Equality and Health Inequalities (EHI) RightCare Pack Methodology Guide

NHS England, Data Analysis Intelligence Service18/12/2018

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Contents

Introduction

The aim of this guide is to explain the methodologies behind the analytical slides in the EHI RightCare pack, so that the analysis could be independently replicated. It presents each analytical slide and describes and explains the methodology behind it.

The guide covers analysis of equality and health inequalities for:

- Unplanned Hospitalisations for Chronic Ambulatory Care Sensitive Conditions and Urgent Care Sensitive Conditions (IAF indicator 106a)
- Psychological Therapy Referral Rates and Recovery Rates through the Improving Access to Psychological Therapies (IAPT) Programme

Annex A at the end contains further details about the following:

- Indirect standardisation
- Confidence intervals
- Statistical significance
- Savings opportunity and improvement opportunity calculations
- Further detail on IAPT calculations
- Suppression of small numbers to protect patient confidentiality
- Ethnic groups
- Negative Absolute Gradients of Inequality
- Revisions to Secondary Uses Service data

Acknowledgement of the contributions of stakeholders' to the development of these Equality and Health Inequalities RightCare packs

We would especially like to thank Clinical Commissioning Groups (CCGs) for their help developing and testing these packs. In particular, we would like to thank; Newham, Bromley, Somerset and Dorset for reviewing and discussing various versions of their packs with us.

We would like to thank Professors Chris Bentley (Health Inequalities National Support Team Associate) and Richard Cookson of York University for their regular inputs during the development of these packs. In particular, we would like to thank them for their time reviewing successive iterations, engaging with CCGs and making suggestions for both developing the analyses and for making them more accessible to CCGs.

We would like to thank Public Health England and Department of Health and Social Care analysts for discussing a sample pack and for making suggestion for improving the analyses within it.

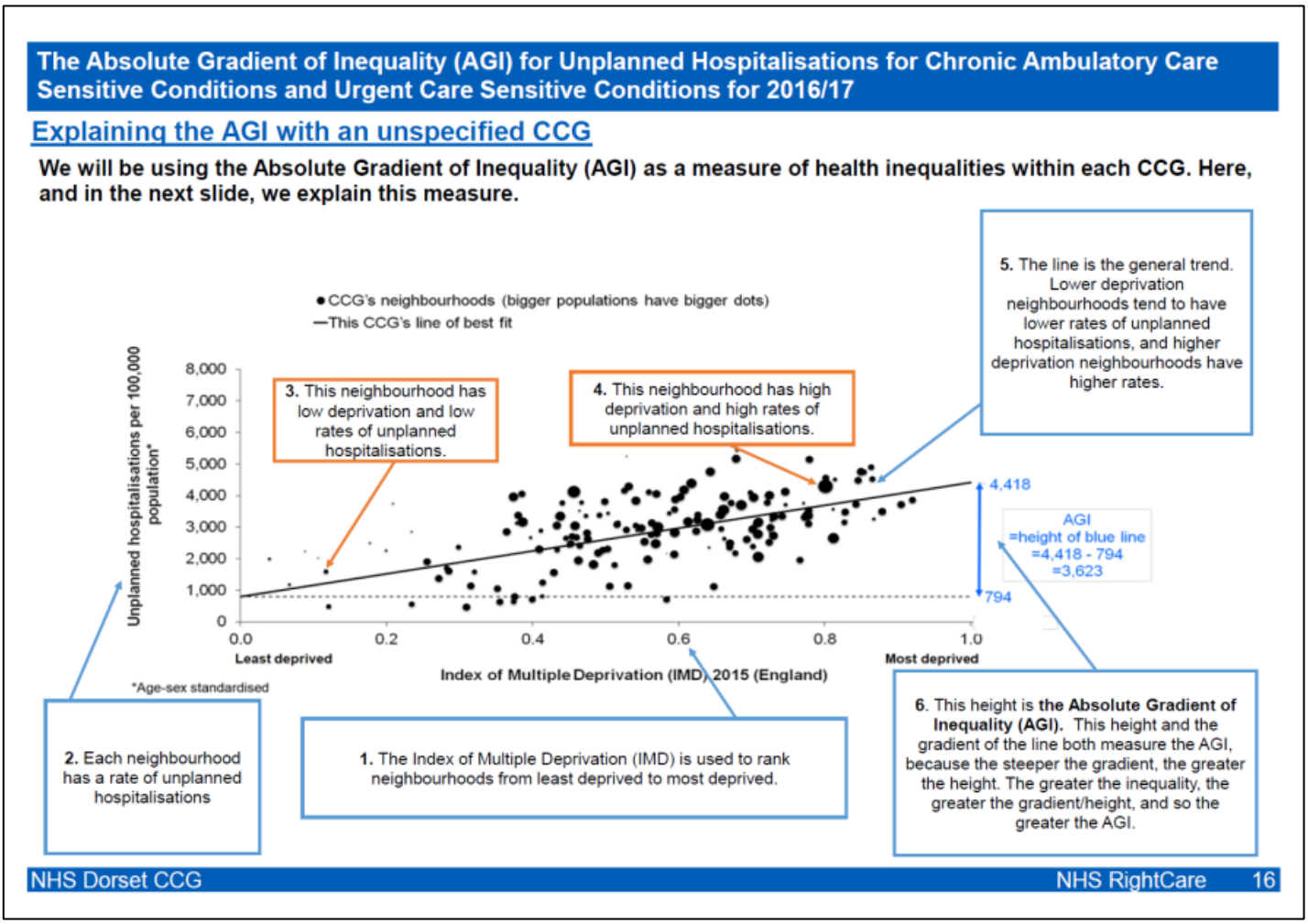
We would like to thank the many colleagues across NHS England for their help developing these packs including the Equalities and Health Inequalities Unit, NHS England analysts, directors across business priorities and National Clinical Directors.

EHI in Unplanned Hospitalisations for Chronic Ambulatory Care Sensitive Conditions and Urgent Care Sensitive Conditions

The section is about EHI in relation to the CCG Improvement and Assessment Framework (IAF) indicator 106a: ***inequality in unplanned hospitalisation for chronic ambulatory care sensitive and urgent care sensitive conditions***[1].

The slides explaining the Absolute Gradient of Inequality (AGI)

The Absolute Gradient of Inequality (AGI) is the metric used in the IAF to measure inequality within a CCG. This is explained for an unspecified CCG in the slide below.

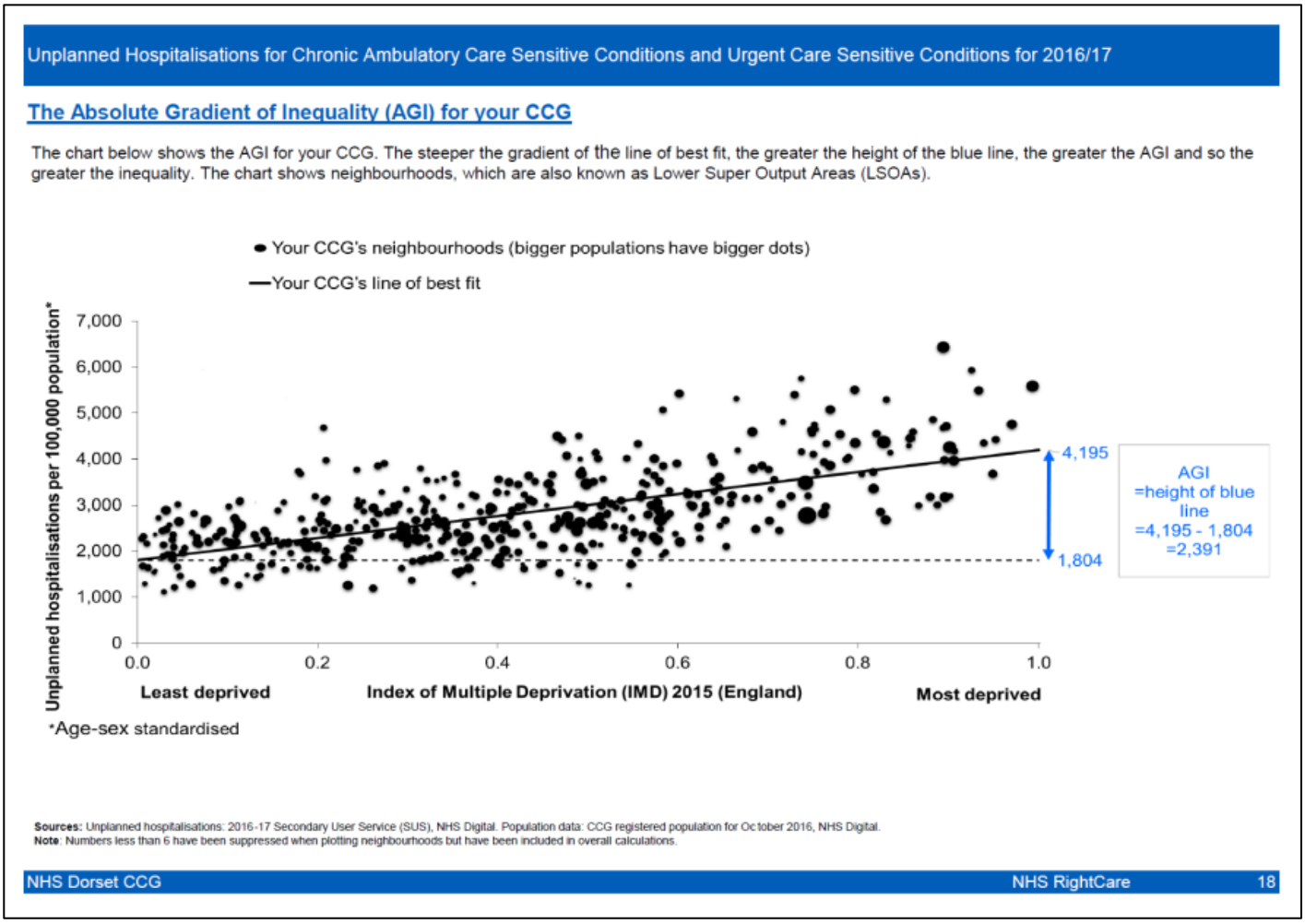


The pack contains a further slide (not shown here) comparing unspecified CCGs with high and low inequality.

