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**Reducing Inequality in Avoidable Emergency Admissions:  
Case Studies of Local Health Care Systems in England using  
a realist approach**

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Title page

Reducing Inequality in Avoidable Emergency Admissions: Case Studies of Local Health Care Systems in England using a realist approach

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Under Review

**Reducing Inequality in Avoidable Emergency Admissions: Case Studies of Local Health Care Systems Using a Realist Approach**

*Background*

People in disadvantaged areas are more likely to have an avoidable emergency hospital admission. Socio-economic inequality in avoidable emergency hospital admissions is monitored in England. Our aim was to inform local healthcare purchasing and planning by identifying recent healthcare system changes (or other factors), as reported by local health system leaders, that might explain narrowing or widening trends ~~to inform healthcare commissioning~~.

*Methods*

Case studies were undertaken in one pilot and five geographically distinct local health care systems (Clinical Commissioning Groups, CCGs), identified as having consistently increasing or decreasing inequality. Local settings were explored through discussions with ~~key~~ CCG officials and stakeholders to identify potential local determinants. Data were analysed using a realist evaluation approach to generate context-mechanism-outcome (CMO) configurations.

*Findings*

Of the five CCGs two had narrowing inequality, two widening, and one narrowing inequality which widened during the project. We held 40 discussions with 45 CCG representatives including clinical staff, analysts, programme managers, patient representatives and public health specialists.

None of the CCGs had ~~specifically~~ designed a large-scale package of service changes with the explicit aim of reducing socio-economic inequality in ~~avoidable admissions~~avoidable emergency admissions and local decision makers were unfamiliar with their own trends. Potential pPrimary and community care determinants factors included: workforce; case finding and exclusion; proactive care co-ordination for patients with complex needs; and access and quality. Potential cCommissioning determinants factors included: data use and incentives; and targeting of services. Other ~~factors~~potential determinants included changes in care home services, national A&E targets, and wider issues such as public services financial constraints, residential gentrification, and health care expectations.

*Conclusion*

We did not find any bespoke initiatives that explained the inequality trends. The trends are more likely due to an interplay of multiple healthcare and wider system factors. Local decision makers ~~need need~~ greater awareness, understanding and support to interpret, use and act upon inequality indicators. They are unlikely to find simple, cheap interventions to reduce inequalities in avoidable emergency admissions. ,rRather, long-term multifaceted interventions are required that embed inequality considerations into mainstream decision making.

**Keywords:**

Health inequalities, avoidable admissions, healthcare systems, quality improvement

Under Review

Introduction

People from socio-economically disadvantaged areas are more likely to have a potentially avoidable hospital admission. For example, people living in the most disadvantaged fifth of neighbourhoods in England have a 71% higher emergency admission rate than those in the most affluent fifth with inequality in hospital admissions estimated to cost the NHS about £4.8billion per year[1]. [Emergency admissions have been steady growing over the past 10 years, even after adjustment for an aging population the Health Foundation found that admissions grew by 1.1% per year](#)[2]. About 1 in 7 ~~emergency of these~~ admissions are classified as “avoidable” (from a health service perspective) or “ambulatory care sensitive” because they reflect conditions, such as asthma and heart failure, for which good quality primary care could prevent acute deterioration demanding emergency admissions[3]. [About three quarters of ambulatory care sensitive admissions are admitted through emergency departments and the commonest reasons are influenza and pneumonia, chronic obstructive pulmonary disease and ear, nose and throat infections](#)[4]. [The proportion of ambulatory care sensitive admissions to all admissions has increased over time from 4.4% in 2013 to 5.1% in 2018](#)[4]. Differences in these ~~avoidable admissions~~ [avoidable emergency admissions](#) to hospitals are closely associated with socio-economic disadvantage; a previous study of over 3 million admissions in the UK estimated that over 70% of small area geographic variation in admission rates was associated with deprivation[5] and most, but not all, of this was driven by deprivation-related differences in morbidity[6]. [Other studies have found that primary care quality is significantly associated with avoidable emergency admissions, although the contribution is small](#)[7], [and quality of primary care tends to be worse in deprived areas](#)[8]. [Prentice and colleagues found that hospitals with longer waiting times also had higher admissions for avoidable emergency admissions](#)[9], [while this may be due to](#)

[uncontrolled confounding, it may also be possible that delays in secondary care led to more avoidable emergency admissions. In the UK, deprivation is usually measured using the Index of Multiple deprivation which is a relative measure consisting of seven weighted domains; Income; Employment; Education; Skills and Training; Health and Disability; Crime; Barriers to Housing Services; Living Environment. It is widely used for risk-adjustment of quality indicators.](#)

In England, the NHS has a mandate to reduce health inequalities in access and outcomes through improved service design and delivery and “must ensure commissioning focuses on measurable reductions in inequalities in access to health services, in people’s experience of the health system, and across a specified range of health outcomes”[10]. Commissioning mostly occurs through Clinical Commissioning Groups (CCGs), which receive about 75% of the NHS budget to commission and plan local health care services. There are currently 135 CCGs, covering an average population of 440,000 (range 100,000 to 2million). Part of the inequalities mandate involves the publication of local indicators showing inequality in avoidable emergency admission [11]. One of these indicators is the Absolute Gradient Index (AGI) of deprivation-related inequality in emergency hospitalisation for chronic ambulatory care sensitive and urgent care sensitive conditions [12]. The AGI is a slope index of inequality (a weighted measure of the absolute difference in health indicators between the most and least disadvantaged population groups) which is comparable between different local populations because it uses national rather than local ranks of deprivation as the independent variable.

In December 2018, NHS England published local data packs for each CCG with in-depth analyses of local AGI indicator trends [13], showing that inequality in [avoidable admissions](#) [avoidable emergency admissions](#) narrowed over time in some CCGs and widened in others. In the absence of a detailed understanding of local context, however, the reasons for these divergent local trends and lessons for policy-makers remain unclear. We therefore aimed to identify recent healthcare system changes and other factors, as reported by local health care leaders, that might plausibly help to explain widening or narrowing inequality in avoidable emergency admissions them using realist methods [\[14\]](#) [14]. We had the following objectives:

1. Identify example CCGs with narrowing or widening inequality in [avoidable admissions](#) [avoidable emergency admissions](#).
2. Identify potential explanations for these inequality trends and their underlying mechanisms, with particular attention to recent system-wide changes in local healthcare organisation and delivery.

[Realist approaches are an established methodology that seeks to understand the context and underlying mechanisms that produce outcomes](#)[\[14\]](#)as. The methods allow research to [explore the contexts in which interventions occur to understand how these contexts produce different outcome. An established analytical approach is used through generating context-mechanism-outcome \(CMO\) configuration which combine to produce one overall programme theory](#). Although our primary focus was on factors under the control of local health care planners, we also explored wider determinants of inequality trends in potentially [avoidable admissions](#) [avoidable emergency admissions](#) [\[15\]](#). While the data packs primarily focus on socio-economic inequality, we also asked our informants to

consider other aspects of social disadvantage, such as ethnicity, which may contribute to socio-economic differences.

Under Review

**Methods**

Case studies adopting a realist approach were used. Five sites, with one pilot, were chosen to balance sufficient depth of analysis and breadth of experience. Formal ethical approval was not required because the project met the Health Research Authority definition of Service Evaluation[15]. This was confirmed by the chair of the University of York Department of Health Science Research Governance Committee.

*Identification of case study CCGs*

We used two different data sources to identify candidate CCGs with either widening or narrowing inequality. The first and primary source was the official NHS England AGI indicator data from the CCG Improvement and Assessment Framework; available at CCG level for a three-year period from 2015/16 to 2017/18. The second source was the University of York AGI data for upper tier local authorities; available for a five-year time period from 2012/13 to 2016/17[16]. We initially identified CCGs with a consistently increasing or decreasing trend in AGI (defined as three annual time periods) in the NHS England data and local authorities with consistent increase or decrease (defined as the trend for three or more time-periods). We then cross-validated the local authorities to the associated CCG.

This process produced a longlist of potential CCGs which was reviewed by two team members (JF and JK) independently to produce a shortlist of potential case study sites based on the following criteria:

- 1) Consistent trends in the CCG *and* local authority data;

2) Range of deprivation in the CCG, prioritising those CCGs with neighbourhoods across all national deprivation decile groups;

3) Consistent trend of AGI shown in the associated publicly available NHS packs

Case studies were then selected from the shortlist through discussion within the research team to identify geographically discrete CCGs with the steepest gradients.

We conducted a pilot case study to test and refine the methodology, including processes for organising discussions with CCG staff, collecting data and applying realist evaluation principles. The pilot site was selected for reasons of geographical convenience and where relevant data was included.

#### *Case study methodology*

The Clinical Chair or Accountable Officer of each of the chosen CCGs was approached (via a formal letter sent by email) to discuss the evaluation with the project leads (JF and JK). CCGs were informed about what the data showed and purpose of the evaluation. Once a CCG agreed to take part (all did), we undertook a desktop review of publicly available documents and data using national data sources, such as the PHE Fingertips tool[17], local Joint Strategic Needs Assessment websites and documents on the CCG and associated LA website [to understand the local area before speaking to staff](#). Information was gathered in a single, standardised format which informed subsequent visits.

A member of the CCG helped to arrange a series of discussions with key CCG officials and stakeholders; usually over two days. Where possible both evaluation leads attended. The

key stakeholders requested included: Clinical Chair; Accountable or Chief Officer; Head of Programme Analytics or data analyst; commissioning lead for primary care; commissioning lead for urgent/emergency care; lay member of CCG; and Director of Public Health or Public Health consultant (as they hold CCG board positions). Discussions were either held with individuals or small groups depending on local arrangements and were guided by a list of standard questions (see Supplementary Material). The focus of discussions included actions that the CCG had undertaken to address health inequalities, as well as any significant system-wide changes over the past three to five years. Where explanations were suggested by staff, data or more detailed evidence to ascertain the credibility of statements was requested. Discussions were audio-recorded, but not transcribed because of [time-capacity](#) constraints. Field notes were taken during and after the meetings. Data was collected from March to October 2019.

