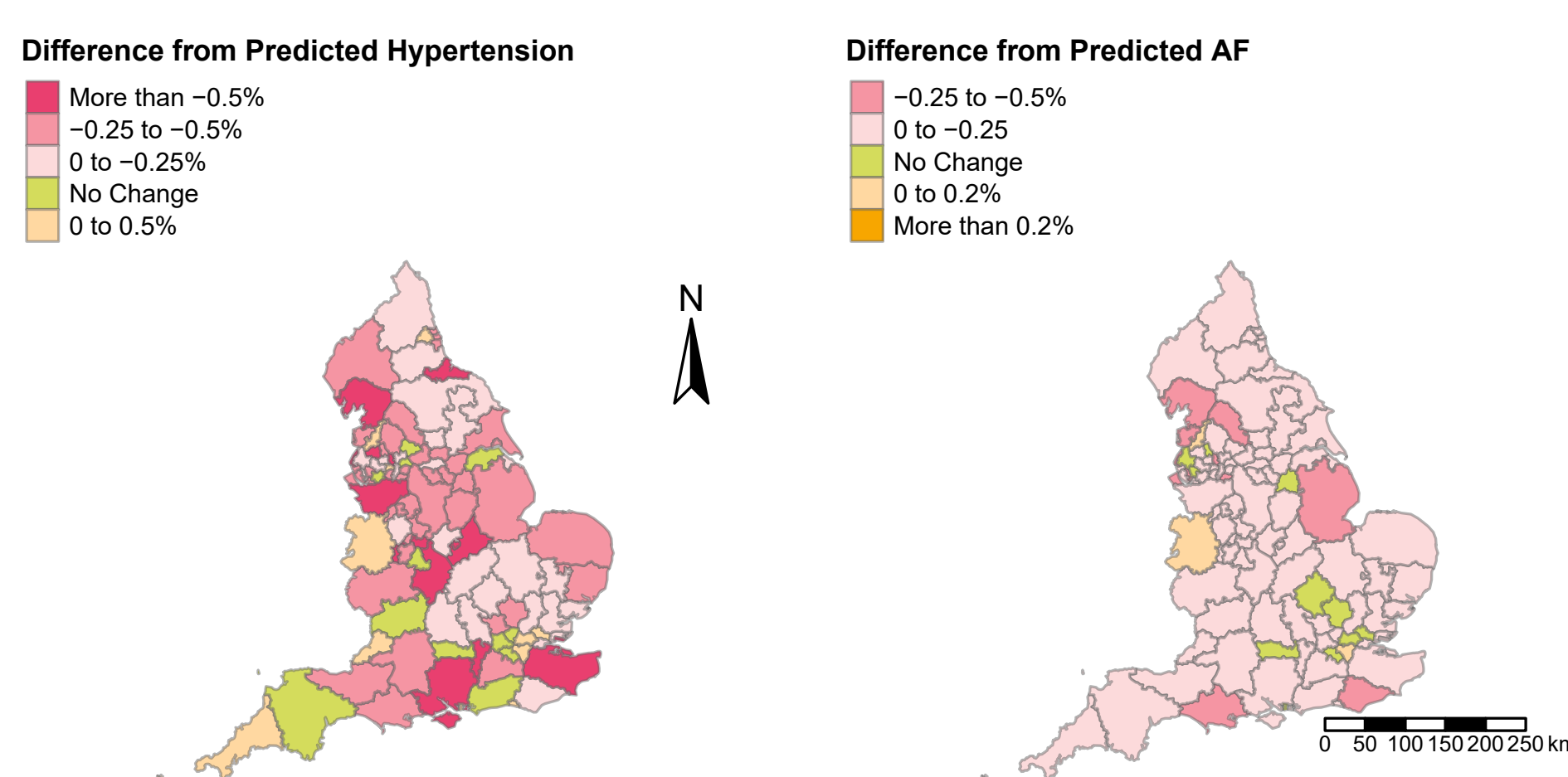

Figure 1. Sub-ICB age standardised prevalence of hypertension and atrial fibrillation for the difference between observed and expected prevalence for 2021/22

Visit the study's online dashboard to explore results in detail

References

1. Office for Health Improvement and Disparities. Excess mortality in England and English regions. GOV.UK. 2023 [cited 2023 Mar 16].
2. Dale CE, et al. The impact of the COVID-19 pandemic on cardiovascular disease prevention and management. Nat Med. 2023 Jan;29(1):219-25.