[1]For details of 106a construction see https://www.england.nhs.uk/wp-content/uploads/2017/11/ccg-technical-annex-2017-18-v1-1.pdf p (14-17). Latest data can be found at https://www.england.nhs.uk/ccg-iaf-indicators/

The slide showing the CCG's AGI

This slide shows the AGI for the CCG (***Dorset in the slide below***). Published data for 2016/17 financial year[1] are shown by the figures in blue. The bubble chart shows indirectly age sex standardised rates of unplanned hospitalisations per 100,000 population (vertical axis) at neighbourhood (Lower Super Output Area (LSOA)) level, against the Index of Multiple Deprivation[2] (IMD) 2015 measured on a zero to one scale (horizontal axis). Using the deprivation rank, the most deprived LSOA (ranked 1) is given a value of one, and the least deprived LSOA (ranked 32,844) is given a value of zero. For other LSOAs, prorating between 0 and 1 based upon rank is used. For rates of unplanned hospitalisations per 100,000 population, the numerator is LSOA indirectly age sex standardised hospitalisations *100,000, and the denominator is LSOA CCG registered population. Data at this level are unpublished and, in line with patient confidentiality protocol, only neighbourhoods with more than 6 hospitalisations are shown. The size of each bubble reflects the population size of the LSOA it represents. The line of best fit is based upon population weighted least squares regression. Patients registered in one CCG may come from an LSOA that is geographically a constituent of another CCG. LSOA geographic boundaries may also overlap CCG boundaries. For these reasons some of the bubbles on the chart may represent part LSOAs.

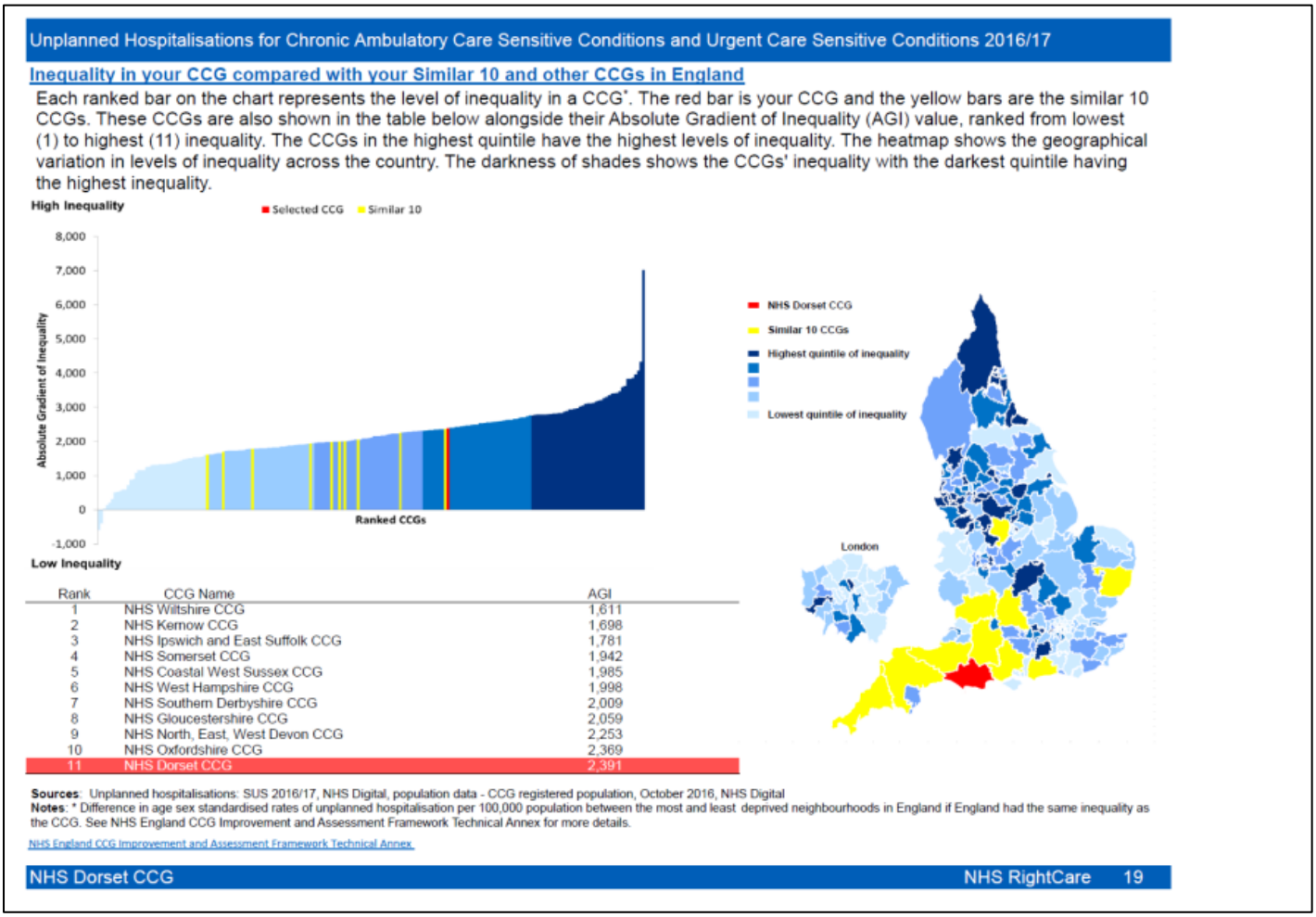


[2] For IMD 2015 see https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015

The slide comparing the CCG's IAF inequality indicator with 207 CCGs in England

This slide compares published IAF ***inequality in unplanned hospitalisation for chronic ambulatory care sensitive and urgent care sensitive conditions as measured using the Absolute Gradient of Inequality*** (indicator 106a) data for 207 CCGs in England[1]**.**

The ranked bar chart and map shows the 207 CCGs in England with quintiles in different shades of blue. The CCG is shaded red. The RightCare Similar 10 CCGs for the CCG are shaded yellow[3]. The table below the bar chart ranks the selected CCG (red background) with its Similar 10 CCGs from lowest inequality (top) to highest inequality (bottom).