The evaluation leads independently re-listened to all discussion audios to generate [context-mechanism-outcome \(CMO\)-CMO](#) configurations for each CCG using a realist logic of analysis[14]. These were then compared and discussed to agree a list of CMOs for each site. CMOs were further refined based on additional information provided from the CCG after the discussions alongside revisiting the discussion audios; with some CMOs being dropped or other given more weight depending on their credibility. [For example, if a certain factor was mentioned but occurred after the change in inequalities trend this would viewed as less credible than factors which had a credible temporal relationship.](#) The CMOs from each site were then synthesised into one overall list by grouping them together into broad categories. This was presented in a programme theory diagram. The CMO configurations describe the main potential determinants and underlying mechanisms raised by informants but are not

intended to be mutually exclusive or independent. [The initial findings were sent to the local participating health systems to ensure factual accuracy and discussed at a multi-disciplinary workshop.](#) -

Under Review

**Findings**

Based on the two data sources, we produced a longlist of 52 potential CCGs. Using the criteria, we then identified a shortlist of 16 potential sites, with three geographical clusters in London, Manchester and Essex, and selected five sites. Two had narrowing inequality (CCG A-Improving, CCG B-Improving) which we labelled “Improving”, one had narrowing inequality which widened during the course of the evaluation, which we labelled “Improving then worsening” (CCG C-Mixed) and two had widening inequality (CCG D-Worsening and CCG E-Worsening) which we labelled “Worsening”. CCG D-Worsening has a joint management structure with another CCG, so data was collected on both CCGs. The trend for each CCG is shown in the Supplementary Material.

In total we held 40 discussions across all CCGs with 45 different representatives (see table 1). The number of individuals spoken to within each CCG ranged from five to ten.

*Overarching programme theory*

Most of the health care officials we spoke to were aware of the data packs but could not describe the contents or broad implications for their CCG, with the exception of data analysts. None of the CCGs we visited reported specific services or strategies were in place currently or previously to reduce inequality in avoidable hospital admissions. Those CCGs with a reducing inequality in avoidable hospital admissions had consciously put plans in place with the specific aim of reducing *inequalities* in avoidable emergency admissions. However, all had services and plans in place to reduce the *total* level of avoidable emergency admissions.

From discussions, we identified 17 factors that contributed to the inequality trend in [avoidable admissions](#)[avoidable emergency admissions](#), as shown in Figure 1 and Table 2.

We identified five key drivers of change in [avoidable admissions](#)[avoidable emergency admissions](#) inequality, four within the health system and one wider factor beyond the control of the health system.

1. *Design and delivery of primary care and NHS community healthcare services*

CCG staff considered that both changes in access to and quality of primary care were important for managing complex patient cases in the community setting. In *CCG C-Mixed* and *E-Worsening* staff reported that practices with worsening performance in recent years (exemplified by poorer Care Quality Commission ratings) tended to be in more disadvantaged areas and this may lead to higher avoidable emergency admissions (CMO1 in ).

*CCG C-Mixed* reported having undertaken programmes of work in some of the most deprived areas to identify patients who consistently exception reported (excluded) from the quality outcome framework (QOF) system [\(quality-related programme of financial incentives in primary care\)](#) as they do not respond to invite letters and are considered difficult to engage with. Through efforts to identify and support these cohorts, they reported improved engagement in primary care (CMO2). This meant patients were more likely to contact primary care earlier and during acute deterioration, rather than automatically attending A&E. In *CCG C-Mixed*, this was coupled with a Focused Care programme established in 2010 that aspired, in conjunction with partners, to deliver

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proactive care in disadvantaged areas to improve prevention, health literacy, self-management and community development (CMO3). The programme also provided proactive health and welfare support to individuals with health and wider social issues that put them at an increased risk of emergency attendance and admission (CMO4).

Reduced workforce capacity and capability in primary care in recent years was a recurrent theme. A reduction in both primary care and community care workforce over time, especially in disadvantaged areas, was reported to reduce the ability to deal with acute deterioration making emergency admissions more likely (CMO5). According to informants in *CCG-D Worsening*, the deterioration in primary care staff’s capability to manage patients with complex health and social needs could be due to recent retirement of senior GPs who have had been leaders within the health care system who are replaced by either younger doctors or allied health professionals that are likely to be more risk adverse and refer patients directly to A&E (CMO6). To overcome workforce issues, some practices relied on short-term locums who are not necessarily able to provide the same level of continuity of care, and this might have led to a decreased likelihood of trying to manage acute deteriorations in the community (CMO7). If indeed reduced workforce capacity and capability in recent years was more prevalent in disadvantaged practices, this may explain the widening socio-economic inequalities in avoidable emergency admissions over time experienced in some CCGs.

Primary care staff in *CCG-E Worsening* reported that increased time pressures in recent years, coupled with increased communication challenges, led to increased uncertainty of

diagnosis and a higher likelihood of urgent referral to secondary care or attendance at A&E for investigations to rule out serious pathology (CMO8).

CCG *B-Improving* and *C-Mixed* reported the positive effect of merging general practices in underserved areas and using specific contracts (such as the Alternative Provider Medical Service contract targeted at underserved areas) to improve primary care access in more deprived areas (CMO9).

## 2. Key performance indicators in secondary care settings

Increasing difficulty in meeting the national four-hour wait target for A&E care (95% of patients to be seen within four hours of attendance) was reported to lead to an increased likelihood of short-stay emergency admission especially for people with complex health or social needs who were more likely to be disadvantaged (CMO10).

## 3. Preventative interventions in community care settings

In some areas, CCG staff reported that many care homes are situated in deprived areas and that interventions aimed at improving specific care home services and reducing [avoidable admissions](#) [avoidable emergency admissions](#) may have led to reductions in emergency admissions from deprived areas (CMO11). One example was a care home support package introduced in care homes in *CCG C-Mixed* in 2014/15 to proactively plan healthcare for care home residents. GPs were allocated care homes in their patch and incentivised to deliver six monthly holistic reviews of residents and put in place anticipatory care plans. An audit, following the programme's introduction, is reported to have found that emergency

admissions reduced (personal communication Clinical Director for Urgent Care, CCG C-Mixed).

4. *Oversight and process of commissioning local health services*

CCG B-Improving developed a local primary care dashboard that collated and provided general practices with their own metrics. This allowed GPs and primary care leads to benchmark practices in the CCG. CCG staff reported that this was effective in improving performance and reducing admissions in practices with high admissions because of peer pressure (CMO12). Furthermore, CCG B-Improving reported processes to identify and support practices that were struggling and introduction of financial incentives, through locally enhanced services in primary care that aimed to help minimise unnecessary emergency hospital admissions (CMO13). The CCG also tried to engage with member practices in health care service design and transformation. Approaches included monthly meetings between GPs and CCG leads, being on hand to support primary care practice and clear messages about practice specific targets.

The use of data, or lack, was reported to be important by CCG staff. Staff from two CCGs reported not having an “operating structure to use data”, such as mapping admissions by small area. Additionally, restrictions introduced as part of the Health and Social Care Act 2012, were reported to have impeded access to patient level data. However, there were reports, such as from CCG B-Improving, of health service commissioners using data-informed approaches to target services to the highest need and inequality (CMO14).

5. *Wider socio-economic, cultural and environmental changes in the local area*

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3 In CCGs *C-Mixed*, *E-Worsening* and *A-Improving* staff reported that their local area had  
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5 become either more gentrified or more deprived. *CCG A-Improving* has become  
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7 increasingly gentrified, with some of the traditionally more deprived areas being re-  
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9 developed. This resulted in a change in the composition of the local populations. More  
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11 affluent people moving to *CCG A-Improving* and more people on lower incomes moving into  
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13 *CCG C-Mixed* and *E-Worsening*. In turn this changed the health needs of the population and  
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15 requirement for secondary care. When this interacts with financial constraints within public  
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17 services, there can be worsening community resilience leading to a reduction in the ability  
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19 to manage health problems in the community (CMO15 and CMO16).  
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28 *CCG C-Mixed* had been used as a pilot site for the roll-out of Universal Credit (a payment to  
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30 help with living costs [given to people on low incomes, out of work or who cannot work](#)) and  
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32 staff reported this had resulted in many residents facing significant financial hardships,  
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34 especially in the most deprived areas of the CCG (CMO16). [In turn this may have led to](#)  
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36 [deteriorating mental and physical health with reduced resilience and capacity to remain](#)  
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38 [independent in the community.](#)  
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45 Most CCGs also mentioned the influence of increasing international migration on health  
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47 inequalities. Individuals who moved to the UK were reportedly more likely to live in more  
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49 deprived areas because of the cheaper living costs. In the context of a high proportion of  
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51 people with different experience and expectations of health care, there is confusion and  
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53 reduced healthcare services literacy, resulting in an increased likelihood of attendance at  
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55 the local A&E (CMO17).  
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Under Review

## Discussion

### *Summary of principal findings*

We did not find a simple explanation for any of the increasing or decreasing trends in our five CCG sites, and none of the CCGs had specifically designed a large-scale package of service changes with the explicit aim of reducing socio-economic inequality in [avoidable admissions](#) [avoidable emergency admissions](#). We did, however, identify several potential contributing factors. Primary and community care factors included: (i) workforce; (ii) case finding and exclusion; (iii) proactive care co-ordination for patients with complex needs; and (iv) access and quality. Commissioning process factors included; (i) data use and incentives; and (ii) targeting of services. Other potential determinants included changes in care home services, national A&E targets, and wider non-care factors such as financial constraints on public services, residential gentrification and shifting health care expectations within the population.

### *Strengths and limitations*

A key strength of our approach was the data-driven identification of case study sites through the triangulation of two data sources [using tests of statistical significance and consistency of trends](#). Our design adds value to the existing literature by focusing on whether recent *changes* in system-wide health care factors led to recent *changes* in inequality. We were aware of the risk of spuriously identifying inequality trends in CCGs that merely experienced transient “data blips” due to random health events and/or measurement artefacts, and therefore several criteria were employed to determine robust and sustained inequality trends. Another strength was our use of an [established](#) realist case

study methodology<sup>yy</sup>[18]-which enabled not only the identification of possible contributing factors, but also the underlying mechanisms.

There were, however, several limitations. First, we were not able to undertake quantitative causal inference analysis to examine the empirical validity of the hypothesised CMOs because of time constraints and access to suitable data. For example, staff reported positive impacts of the “missing thousands” initiative in the late 2000s, as part of the National Health Inequalities Support Team programme, which sought to reduce exception reporting ([the process by which general practices can exclude patients who do not engage from quality-related financial incentives](#)) and improve case finding. However, this was never formally evaluated. Second, time constraints also meant that we were not able to transcribe the interviews and relied on re-listening to the audio to undertake the analysis. Third, due to health service pressures, interviews with some providers were cancelled at short notice reducing the breadth of data gathered. Fourth, we relied on CCG staff to identify suitable informants and although this enabled us to access high-level individuals, some did not have much organisational memory of the local health system and CCG. Fifth, staff recall may have been affected by the reason for selection (improving or worsening inequality trend). Finally, the AGI trends reported in the data packs used 2015 deprivation scores and we therefore do not know the potential impact of changes in deprivation over time.