Most sub-ICBs prescribed fewer oral anticoagulants after the start of the pandemic
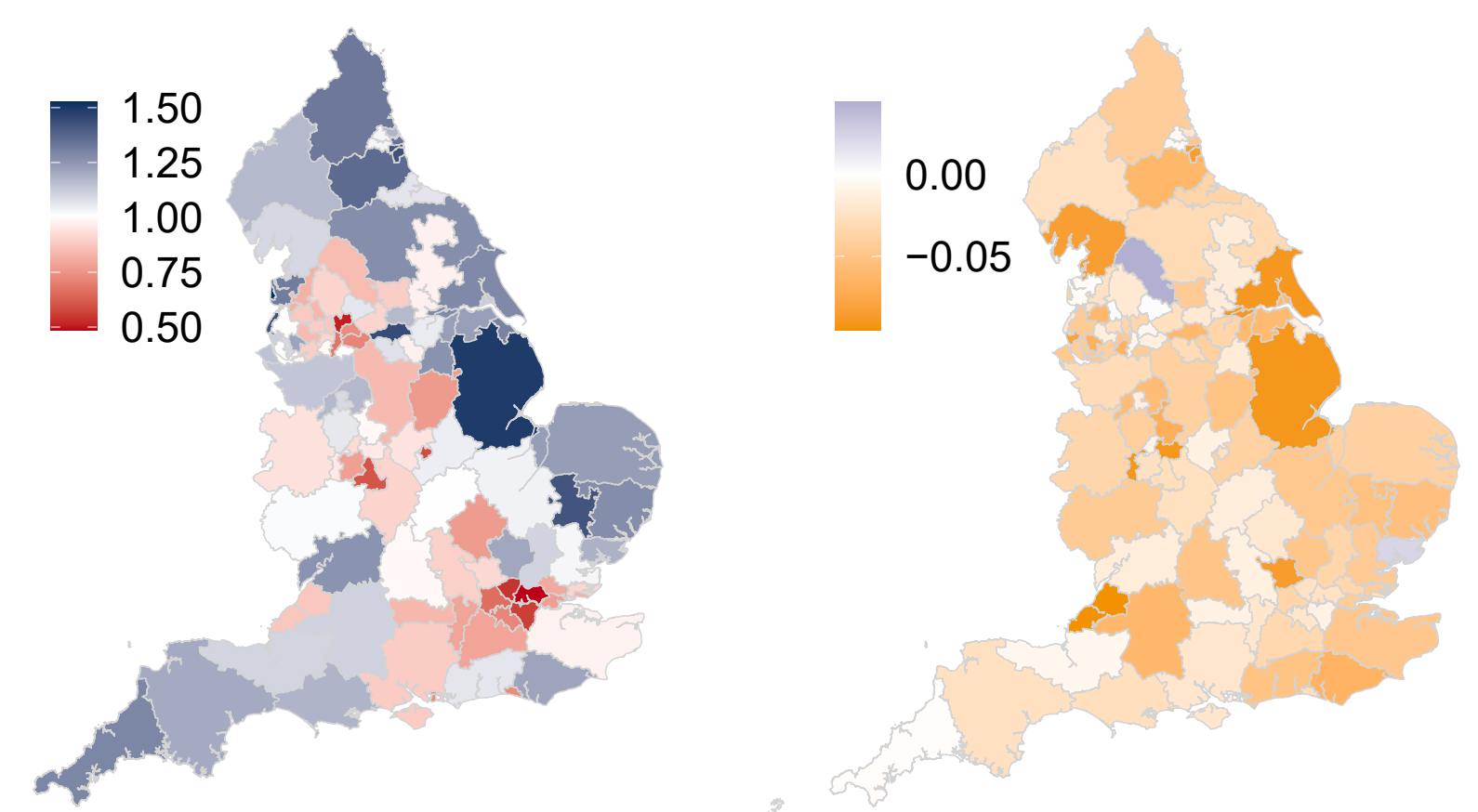

Figure 2. Sub-ICB level average monthly prescription items per 1,000 person days (i) and difference between observed and expected prescription rate (ii) between March 2020 and April 2022