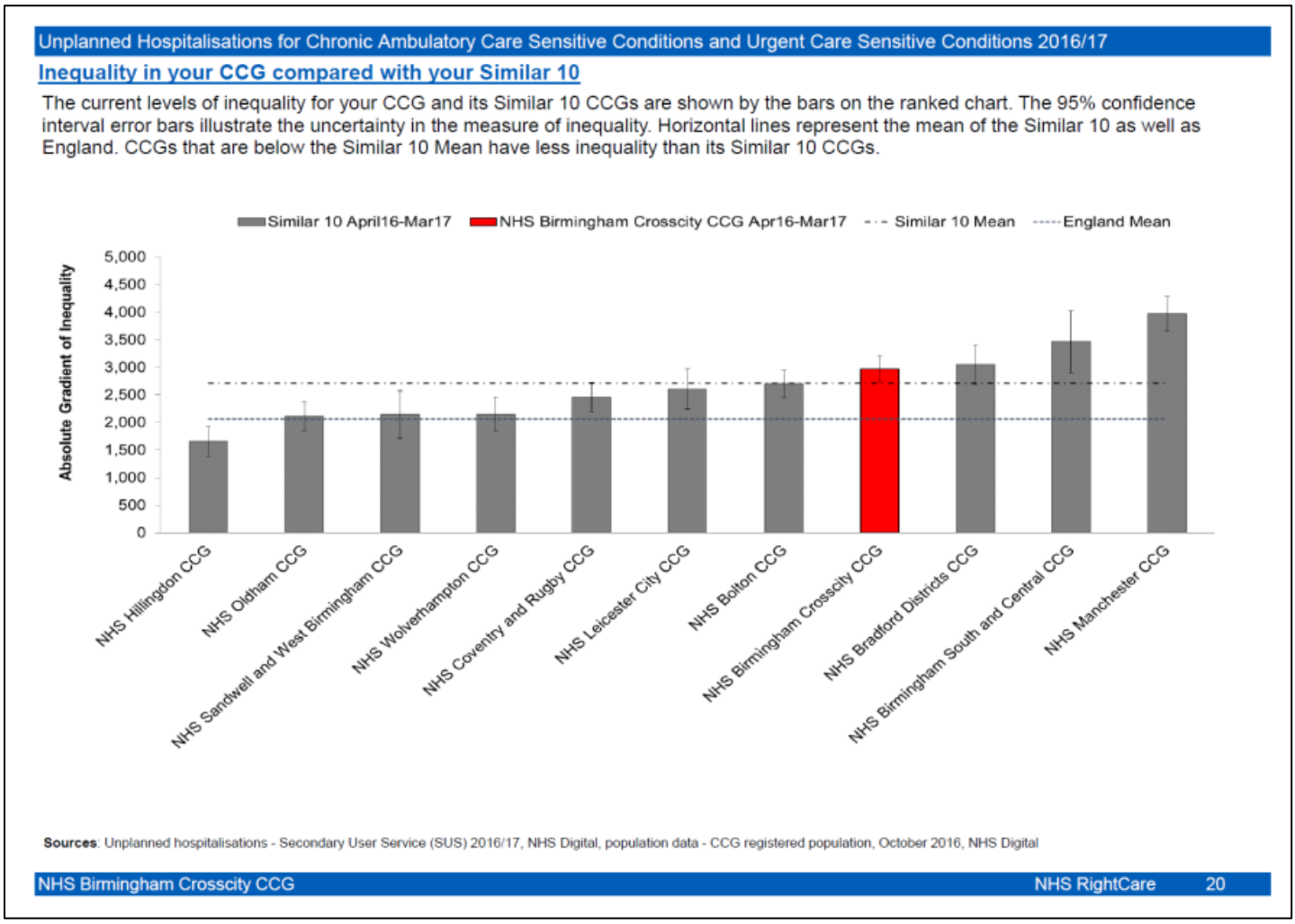


[3] For the RightCare Similar 10 including methodology see https://www.england.nhs.uk/rightcare/wp-content/uploads/sites/40/2018/03/similar-10-explorer-tool-ccg-version.xlsm

The slide comparing the CCG's IAF inequality indicator with those of its RightCare Similar 10 CCGs

This slide shows a ranked bar chart of published IAF ***inequality in unplanned hospitalisation for chronic ambulatory care sensitive and urgent care sensitive conditions as measured using the Absolute Gradient of Inequality*** (indicator 106a)[1] for the CCG and its Similar 10 from lowest inequality (left) to highest inequality (right).

The black dash and dot line shows the unpublished population weighted average AGI for the CCG's Similar 10 and the dashed blue line shows the published AGI figure for England. Confidence intervals for each CCG are based upon published standard errors[4] ***for the coefficient on the rank of IMD in the weighted least squares regression analysis*** multiplied by 1.96 (the z value for 95% confidence intervals assuming a Normal Distribution)***.***

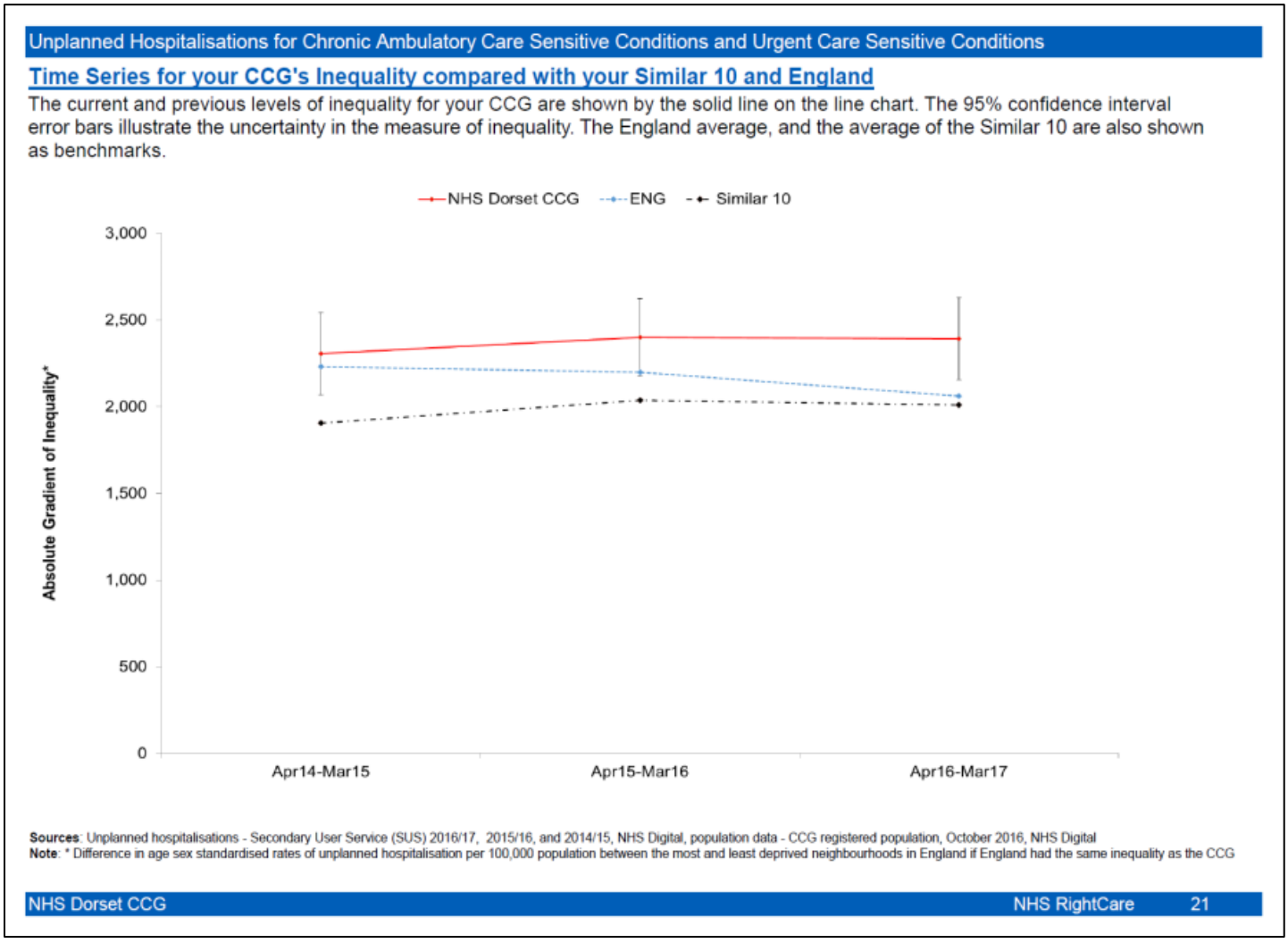


The slide showing IAF inequality indicator time series for the CCG, its Similar 10 and England

This slide shows the trend over the last 3 financial years in ***inequality in unplanned hospitalisation for chronic ambulatory care sensitive and urgent care sensitive conditions as measured using the Absolute Gradient of Inequality (AGI)*** (IAF indicator 106a)[1]. It shows AGI time series for the CCG (red solid line), its population weighted Similar 10 (black dotted and dashed line), and England

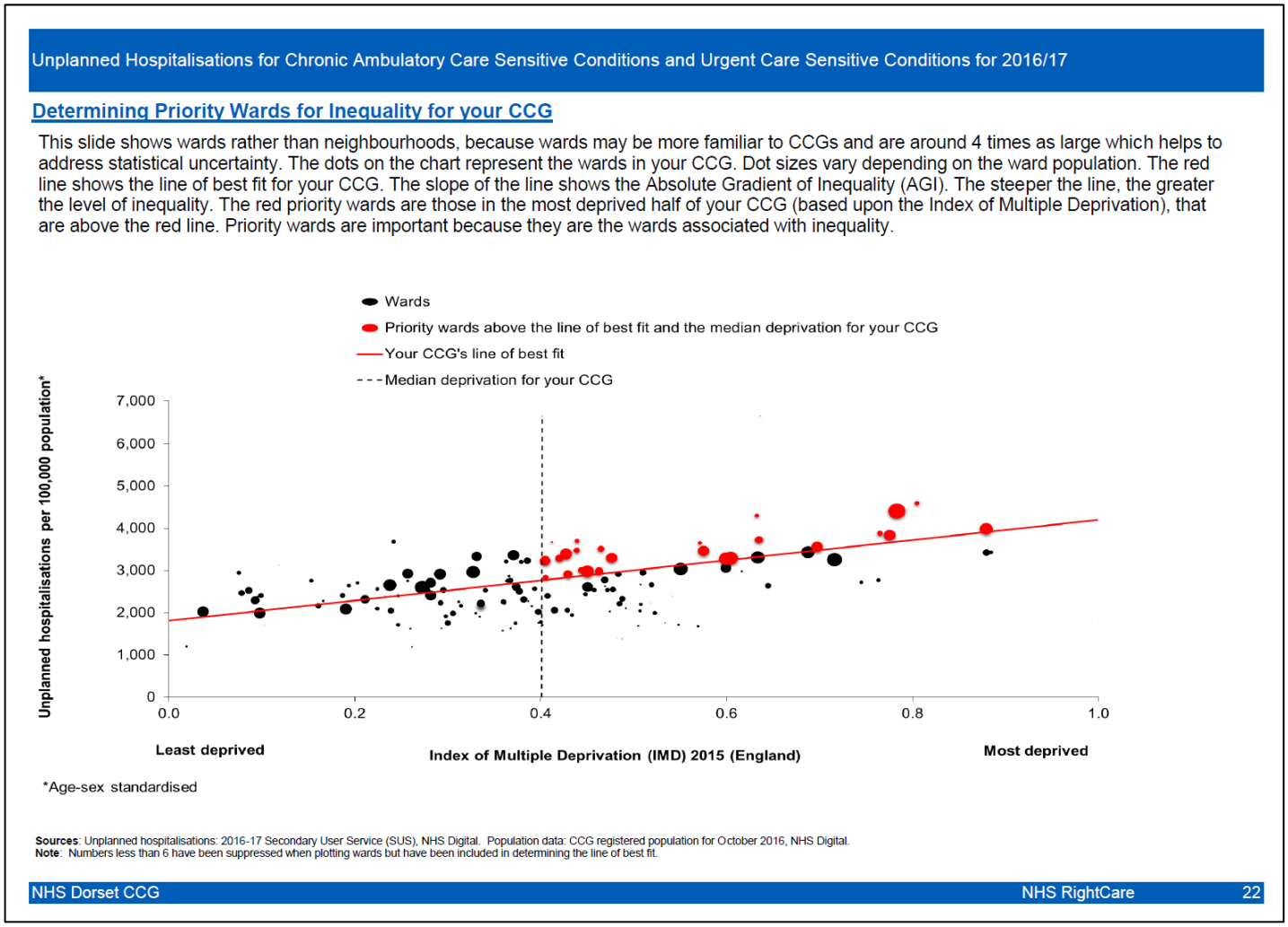
[4] Based upon the standard error for the coefficient on the rank of IMD from the least weighted squares regression for indicator 106a. See https://www.england.nhs.uk/ccg-iaf-indicators/