*Meaning of the findings*

~~Avoidable admissions~~[Avoidable emergency admissions](#) are a long-standing indicator, but data showing the inequality in ~~avoidable admissions~~[avoidable emergency admissions](#) is new

and not yet embedded into health care systems. The AGI indicator has hitherto been a low-profile indicator, one of 58 quality improvement indicators within the CCG Improvement and Assessment Framework (IAF), and the associated data pack drawing attention to this indicator was only disseminated in December 2018. It is therefore not surprising that health systems were not familiar with the indicator or that it has not yet been used to drive improvements. COVID-19 has raised the priority of health inequalities for health care organisations, therefore inequalities indicators may gain greater prominence in driving improvements going forwards.

The seventeen factors that we identified show the complexity and interaction of multiple factors. It is unlikely that any single intervention or activity had led to the reduction, but the interaction of multiple healthcare and non-health care factors.

#### *Comparison with existing literature*

There has not yet been a systematic review specifically focusing on evidence about interventions to reduce inequalities in avoidable hospital admissions, though one is currently underway[19]. However, there have been systematic reviews of interventions to reduce average levels of avoidable hospital admissions, which have highlighted the importance of primary care access, quality and workforce [3,20–24]. Busby and colleagues undertook a review to explore factors that explain geographic variation in [avoidable admissions](#)[avoidable emergency admissions](#). Based on 39 studies, the authors found that variation could be due to primary care quality and this factor was highlighted in our evaluation. Gibson and colleagues (in a review of avoidable admissions for diabetes) found several contributing factors, including workforce and primary care access and quality[22].

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However, Sherringham and colleagues found that primary care quality and workforce were not associated with inequality in [avoidable admissions](#)[avoidable emergency admissions](#) [25].

The differences between Sherringham and colleague’s study and ours may be because Sherringham and colleagues looked at the average effect across all areas of England, whereas the areas we explored may have had particular contextual challenges. Therefore, it may not be poor quality primary care by itself, but rather the interaction of poor quality with other factors such as barriers to access, workforce shortages, weak community assets and/or changing demographics which leads to the widening of inequalities. Our study did not identify other factors mentioned in previous literature reviews focused on average avoidable emergency admissions levels, such as Comprehensive Geriatric Assessment, vaccination or emergency care practitioners[26–28]. This may be because these are not as relevant to the local areas we evaluated or were not commissioned by the CCGs. It may also be because previous reviews have focused on interventions to address avoidable emergency admissions per se, rather than interventions to address *inequalities* in avoidable emergency admissions.

*Implications for policy*

There are no cheap and simple “magic bullet” interventions guaranteed to reduce inequality in [avoidable admissions](#)[avoidable emergency admissions](#). Instead sustained, large-scale interventions across the health system are likely to be required that are tailored to specific local population needs. Promising approaches include strengthening primary care in deprived areas by: (i) ensuring adequate workforce, quality, access and continuity; (ii) promoting engagement with primary care services through case finding and reducing

exception reporting; and (iii) improving adherence to effective treatments for chronic diseases and community infrastructures.

Proactive models of care for patients with complex health and social needs should be considered, such as the Focused Care programme of integrated primary care and welfare services[29]. Health systems should target resources, especially primary care services, to neighbourhoods with the greatest needs rather than universal offers being made to all neighbourhoods[30]. [With the NHS facing increasingly limited resources, driven by higher use and costs of healthcare, there is a moral imperative to ensure that scarce resources are distributed in an equitable fashion and for inequalities to be a high priority in every local health care system.](#)

### *Implications for future research*

Several of the factors we identified could be explored further in quantitative studies using administrative data linked at individual, neighbourhood or practice level, including both quasi-experimental intervention effectiveness studies and causal pathway modelling studies. For example, exploring the association between the AGI measure and access to general practice, workforce, quality of primary care, A&E targets, universal credit and exception reporting. Since the determinants of change in emergency admission inequality are complex, it would be preferable to explore several different factors within the same analysis to allow for confounding, mediating and moderating influences and to compare the importance of different factors. Our findings could be extended by further case studies with more bespoke local data analyses, wide-ranging interviews and documentary analysis, new

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case studies in different areas, and a more systematic review of evidence on effective interventions for reducing inequality in emergency admissions.

*Conclusions*

We could not find any single service or initiative that explained the trends in inequality in ~~avoidable admissions~~avoidable emergency admissions. Rather, the trends are more likely due to an interplay of multiple competing or compounding healthcare and wider system factors. The contributing factors we identified mainly focused on primary care and commissioning, and to a lesser extent care home services, national A&E targets, and wider non-healthcare factors. Local decision makers need greater awareness, understanding and support to interpret and use inequality indicators.

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Table 1: Number of discussions conducted at each case study site

Chosen case study site	Commissioner representatives discussions	Provider representative discussions	Total number of individuals spoken to
Pilot CCG	6 representatives (over 6 meetings)	3 representatives (over 3 meetings)	9
CCG A-Improving	5 representatives (over 5 meetings)	Nil – no response from providers	5
CCG B-Improving	6 representatives (over 3 meetings)	2 representatives (over 2 meetings)	8
CCG C-Mixed	5 representatives (over 5 meetings)	Nil- cancelled by provider	5
CCG D-Worsening	6 representatives (over 5 meetings)	2 representatives (over 2 meetings)	8
CCG E-Worsening	8 representatives (over 7 meetings)	2 representatives (over 2 meetings)	10

*Table 2: Context-mechanism-outcome configurations relating to direct factors that influence inequality in emergency admissions listed by theme*

	<b>Context</b>	<b>Mechanism</b>	<b>Outcome</b>	<b>Case study site(s) that can provide example of this</b>
<b>Design and delivery of primary care and community services</b>				
1	Worsening primary care accessibility and quality	Unmet need and inability to manage complex cases in the community disproportionately affecting disadvantaged patients	Worsening inequality in A&E attendances and admissions	CCG E- Worsening CCG C-Mixed
2	Low exception reporting and case finding of hard to engage patients	Improved engagement with primary care	Improving quality of care and increased likelihood of accessing primary care earlier and during acute deterioration	CCG C-Mixed
3	Focused pro-active care in practices in disadvantaged areas	Improved prevention, health literacy, self-management and community development	Health problems more likely to be addressed earlier and in the community	CCG C-Mixed
4	Dedicated workforce targeted at disadvantaged communities	Support with health and wider social issues	Increasing likelihood of managing acute conditions in the community	CCG C-Mixed
5	Reducing primary and community workforce in disadvantaged areas	Reduced capability and capacity to deal with acute deteriorations in disadvantaged areas	Increasing inequality in admissions	CCG E- Worsening Pilot CCG
6	High proportion of GPs retiring in deprived areas who are either not replaced or replaced by younger doctors or allied	Loss of experience, senior leadership in region and new staff less willing to tolerate risk	Increased likelihood of onward referral to hospital of	CCG D- Worsening

	health professionals		acute patients	
7	Increasing use of short-term locums in disadvantaged areas	Reduced knowledge of patients and continuity of care	Reducing likelihood of managing patients in the community	CCG D-Worsening CCG E-Worsening
8	Cultural and language barriers coupled with reduce consultation capacity	Increased uncertainty of diagnosis	Increasing likelihood of short admissions for investigations to rule out disease	CCG E-Worsening
9	Merger of primary care practices in under-served areas and GP contracts that support under-doctored areas	Increased investment and sustainability of primary care in deprived area	Improving access to primary care in deprived areas	CCG B-Improving CCG C-Mixed
Key performance indicators in secondary care settings				
10	Challenging high profile A&E targets	Fear of missing targets	Increasing likelihood of admitting patients with complex health or social needs	CCG E-Worsening CCG C-Mixed
Care homes				
11	Increasing services in care homes which are predominantly in disadvantaged areas	Preventative and anticipatory care	Reducing admissions from care homes	CCG C-Mixed CCG A-Improving
Oversight and process of commissioning local health services				
12	Provision of bespoke health data to GP for comparison	Peer pressure	Improving performance of worst performing practices and reduced likelihood of secondary care use	CCG B-Improving
13	Re-prioritisation of financial incentives to support struggling primary and community care	Dis-incentivisation of secondary care and improved engagement with primary and community care	Reducing secondary care attendances and admissions	CCG B-Improving
14	Access to and desire to	Improved	Increasing	CCG B-

	use data within commissioning organisation	understanding of local population	ability to target services to areas of highest need and inequality	Improving CCG A-Improving
<b>Socio-economic, cultural and environmental changes in the local area</b>				
15	Local area becoming more affluent or disadvantaged	Changing health care need of local population	Changing secondary care use	CCG A-Improving CCG C-Mixed CCG E-Worsening
16	Financial constraints of public services coupled with universal credit	Worsening community resilience and income deprivation	Reducing health and ability to manage increased need in the community	CCG C-Mixed
17	Different experience and expectations of the health care system	Confusion and reduced health literacy	Increasing likelihood of attendance at A&E and subsequent admission	CCG E-Worsening Pilot CCG

**Supplementary Material 1: Questions guiding the CCG discussions**

**Questions for CCG case study discussions**

**Pre-amble**

- Introductions
- Broad overview of our project
- Broad overview of the meeting
  - o Broad CCG questions
  - o Explaining the RightCare data
  - o explaining focus on health inequalities related to ambulatory care sensitive conditions
  - o Discussion about the data
- Outline of their role within the CCG