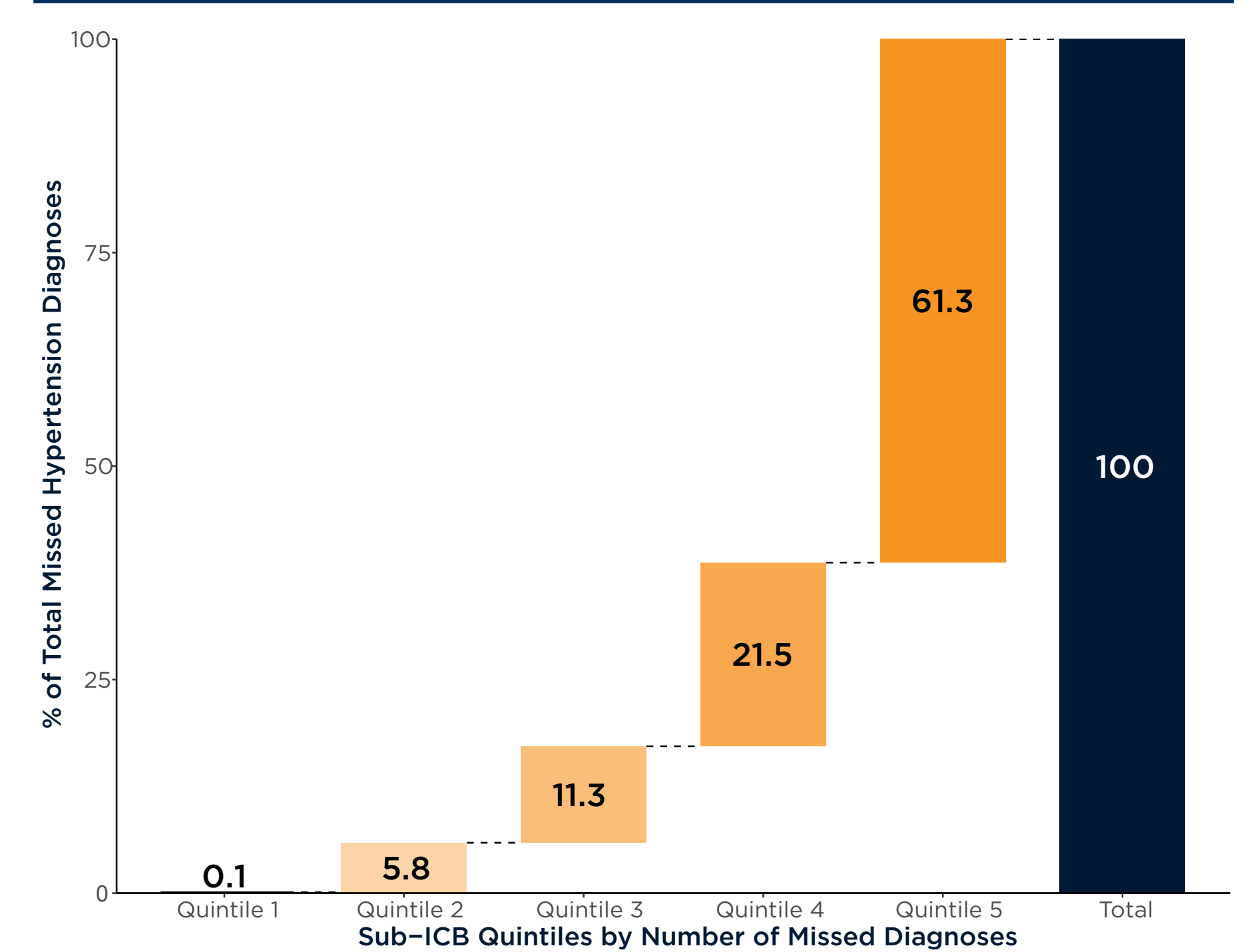### 62% of all missed hypertension diagnoses were concentrated in 20% of sub-ICBs

Figure 3. Missed diagnoses of hypertension (at Sub-ICB level) between April 2020 and March 2021, stratified by quintile

Conclusions

• **Geographical inequalities** in the management of CVD during the pandemic were observed.

• They are likely to be reflected in **worsening cardiovascular outcomes** in years to come.

• Small-area estimations of the pandemic's indirect impact on CVD can support policymakers designing targeted approaches to addressing unmet.

• This study can support policymakers **designing targeted approaches** to addressing unmet need providing best value for money

• This analysis is based on **publicly available data** avoiding the need for patient-level repositories.