(blue dashed line). Confidence intervals for the CCG AGIs are based upon published ***standard errors for the coefficient on the rank of IMD in the weighted least squares regression analysis.***



The slide defining priority wards

The red line on this slide shows the published AGI rate and intercept for the CCG (***Dorset in the slide below***)[1]. The bubble chart shows indirectly age sex standardised rates of unplanned hospitalisation per 100,000 population (vertical axis) at neighbourhood (Lower Super Output Area (LSOA)) level, aggregated to ward level using the ONS mapping of 2011 LSOAs to 2015 wards, against the Index of Multiple Deprivation (IMD) 2015[2] on a zero to one scale (horizontal axis). The deprivation score for a ward has been calculated as the population weighted average score of the ward's constituent LSOAs. For rates of unplanned hospitalisation at ward level, the numerator is the sum of the ward's constituent LSOAs indirectly age sex standardised hospitalisations, and the denominator for the ward is the sum of its LSOA's CCG registered population. These data are unpublished at this level and, in line with patient confidentiality protocol, only wards with more than 6 hospitalisations are shown. The size of each bubble reflects the population size of the LSOA it represents. Patients registered in one CCG may come from a ward geographically located in another CCG. Furthermore, a ward's geographic boundaries may overlap boundaries between CCGs. For these reasons some of the bubbles on the chart may represent part wards. The vertical dotted line represents the median IMD score of the neighbourhoods in the CCG. Wards on or above the red AGI "line of best fit" with deprivation scores above the CCG median are labelled priority wards (coloured red).



The slide showing key characteristics of the top 20 priority wards

This slide ranks from highest to lowest the 20 priority wards in the CCG with the highest numbers of unplanned hospitalisations (blue column). A ward must have 50 or more hospitalisations to be listed.

This is to avoid listing part wards outside CCG boundaries as priority wards for the CCG. To the left of these, standardised rates of unplanned hospitalisation and CCG registered population are shown. The rightmost (yellow) column shows for each ward an ***opportunity for saved hospitalisations, if your CCG had no inequality***. For each of the 20 wards, the opportunity is calculated as a ***proportion*** of its unplanned hospitalisations. Any priority wards beyond 20 are listed on the slides as ***other priority wards,*** so that total unplanned hospitalisations and totals of opportunities for saved hospitalisations are consistent between slides***.***

To understand how the ***proportion*** is calculated it is necessary to refer to ***the slide defining priority wards***. For each priority ward the numerator of the ***proportion*** is the difference between the height of the red AGI "line of best fit" at the IMD score of the ward and the height of the same red line at the median deprivation for the CCG (where the vertical black dotted line meets the red AGI line). The denominator of the ***proportion*** is the height of the red AGI "line of best fit" at the IMD score of the ward. In line with patient confidentiality protocol, numbers less than 6 are suppressed. The totals are the sum of the numbers shown (rather than totals of unsuppressed numbers).

Unplanned Hospitalisations for Chronic Ambulatory Care Sensitive Conditions and Urgent Care Sensitive Conditions for 2016/17

Priority Wards for Inequality for your CCG

Up to 20 priority wards, with at least 50 hospitalisations, for your CCG are listed below. The final column shows the opportunity for saved hospitalisations if your CCG had no inequality. This is the number of hospitalisations that would be saved if expected rates for priority wards moved to the expected rate at median deprivation*.

Rank	2015 ward	Population	Unplanned hospitalisations per 100,000 population**	Unplanned hospitalisations	Opportunity for saved hospitalisations, if your CCG had no inequality
1	East Cliff and Springbourne	15,470	4,409	647	161
2	Westbourne and West Cliff	12,205	3,277	564	82
3	Kinson North	10,616	3,559	453	92
4	Boscombe West	11,793	3,986	440	129
5	Newtown	13,441	3,286	439	66
6	Kinson South	10,867	3,836	427	104
7	Ferndown Central	8,052	2,978	413	21
8	Strouden Park	10,340	3,467	404	53
9	Wallisdown and Winton West	10,974	3,392	377	8
10	West Southbourne	10,310	3,299	371	23
11	Creekmoor	9,686	3,230	366	1
12	Dorchester North	6,221	3,514	340	18
13	Hamworthy West	7,445	3,723	267	45
14	Winton East	11,817	2,975	251	10
15	Dorchester West	5,603	3,473	242	8
16	Canford Heath East	7,485	3,286	224	4
17	Branksome West	8,004	2,909	217	5
18	Westham West	3,793	4,305	212	35
19	Grange	5,248	3,879	199	48
20	Cerne Valley	5,043	2,832	197	1
	Other Priority Wards	19,723	3,665	781	71
	Total	**204,136**		**7,831**	**985**

Sources: Unplanned hospitalisations: 2016-17 Secondary User Service (SUS), NHS Digital. Population data: CCG registered population for October 2016, NHS Digital

Notes:
Figures are taken from the Total (where 1 to 5 replaced with 3) column of the Top 10 conditions for priority wards table
Numbers less than 6 have been suppressed
*See Methodology Guide for further details
**Age-sex standardised

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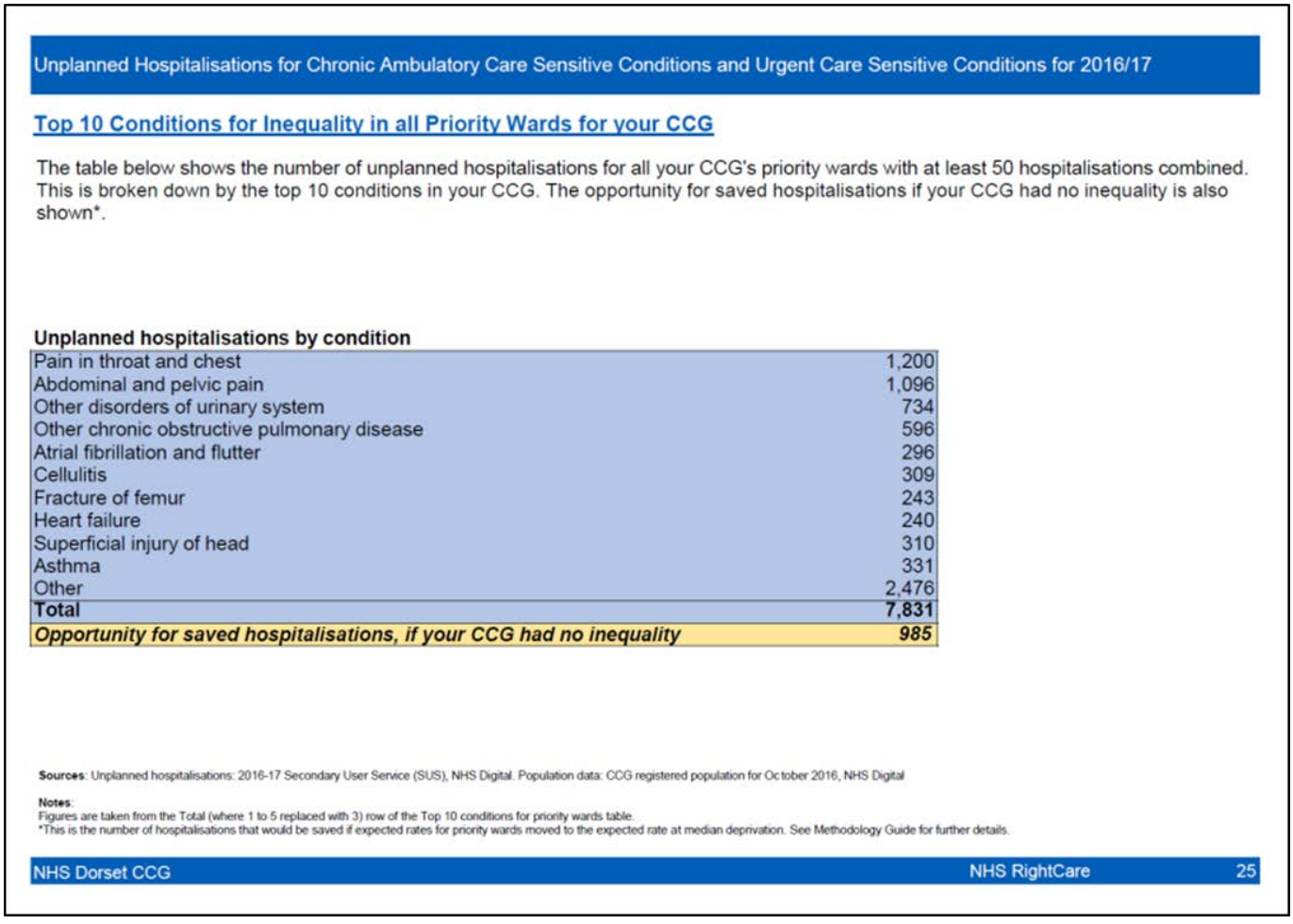
The slide showing the top 10 conditions for all priority wards in aggregate