**Questions:**

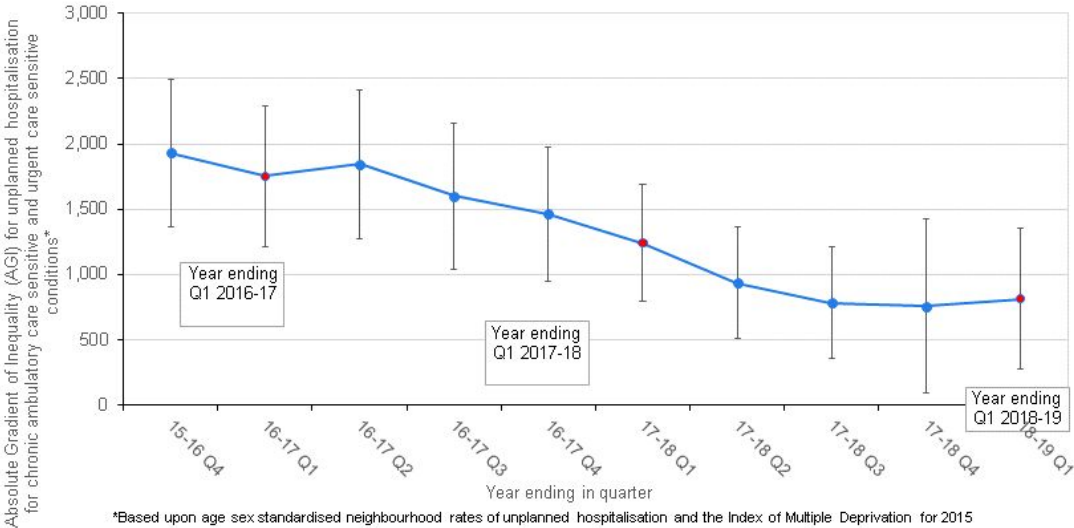
- Introductory questions
  - o To what extent are health inequalities a priority within the CCG and your own work?
  - o To what extent do you think the CCG can reduce health inequalities and why?
  - o Thinking about the past 3 to 5 years at the CCG, what have been the significant changes or issues?
    - Probe
      - Why have these occurred? What have been the drivers for these changes?
      - Any data to back up opinions?
  - o What health system factors do you think effect emergency admissions?
    - Probe
      - Why?
      - Any data?
      - leadership and governance (e.g. strong, weak etc.)
      - financing (e.g. any additional funds used to prevent admissions, lack of funds)
      - workforce (e.g. known gaps in health workforce in primary or secondary care, sickness absence- leading causes etc.)
      - information systems (how do CCG leads know about impact of risk factors for health inequalities on emergency admissions- is this recorded? reported? reviewed?)
      - service/ programme delivery (any special developments or problems?)
      - access to essential medicines (e.g. role of other services to prevent hospital admissions for examples “Healthy Living pharmacies”, GP at weekend etc)

- Specifically considering emergency admissions, what has changed over the past 3 to 5 years which might have influenced admission rates?
  - Why have these occurred? What have been the drivers for these changes?
  - Any data?
- What are the main health inequalities relevant to your role?
  - Probe – why?
- What factors may have affected health inequalities within Cambridgeshire and Peterborough over the past 3 to 5 years?
  - Probe – why?
- Have you been involved in any health inequalities projects over the past 3 to 5 years, if so, what were they?
  - Probe – what was the reasoning behind it? Why might this reduce health inequalities?
- RightCare data
  - Quick talk through the RightCare data packs
  - Looking at p21 (trend of AGI)
    - What do you think might explain this trend?
  - Looking at p22
    - Why do you think that some deprived areas such as XX have a lower rate of unplanned admissions compared to similar areas?
  - Looking at p23 and p25
    - Is there anything that surprises you about the priority wards or conditions?
  - Looking at the protected characteristics graphs
    - What do you think is causing XX to be associated with higher admissions?
- Concluding questions
  - What do you think the CCG could be doing differently to reduce health inequalities?
    - Probe – why?
  - Is there anything you think other CCGs could learn from Cambridgeshire and Peterborough?
    - Probe – why?

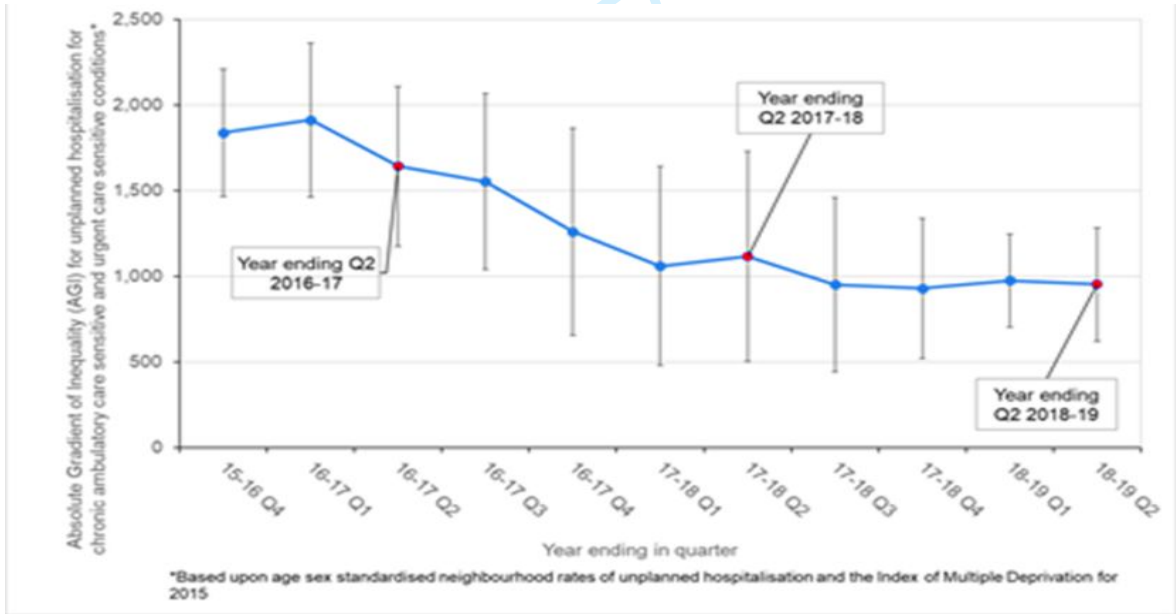
Supplementary Material 2: Trends of case study sites

Improving CCGs

CCG A-Improving

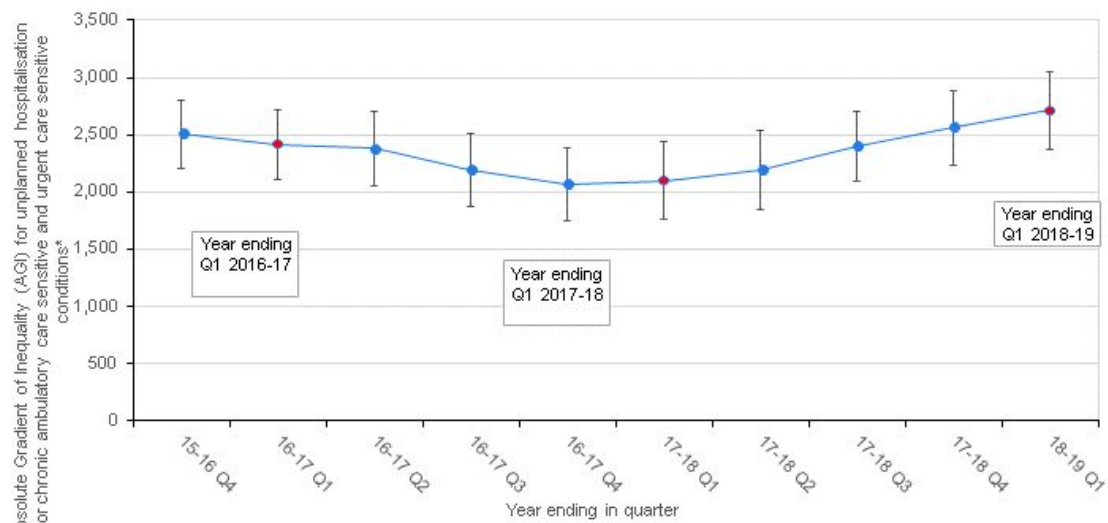


CCG B-Improving



## Improving then worsening

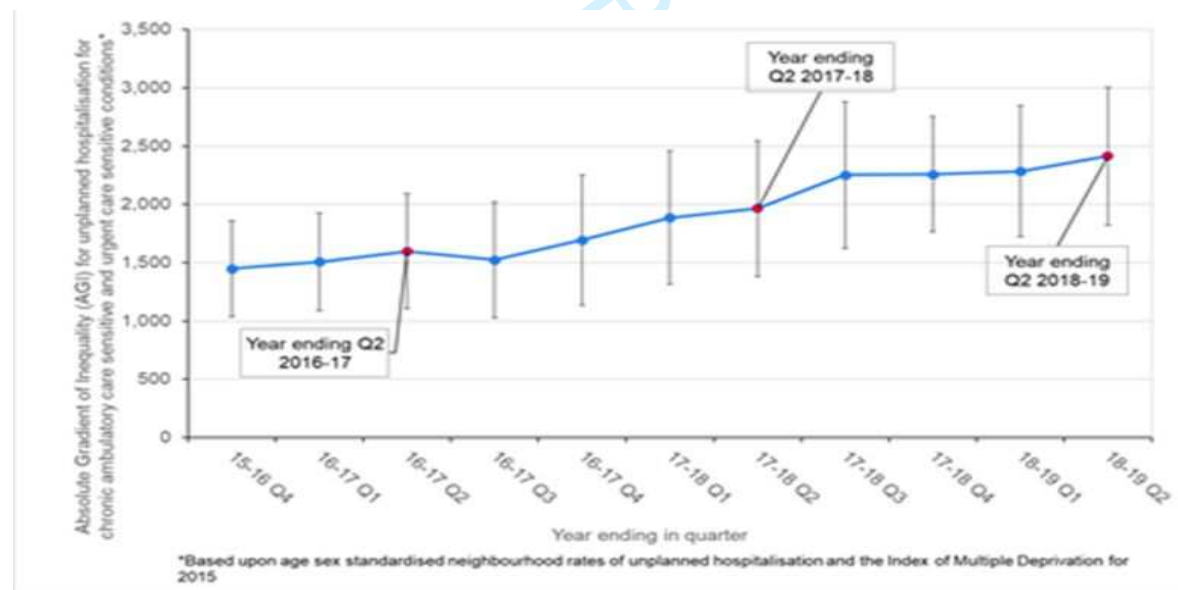
### CCG C-Mixed



\*Based upon age sex standardised neighbourhood rates of unplanned hospitalisation and the Index of Multiple Deprivation for 2015

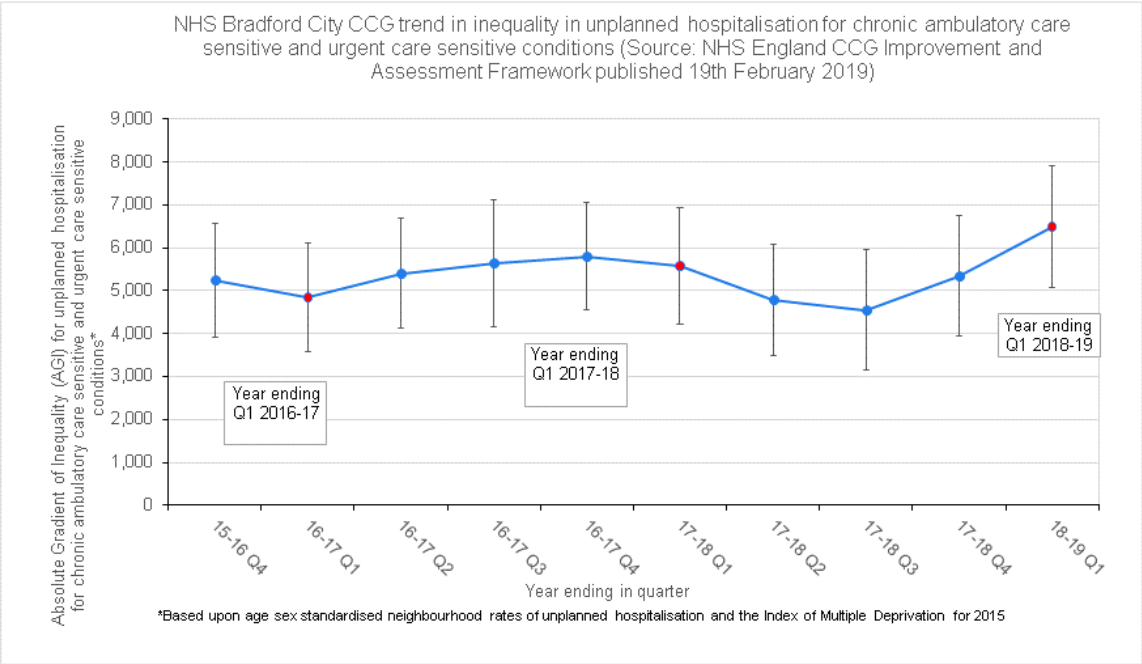
## Worsening

### CCG D-Worsening



\*Based upon age sex standardised neighbourhood rates of unplanned hospitalisation and the Index of Multiple Deprivation for 2015

CCG E-Worsening



N.B. Initial assessment of CCG E-Worsening showed apparent worsening, but subsequent analysis suggests the trend may be unreliable due to exceptionally narrow socio-economic variation and small population size

### **Supplementary Material 3: Overview of case study sites- key information about each CCG and trends in AGI**

The graphs all use recently updated University of York data at CCG level. This provides a longer and more up-to-date time series than was available at the time of case study site selection.

#### **Pilot CCG**

*Figure 1: Time series for AGI score for any avoidable admissions, Pilot CCG*

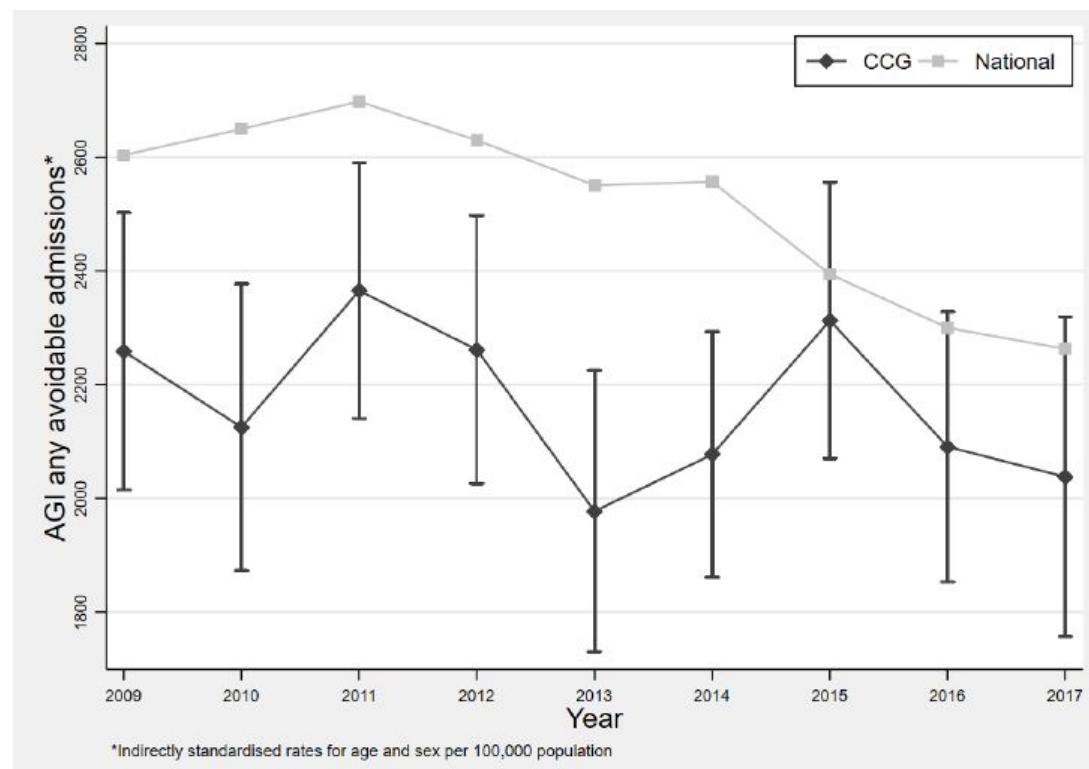
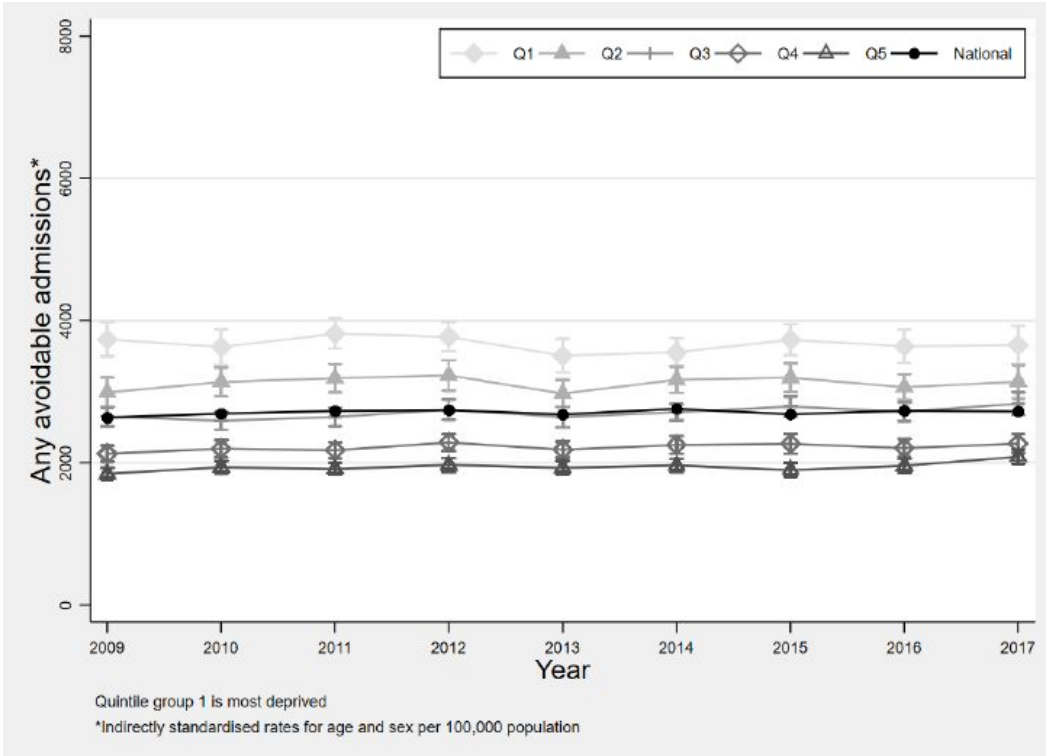


Figure 2: Time series for avoidable admissions by quintile of deprivation, Pilot CCG



CCG A-Improving

Figure 3: Time series for AGI score for any avoidable admissions, CCG A-Improving

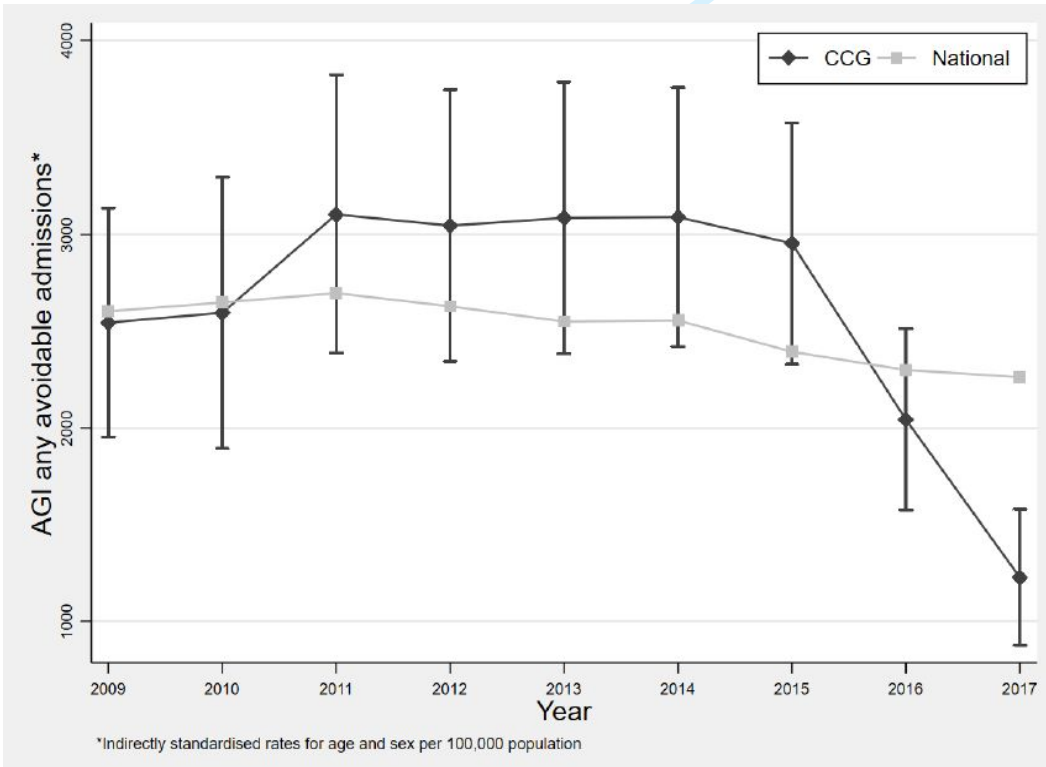
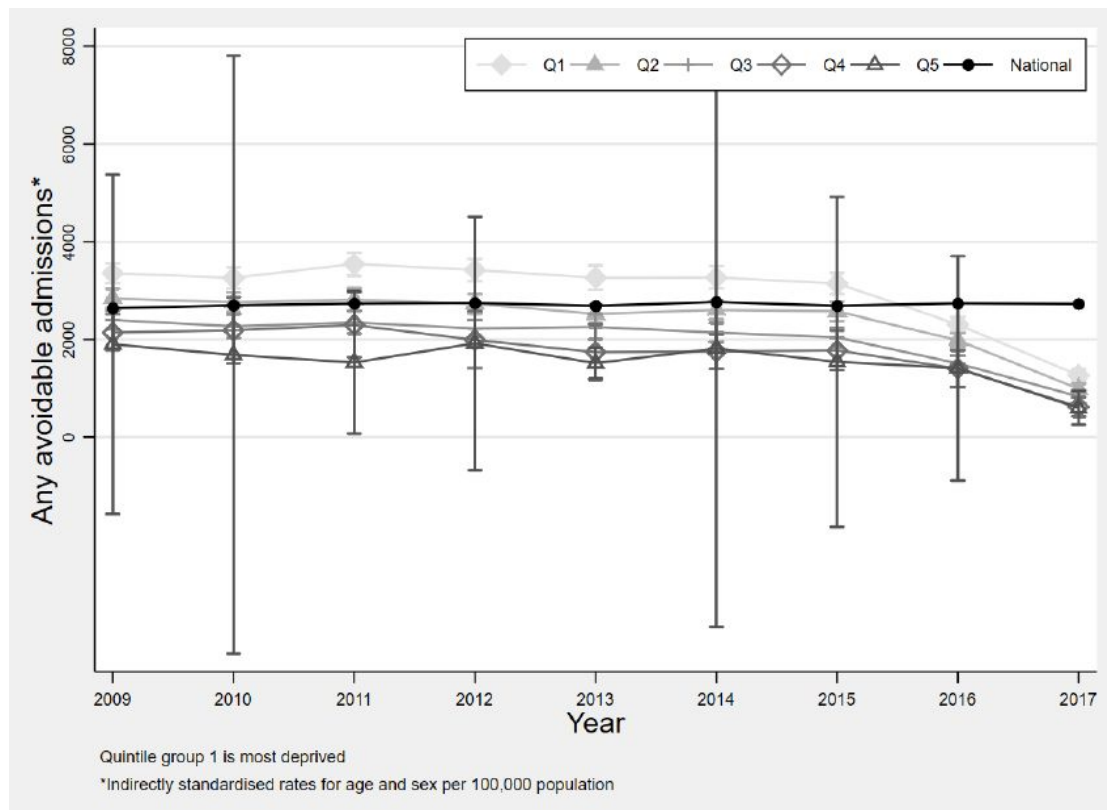