This slide is based upon analysis of Secondary Uses Service[5] (SUS) data by CCG and three-character, primary diagnosis codes. For each CCG, the diagnoses with the ten highest numbers of unplanned hospitalisations for ambulatory sensitive and urgent care sensitive conditions are determined. If more than one diagnosis has the same number of hospitalisations, conditions are chosen alphabetically from the list of three-character diagnosis codes. Each CCG will typically have different top ten diagnoses. The union of the top 10 diagnoses for all 207 CCGs covers 26 diagnoses. SUS data covering unplanned hospitalisations for CCGs, neighbourhoods (Lower Super Output Areas (LSOAs)) and three-character primary diagnosis codes are then mapped from LSOAs to wards[6]. For the CCG, priority wards are determined as set out in the section ***the slide defining priority wards.*** The top 10 conditions are listed for all priority wards in the CCG in aggregate. The numbers of hospitalisations shown (blue cells) draw upon synthetic data where suppressed numbers (less than 6) have been replaced with 3 on ***the slide showing key characteristics of the top 20 priority wards*** so that total hospitalisations for each condition should be the same on both slides.

For each priority ward the ***opportunity for saved hospitalisations, if your CCG had no inequality*** is calculated as described in the section ***the slide showing key characteristics of the top 20 priority wards.*** The aggregate opportunity summed across all priority wards is shown in the yellow cell on the slide below (so that the totals agree).



Unplanned Hospitalisations for Chronic Ambulatory Care Sensitive Conditions and Urgent Care Sensitive Conditions for 2016/17

Top 10 Conditions for Inequality in all Priority Wards for your CCG

The table below shows the number of unplanned hospitalisations for all your CCG's priority wards with at least 50 hospitalisations combined. This is broken down by the top 10 conditions in your CCG. The opportunity for saved hospitalisations if your CCG had no inequality is also shown*.

Unplanned hospitalisations by condition	
Pain in throat and chest	1,200
Abdominal and pelvic pain	1,096
Other disorders of urinary system	734
Other chronic obstructive pulmonary disease	596
Atrial fibrillation and flutter	296
Cellulitis	309
Fracture of femur	243
Heart failure	240
Superficial injury of head	310
Asthma	331
Other	2,476
Total	**7,831**
Opportunity for saved hospitalisations, if your CCG had no inequality	***985***

Sources: Unplanned hospitalisations: 2016-17 Secondary User Service (SUS), NHS Digital. Population data: CCG registered population for October 2016, NHS Digital

Notes:
Figures are taken from the Total (where 1 to 5 replaced with 3) row of the Top 10 conditions for priority wards table.
*This is the number of hospitalisations that would be saved if expected rates for priority wards moved to the expected rate at median deprivation. See Methodology Guide for further details.

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The slide showing the top 10 conditions and 20 priority wards

[5] https://digital.nhs.uk/services/secondary-uses-service-sus

[6] Using ONS LSOA 2011 to Ward 2015 lookup table. Analysis conducted in MS Access.

This slide draws upon analysis feeding ***the slide showing the top 10 conditions for all priority wards in aggregate*** but for 20 disaggregated priority wards (rather than all)***.*** Numbers less than 6 are suppressed and increased disaggregation means increased suppression. Unplanned hospitalisations are shown in blue. Here the ***Total (where 1 to 5 is replaced with 3)*** row is referenced by slides 25 and 23, so that hospitalisations are consistent between slides 23, 25 and 26.

The rightmost (yellow) column shows the ***opportunity for saved hospitalisations, if your CCG had no inequality.*** The calculation method for this is set out in ***the slide showing key characteristics of the top 20 priority wards.***

The total ***opportunity for saved hospitalisations, if your CCG had no inequality*** is the sum of the numbers shown.

Unplanned Hospitalisations for Chronic Ambulatory Care Sensitive Conditions and Urgent Care Sensitive Conditions for 2016/17

Top 10 Conditions for Inequality for Priority Wards for your CCG

The table below shows up to 20 of your CCG's priority wards, with at least 50 hospitalisations, ranked by the total number of unplanned hospitalisations. This is broken down by the top 10 conditions in your CCG. The opportunity for saved hospitalisations, if your CCG had no inequality is also shown*.

Priority Wards	Unplanned hospitalisations by condition													
	Pain in throat and chest	Abdominal and pelvic pain	Other disorders of urinary system	Other chronic obstructive pulmonary disease	Atrial fibrillation and flutter	Cellulitis	Fracture of femur	Heart failure	Superficial injury of head	Asthma	Other	Total (where 1 to 5 suppressed)	Total (where 1 to 5 replaced with 3)	Opportunity for saved hospitalisations, if your CCG had no inequality
East Cliff and Springbourne	88	102	72	65	14	23	15	28	27	25	188	**647**	**647**	***161***
Westbourne and West Cliff	72	49	45	26	20	12	29	26	29	14	242	**564**	**564**	***82***
Kinson North	64	74	30	40	21	22	10	9	22	24	137	**453**	**453**	***92***
Boscombe West	68	63	24	36	7	11	12	8	24	13	174	**440**	**440**	***129***
Newtown	86	59	37	39	10	21	7	22	18	23	117	**439**	**439**	***66***
Kinson South	72	62	37	38	18	19	7	7	16	20	131	**427**	**427**	***104***
Ferndown Central	66	40	43	19	18	14	25	22	18	10	138	**413**	**413**	***21***
Strouden Park	62	64	26	41	12	20	11	11	22	14	121	**404**	**404**	***53***
Wallisdown and Winton West	57	62	42	35	17	15	14	7	12	12	104	**377**	**377**	***8***
West Southbourne	49	46	31	49	8	13	16	6	17	11	125	**371**	**371**	***23***
Creekmoor	67	43	32	31	21	19	17	10	8	15	103	**366**	**366**	***1***
Dorchester North	53	42	40	7	13	21	17	13	.	15	116	**337**	**340**	**18**
Hamworthy West	29	42	26	13	10	11	11	6	10	18	91	**267**	**267**	**45**
Winton East	38	47	28	8	8	7	.	.	12	17	80	**245**	**251**	**10**
Dorchester West	37	26	30	9	18	7	6	8	8	10	83	**242**	**242**	**8**
Canford Heath East	45	32	15	19	19	7	.	.	7	16	58	**218**	**224**	**4**
Branksome West	30	46	16	15	7	12	.	.	8	12	65	**211**	**217**	**5**
Westham West	31	22	28	14	6	9	6	8	8	6	74	**212**	**212**	**35**
Grange	27	26	15	19	10	18	.	7	9	8	57	**196**	**199**	**48**
Cerne Valley	23	33	19	8	.	11	11	6	8	11	64	**194**	**197**	**1**
Other Priority Wards	136	116	98	65	36	17	17	27	24	37	208	**781**	**781**	**71**
Total (where 1 to 5 suppressed)	**1,200**	**1,096**	**734**	**596**	**293**	**309**	**231**	**231**	**307**	**331**	**2,476**	**7,804**		**985**
Total (where 1 to 5 replaced with 3)	**1,200**	**1,096**	**734**	**596**	**296**	**309**	**243**	**240**	**310**	**331**	**2,476**		**7,831**	

Sources: Unplanned hospitalisations: 2016-17 Secondary User Service (SUS), NHS Digital. Population data: CCG registered population for October 2016, NHS Digital.

Notes:
Numbers between 1 and 5 have been suppressed or replaced with 3.
*This is the number of hospitalisations that would have been saved if expected rates for the priority wards moved to the expected rate at median deprivation. See Methodology Guide for further details.

Standardising rates of unplanned hospitalisations for ambulatory and urgent care sensitive conditions by sex, age and ethnicity

CCG rates by sex are indirectly standardised for deprivation and age. CCG rates by age are indirectly standardised for deprivation and sex. CCG rates by ethnicity are indirectly standardised for sex, age and deprivation. To construct these standardisations, data intersectionality across sex, age and ethnicity are needed, as well as a way of linking to the Index of Multiple Deprivation (IMD) 2015 for deprivation[2]. The most granular level of data at within-CCG level with full intersectionality for both unplanned hospitalisations and estimates of CCG registered population is Middle Super Output Area (MSOA) level.

To standardise for deprivation, IMD data at LSOA level are converted to MSOA level, using an ONS lookup table[7]. IMD rank scores for MSOAs are calculated as population weighted averages of their constituent LSOA scores. Ventiles (or twentiles) of deprivation are calculated for each MSOA. Each MSOA is given a score between 1 and 20 according to its IMD ranking.