Figure 4: Time series for any avoidable admissions by quintile of deprivation, CCG A-Improving



CCG B-Improving

Figure 5: Time series for AGI score for any avoidable admissions, CCG B-Improving

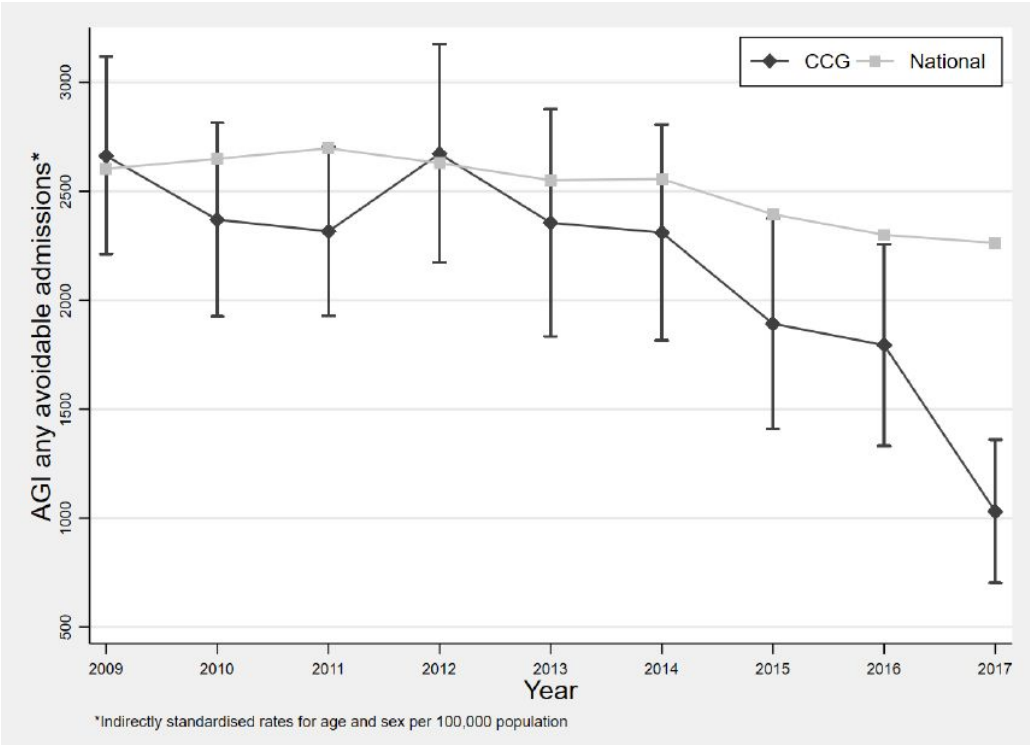
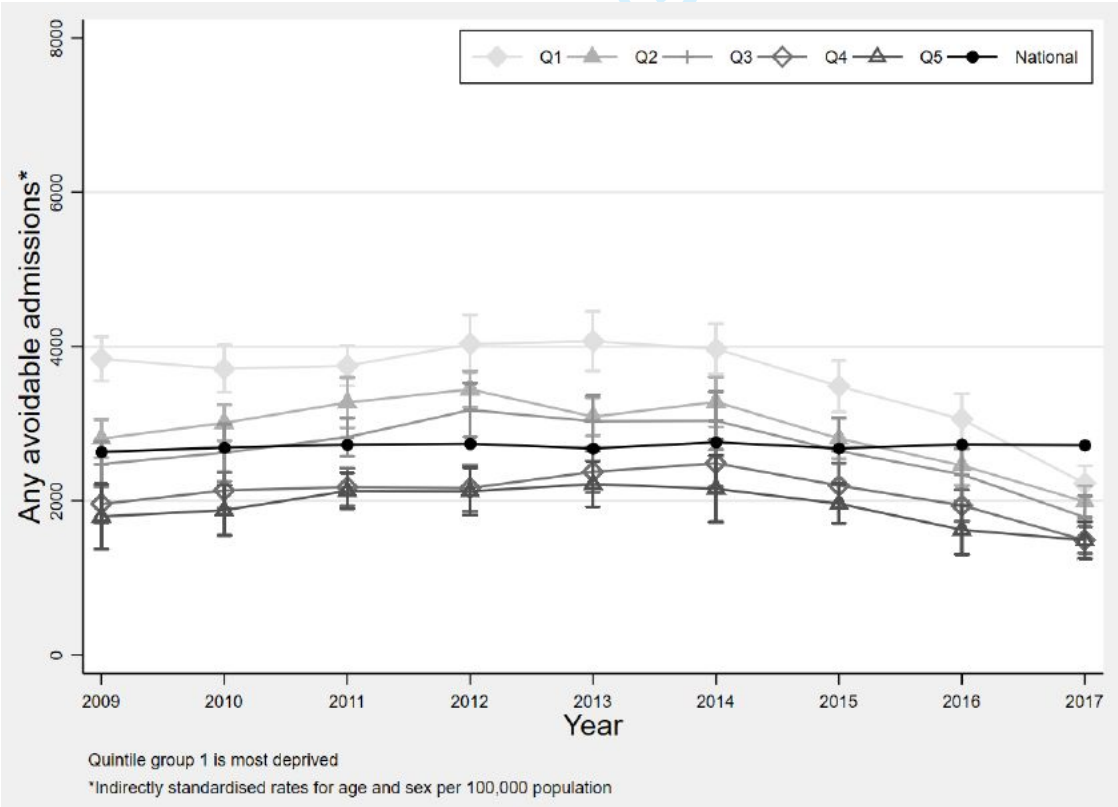
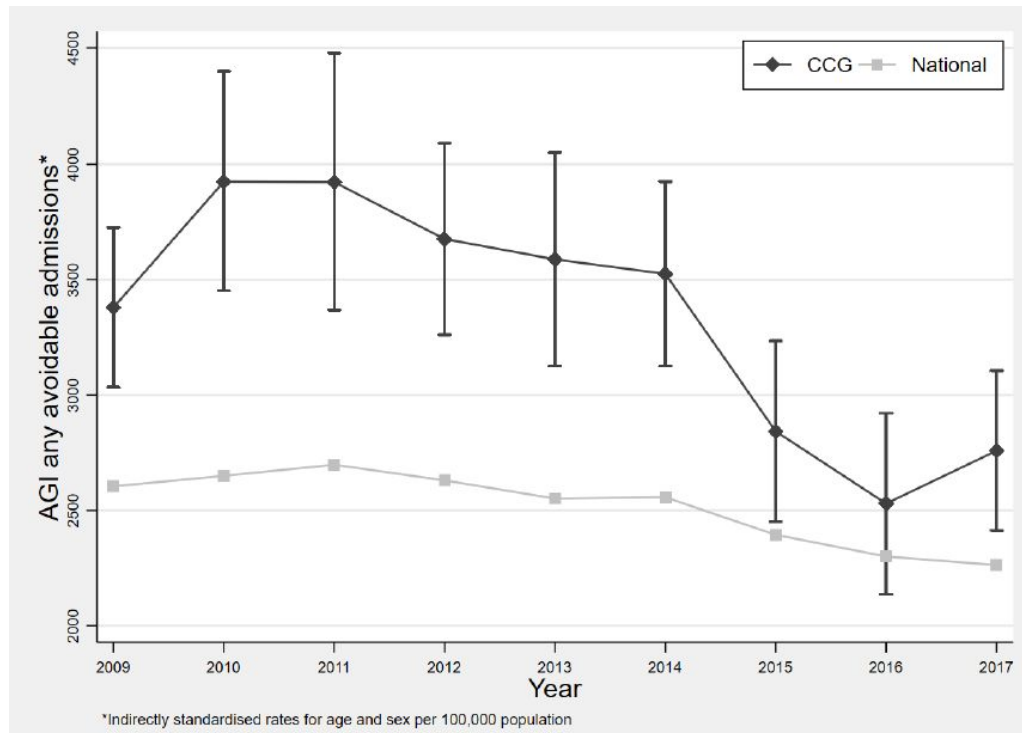
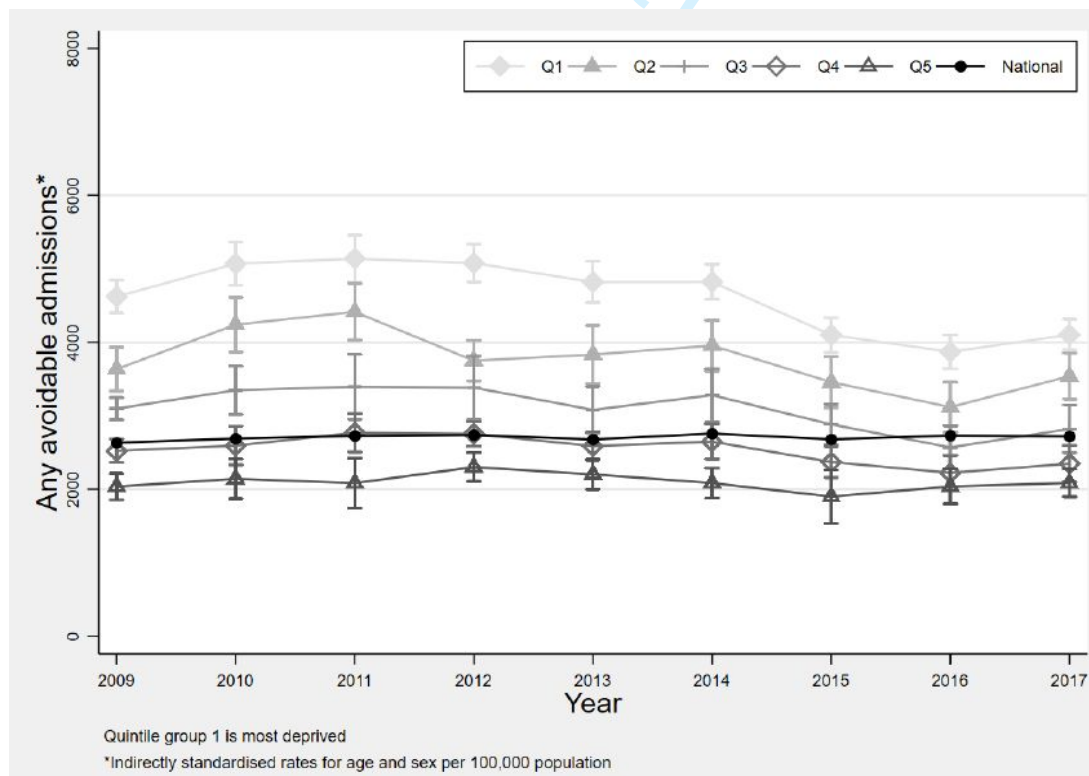