CCG registered population data are split by age and sex, but not by ethnicity. MSOA level data from the 2011 Census has been used to link this data to ethnic group and IMD 2015 at within-CCG level. CCG registered population data at MSOA level by sex, age, and deprivation are split by ethnic group using 2011 Census MSOA sex age level data ethnic group splits. These splits are then recombined to CCG level and used as denominators for rates by ethnic group.

For unplanned hospitalisations (UHs) for ambulatory and urgent care sensitive conditions, Secondary Uses Service (SUS) data are split by sex, age, and ethnicity at MSOA level and linked to IMD ventiles of deprivation.

These data are used to construct indirectly standardised rates of unplanned hospitalisations (UHs) for:

- Sex groups, by dividing expected UHs (allowing for the deprivation and age split of each CCG) for each sex group by the corresponding population.
- Age groups, by dividing expected UHs (allowing for the deprivation and sex split of each CCG) for each age group by the corresponding population.
- Sex-age groups, by dividing expected UHs (allowing for the deprivation of each CCG) for each sex-age group by the corresponding population.
- Ethnic groups, by dividing expected UHs (allowing for the deprivation, age and sex split of each CCG) for each ethnic group by the corresponding population.

For ethnicity there is an additional complication. The ethnic group classification for SUS data is based upon the 2001 Census, whereas the ethnic group classification for the population split is based upon the 2011 Census. Consideration of alignment questions in the censuses[8], and the likely impact of population migration on some of the smaller groups, led to rates being constructed for the following groups: White, BME, Asian, (split into Indian, Pakistani and Bangladeshi), Black (split into African and Caribbean) and Other.

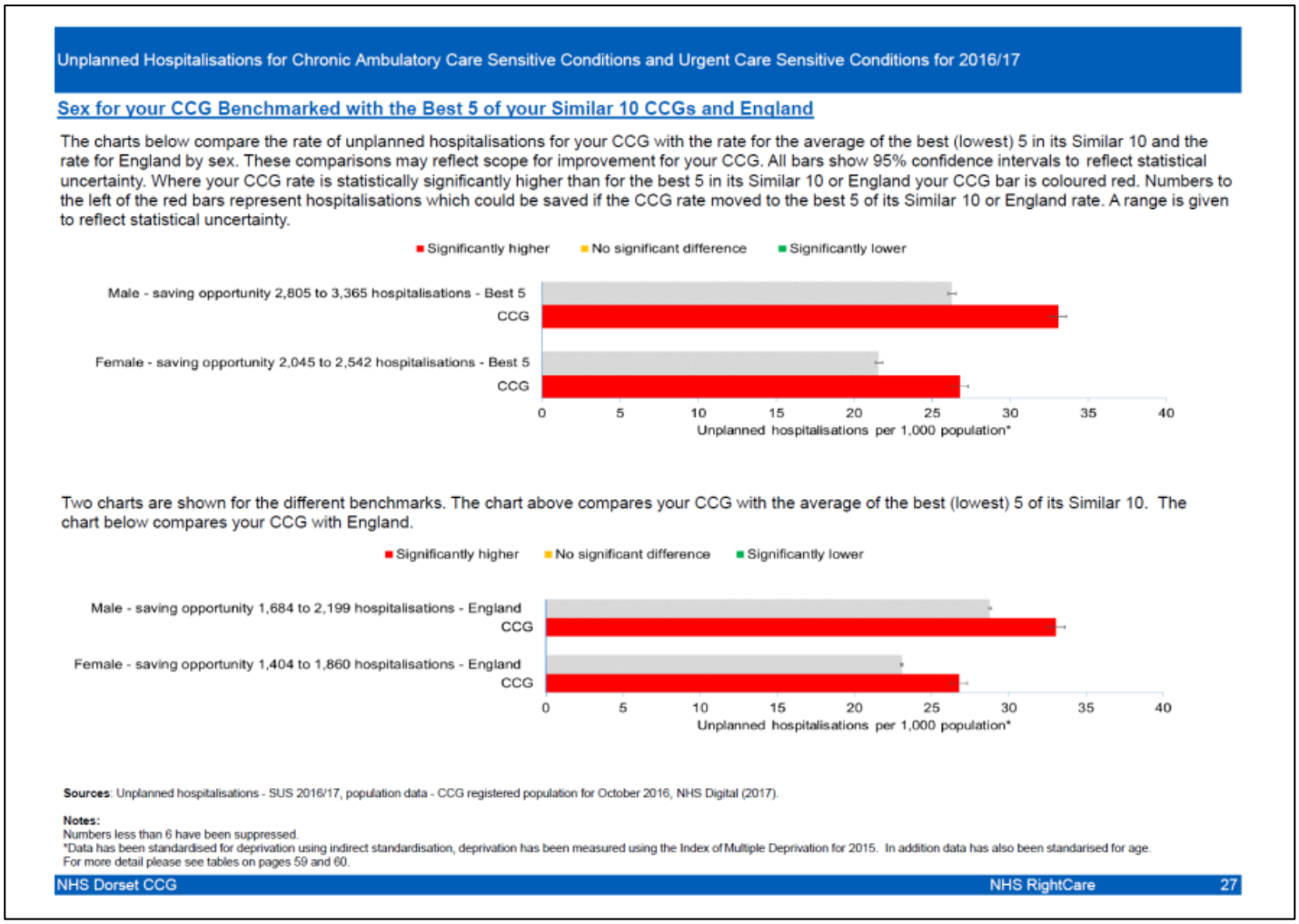
[7] Link to lookup table https://data.gov.uk/harvest/gemini-object/7742857e-26d4-4ca0-933d-b6eafa012ac8
[8] Census Comparability 2001 and 2011

The slides benchmarking the CCG rate of unplanned hospitalisations for chronic ambulatory care sensitive conditions and urgent care conditions for sex, age and ethnic groups

These slides show standardised rates of unplanned hospitalisations for ambulatory care sensitive conditions and urgent care conditions for the CCG for sex, age and ethnic groups together with benchmarks. Confidence intervals (95%) for both the CCG and its benchmarks are constructed using Byar's[9] method.

From the Similar 10 CCGs, the five with the lowest overall indirectly sex, age and deprivation standardised rates of unplanned hospitalisations are selected as the best five for a benchmark. Aggregate standardised rates (sum of numerators divided by sum of denominators) for these five CCGs are constructed by sex, age and ethnicity as benchmarks. England rates by sex, age and ethnicity are constructed as further benchmarks.

For each protected characteristic group, bar charts compare the CCG with each of its benchmarks. CCG bars are placed next to benchmark bars which are shaded grey. For example, charts comparing the CCG to both the best five of Similar 10 and to England for sex group are shown below.



[9] See page 7 of The Association of Public Health Observatory Technical Briefing 3 Common PH Stats and Confidence Intervals https://fingertips.phe.org.uk/documents/APHO%20Tech%20Briefing%203%20Common%20PH%20Stats%20and%20CIs.pdf

CCG bars are RAG-rated according to whether they are statistically significantly different from benchmarks. Where the CCG bar shows a higher rate than the benchmark and the confidence intervals of the CCG bar do not overlap with the confidence intervals of the benchmark, the CCG bar is coloured red. Where the CCG bar shows a lower rate than the benchmark bar and the confidence intervals of the CCG bar do not overlap with the confidence intervals of the benchmark bar, the CCG bar is coloured green. Where confidence intervals of the CCG bar and the benchmark bar overlap, the CCG bar is coloured amber.

Opportunities for savings are calculated where a red bar is shown. The difference between the CCG and the benchmark indirectly standardised rates is calculated and 95% confidence intervals on this difference are constructed by modelling the uncertainty involved as that associated with the difference between two Poisson distributions:

95% Confidence Intervals =($hospitalisations_{CCG}/pop_{CCG} - hospitalisations_{benchmark}/pop_{benchmark}$)