Figure 6: Time series for any avoidable admissions by quintile of deprivation, CCG B-Improving



**CCG C-Mixed***Figure 7: Time series for AGI score for any avoidable admissions, CCG C-Mixed**Figure 8: Time series for any avoidable admissions by quintile of deprivation, CCG C-Mixed*

CCG D-Worsening

Figure 9: Time series for AGI score for any avoidable admissions, CCG D-Worsening

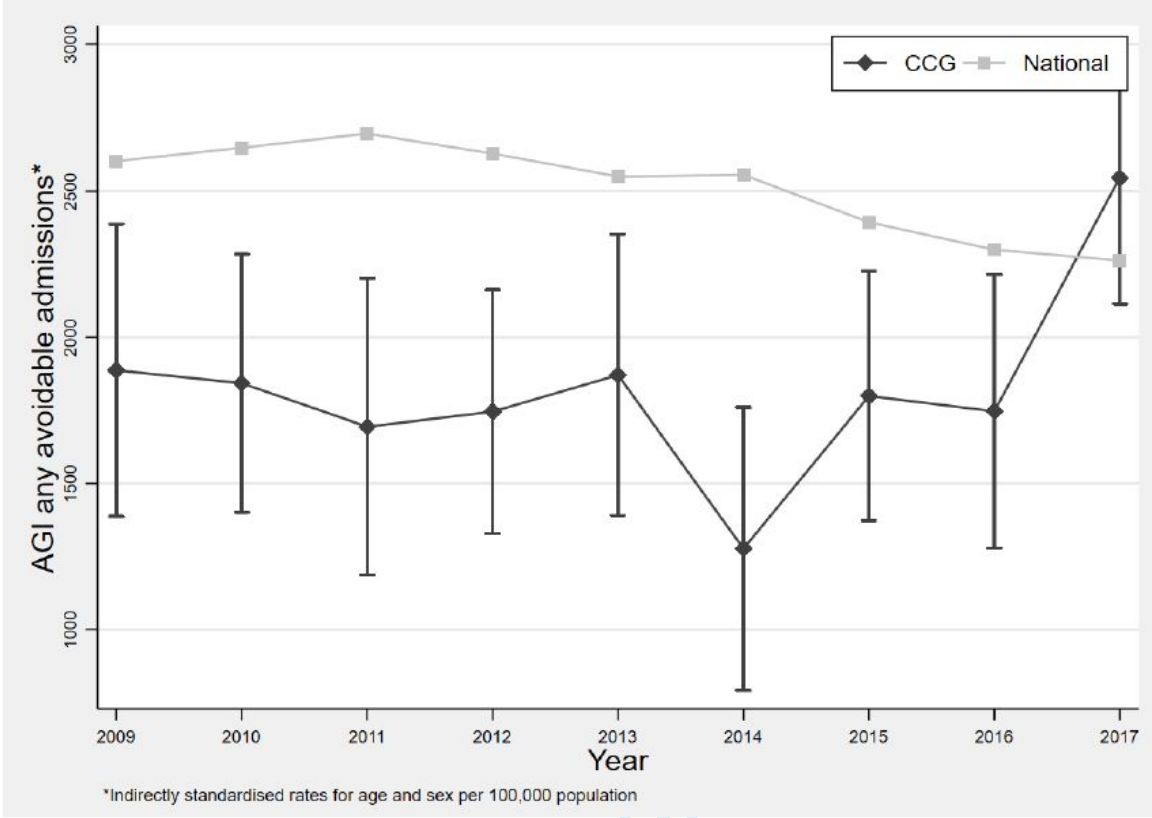


Figure 10: Time series for any avoidable admissions by quintile of deprivation, CCG D-Worsening

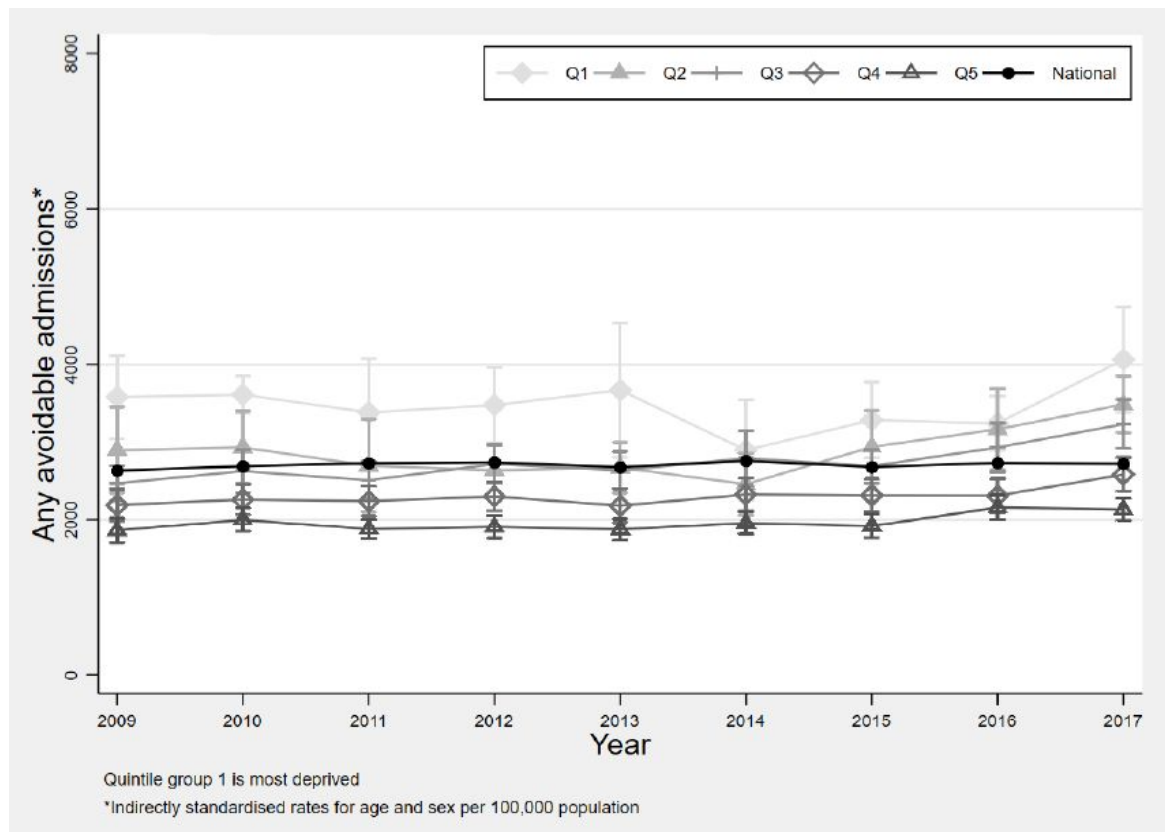


Figure 11: Time series for AGI score for any avoidable admissions, Southend

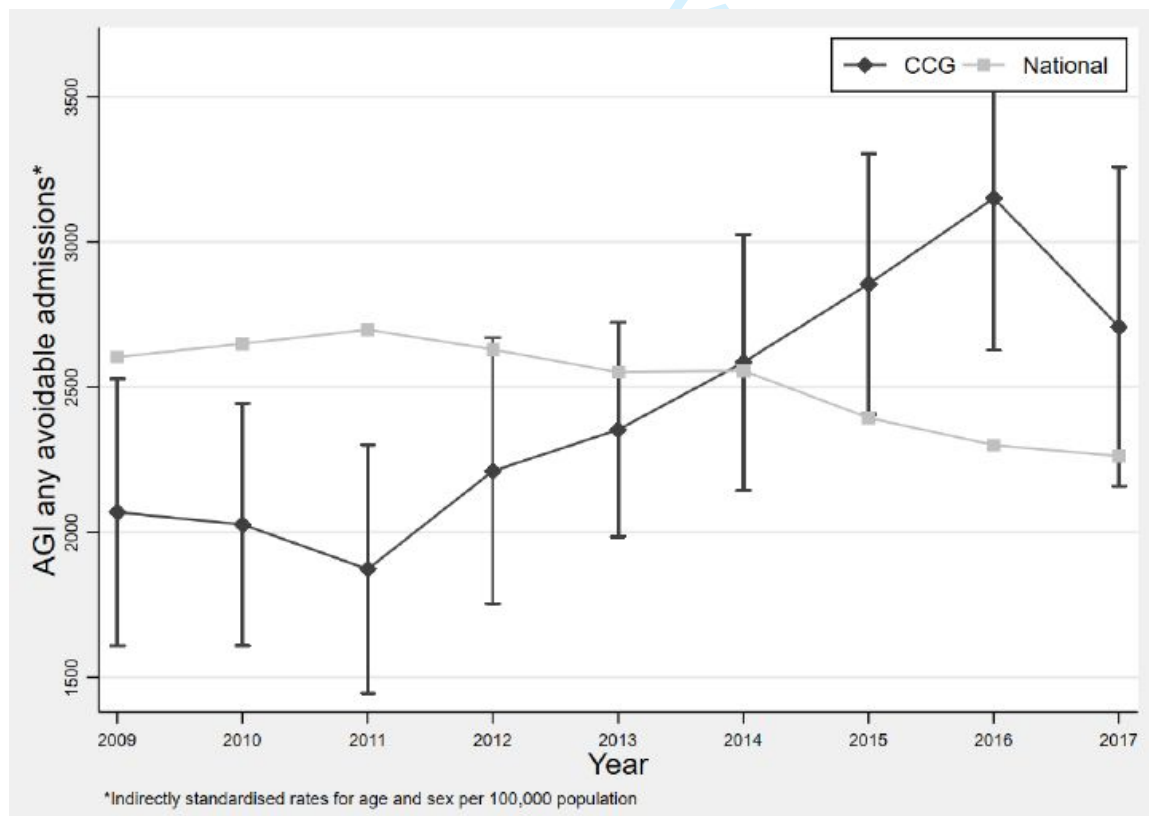
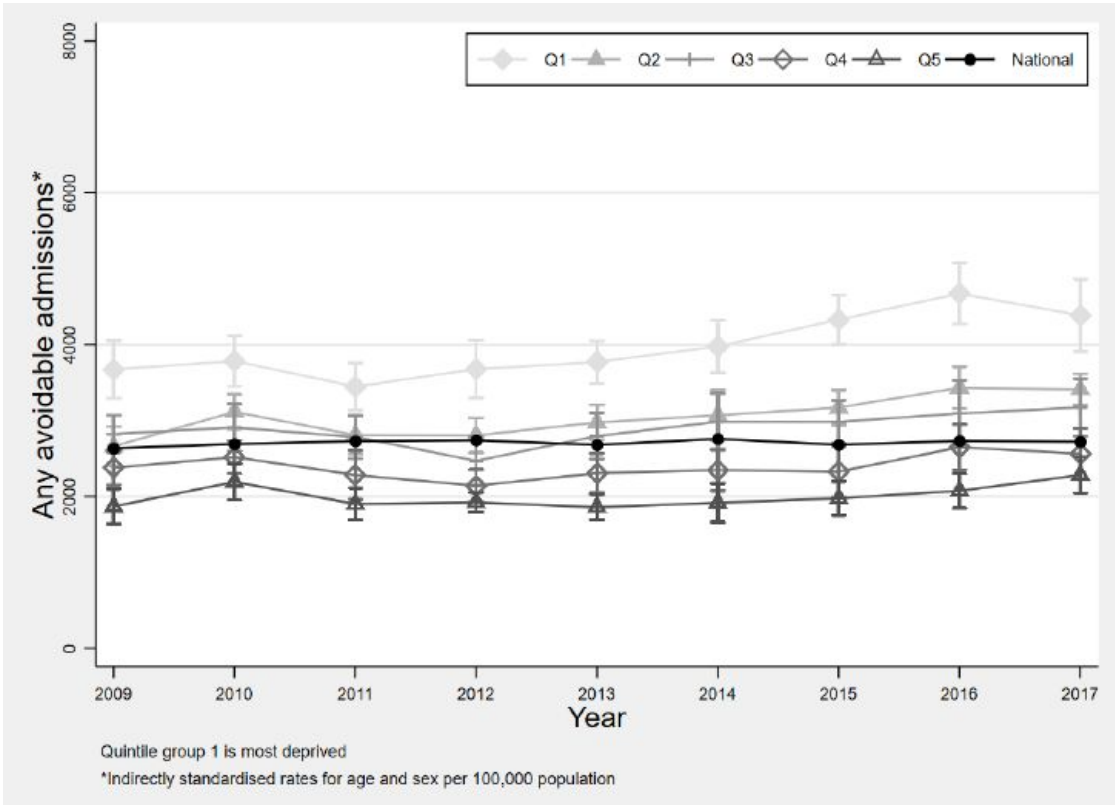


Figure 12: Time series for any avoidable admissions by quintile of deprivation, Southend



CCG E-Worsening

Figure 13: Time series for AGI score for any avoidable admissions, CCG E-Worsening

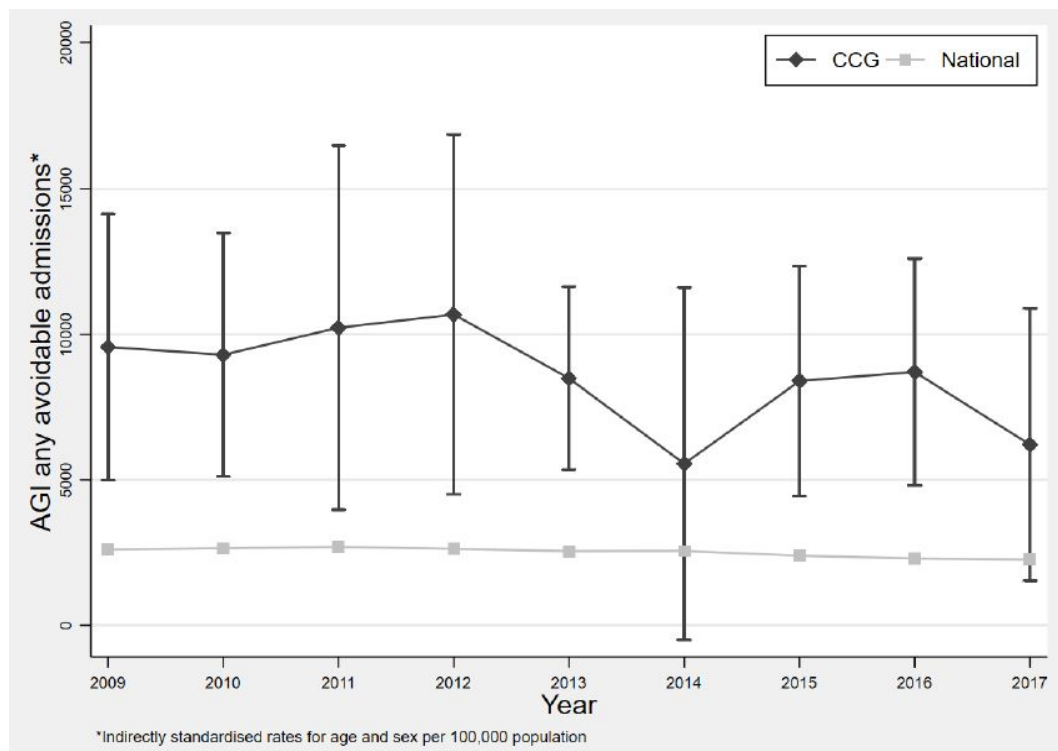
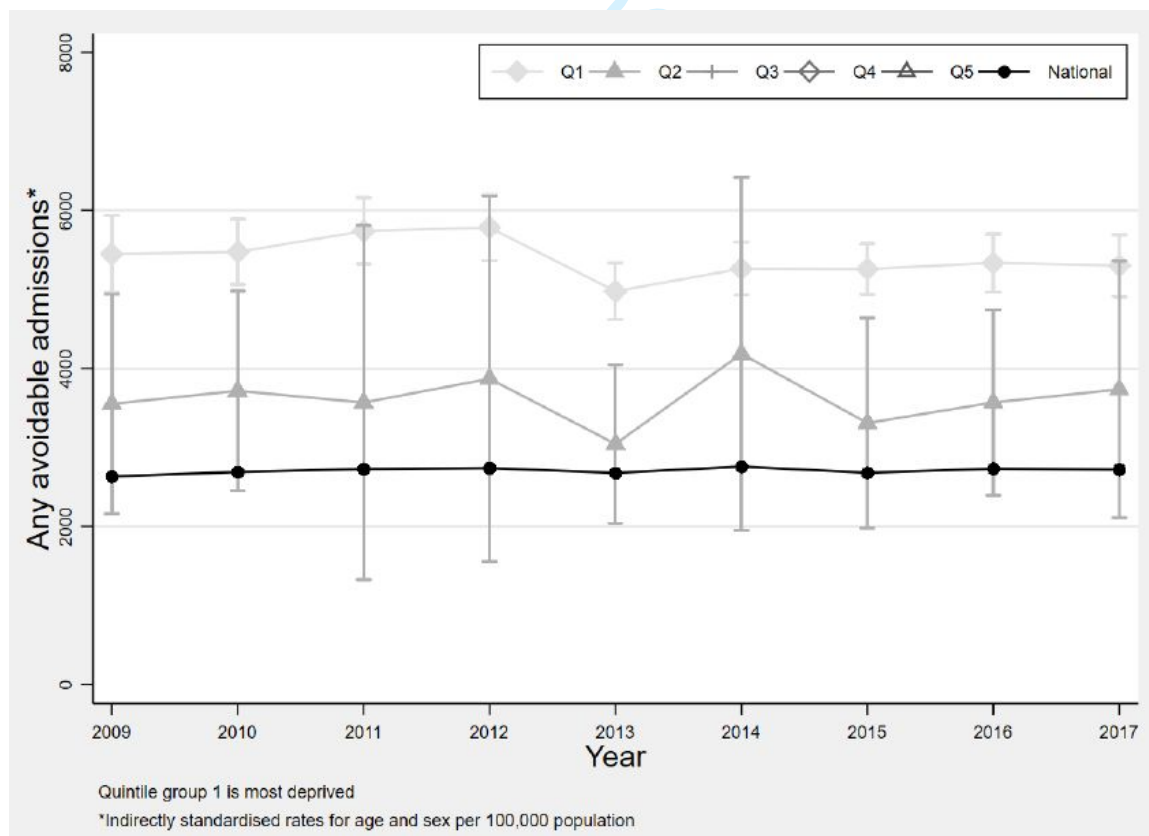


Figure 14: Time series for any avoidable admissions by quintile of deprivation, CCG E-Worsening



**Supplementary Material 4: Overall programme theory diagram showing factors that influence inequality in avoidable emergency admissions**