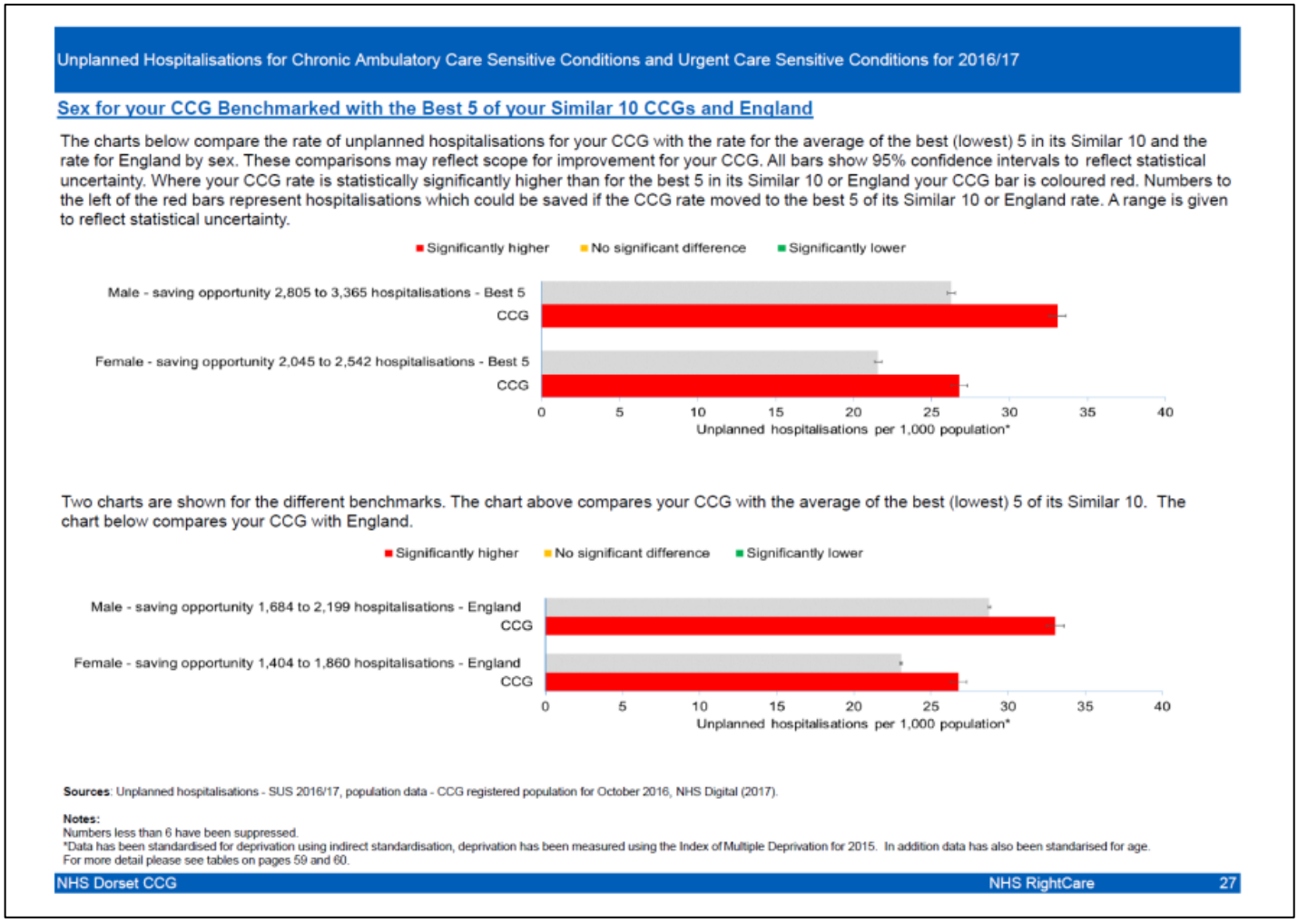
+/- 1.96 * Square Root ($hospitalisations_{CCG}/(pop_{CCG})^2 + hospitalisations_{benchmark}/(pop_{benchmark})^2$)

(1.96 being the z value for 95% confidence intervals assuming a Normal Distribution)

To derive upper and lower savings opportunities for a particular group for a protected characteristic, the upper and lower confidence interval values for the difference in indirectly standardised rates between the CCG and its benchmark are divided by the CCG's indirectly standardised rate and multiplied by the CCG's unplanned hospitalisations. For each protected characteristic group and benchmark where the CCG bar is shaded red, these figures are used to give a proportionate range for a saving opportunity which is shown on the chart (for example for the chart above for females in comparison with England there is a savings opportunity between 1,404 and 1,860 hospitalisations). Given the uncertainties involved, it is possible for such ranges to include negative numbers, but in the packs, these are shown as zeros, which are more understandable to CCGs from a service improvement perspective.

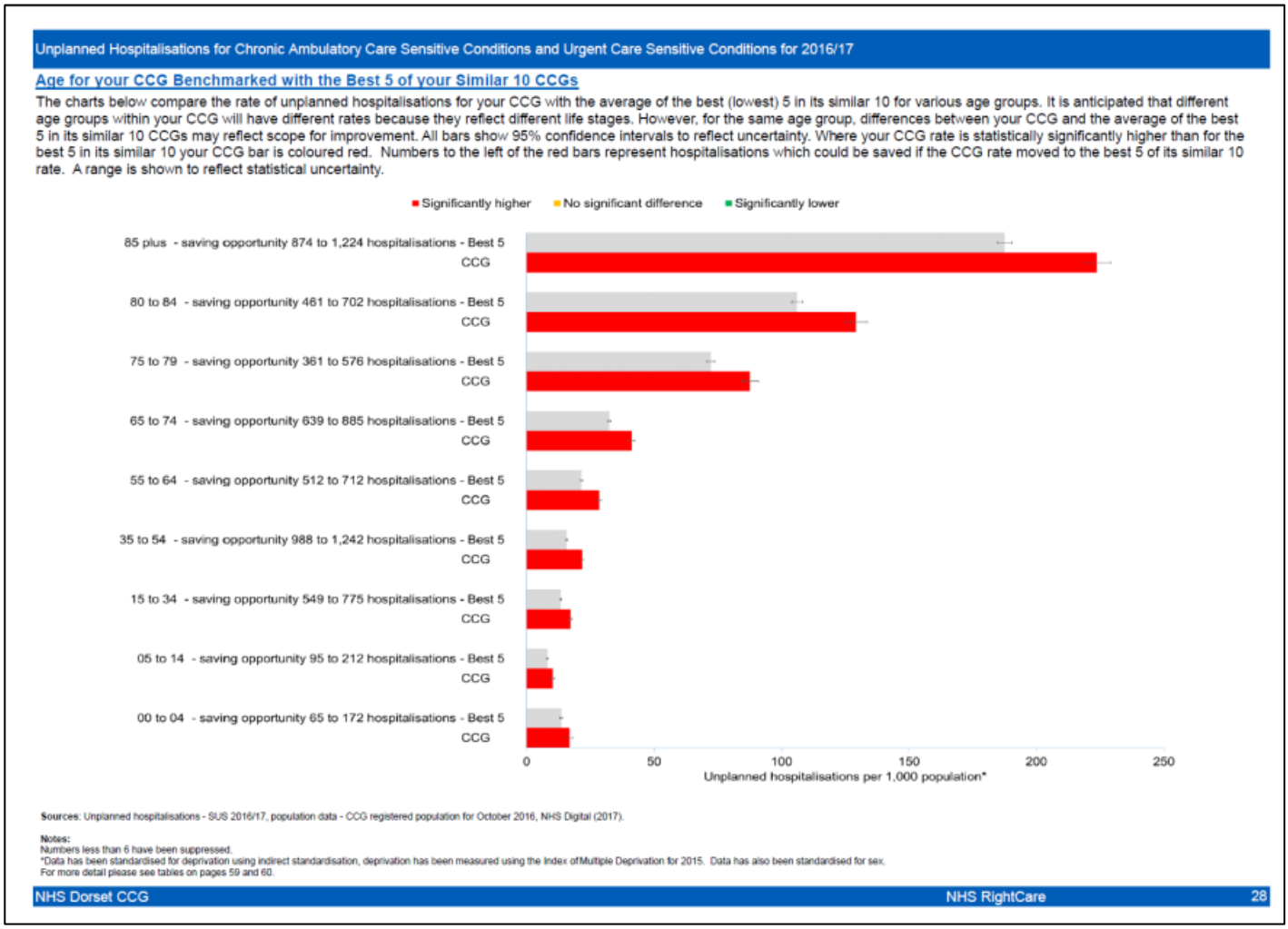
The slide benchmarking the CCG rate of unplanned hospitalisations for chronic ambulatory care sensitive conditions and urgent care conditions by sex

This slide compares the CCG rate by sex with its best 5 of Similar 10 and with England. Rates are standardised by deprivation and age. Byar[9] confidence intervals are calculated for the CCG and benchmarks. A CCG bar is RAG-rated on how it compares to the benchmark and whether or not it has overlapping confidence intervals with the benchmark. For example, the CCG bar is coloured red where it has a high rate relative to the benchmark and confidence intervals show no overlap. For red bars a range of potential savings opportunities is given. For more detail see the section ***the slide benchmarking the CCG rate of unplanned hospitalisations for chronic ambulatory care sensitive conditions and urgent care conditions for sex, age and ethnic groups.***



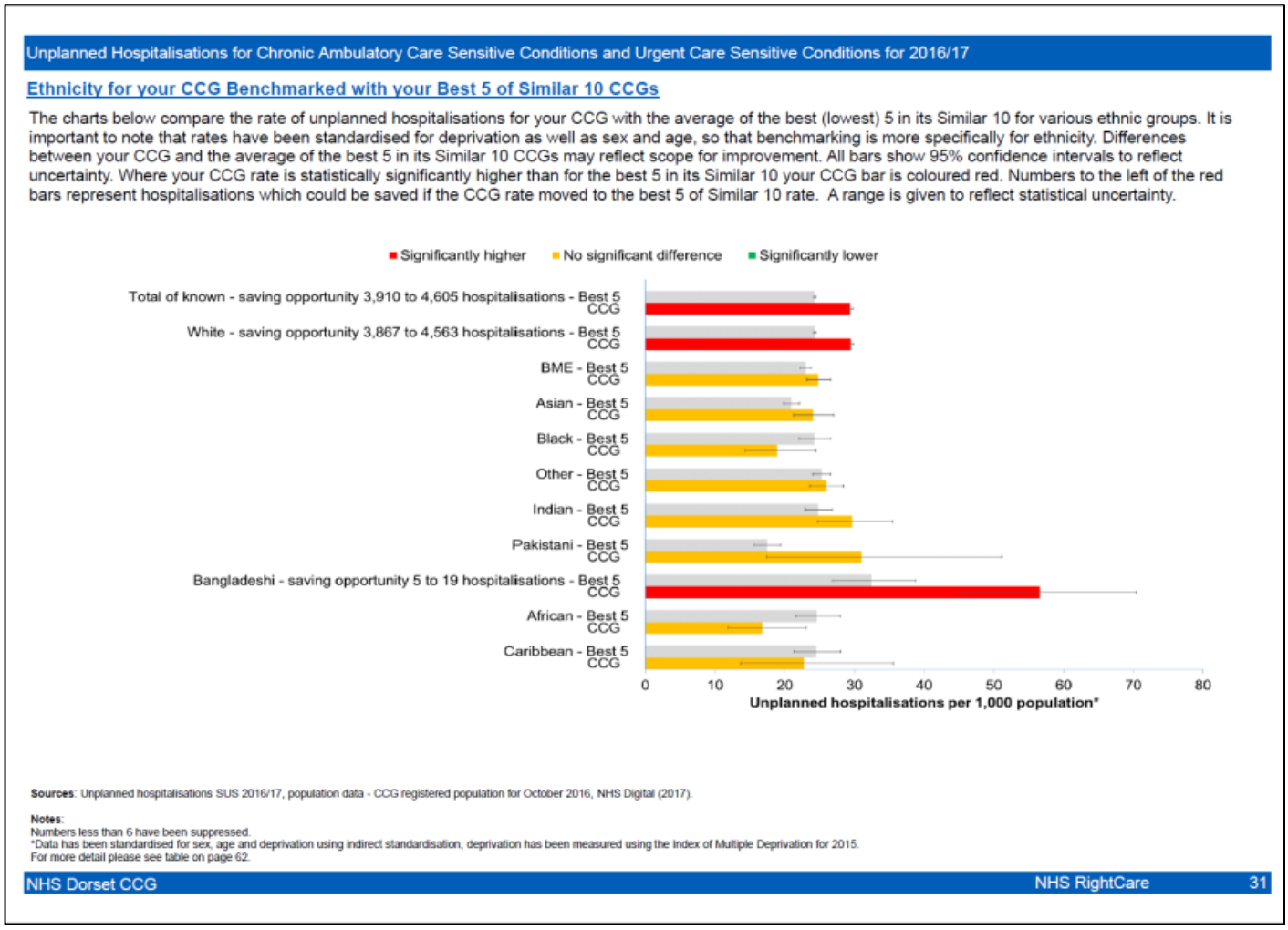
The slides benchmarking the CCG rate of unplanned hospitalisations for chronic ambulatory care sensitive conditions and urgent care conditions for age groups

There are two slides benchmarking CCG rates for age groups with the best 5 of Similar 10 CCGs (example below) and England respectively. Rates are indirectly standardised for deprivation and sex. Byar[9] confidence intervals are calculated for the CCG and benchmarks. CCG bars are RAG-rated on how they compare to the benchmark and whether or not they have overlapping confidence intervals with benchmarks. For example, the CCG bar is coloured red where it has a high rate relative to the benchmark and confidence intervals show no overlap. For red bars a range of potential savings opportunities is given. For more detail see the section ***the slide benchmarking the CCG rate of unplanned hospitalisations for chronic ambulatory care sensitive conditions and urgent care conditions for sex, age and ethnic groups.***



The slides benchmarking the CCG rate of unplanned hospitalisations for chronic ambulatory care sensitive conditions and urgent care conditions for ethnic groups

There are two slides benchmarking CCG rates for ethnic groups with the best 5 of Similar 10 CCGs (example below) and England respectively. Rates are indirectly standardised for deprivation, age and sex. Byar[9] confidence intervals are calculated for the CCG and benchmarks. The CCG's bars are RAG-rated on how it compares to the benchmark and whether or not it has overlapping confidence intervals with the benchmark. For example, the CCG bar is coloured red where it has a high rate relative to the benchmark and confidence intervals show no overlap. For red bars a range of potential savings opportunities is given. For more detail see the section ***the slide benchmarking the CCG rate of unplanned hospitalisations for chronic ambulatory care sensitive conditions and urgent care conditions for sex, age and ethnic groups.***

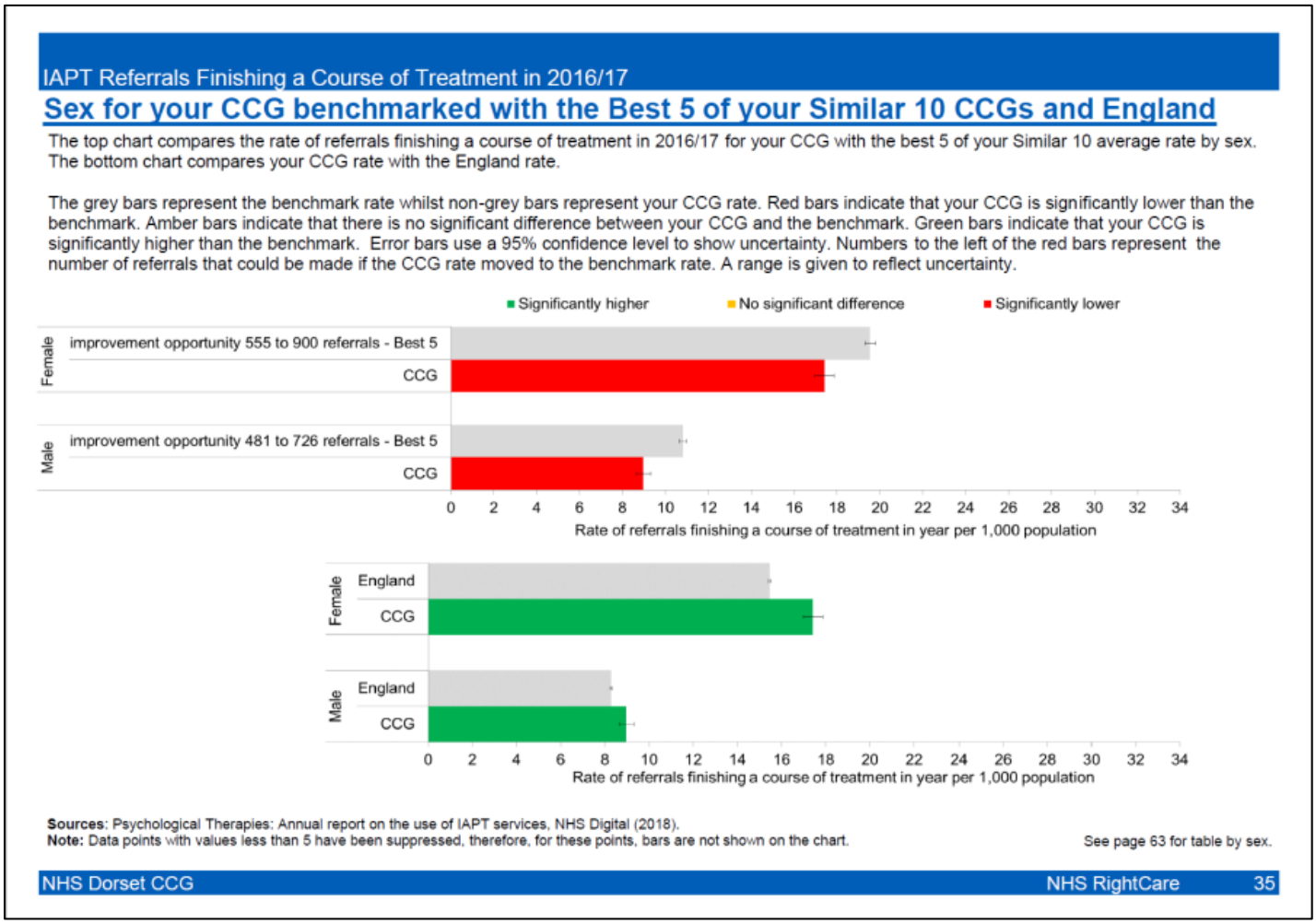


EHI in Psychological Therapy Referral Rates and Recovery Rates through the Improving Access to Psychological Therapies (IAPT) Programme

The section is about EHI in relation to the IAPT Programme[10]. The EHI RightCare pack compares unstandardized referral and moving to recovery rates for the CCG with the population weighted average rate of the best 5 of its RightCare Similar 10 CCGs[3] and the England rate. It does this for the following groups: sex group, age group, ethnic group and deprivation quintile (IAPT deciles of are paired and combined into quintiles). There is a separate slide for referral and recovery rates for each group. For each slide the CCG is benchmarked against the best 5 of its RightCare Similar 10 and England. For referral rates by ethnic group, population denominators used are as described in standardising rates of unplanned hospitalisations for ambulatory and urgent care sensitive conditions by sex, age and ethnicity.

The slides benchmarking CCG referral rates against the best 5 CCGs of its RightCare Similar 10 and England for the various groups

The slide below provides an example. It benchmarks the CCG's referral rates (rate of referrals finishing a course of treatment per 100,000 population) by sex group against the best 5 of its Similar 10 and England.



[10] https://digital.nhs.uk/data-and-information/publications/statistical/psychological-therapies-annual-reports-on-the-use-of-iapt-services/annual-report-2016-17

From the Similar 10 CCGs, the five with the highest overall referral rates are selected as the best five for a benchmark. Aggregate rates (sums of referral numerators divided by sums of population denominators) for these five CCGs are constructed for sex, age and ethnicity groups as benchmarks. England rates by sex, age and ethnicity groups are constructed as further benchmarks. Byar[9] confidence intervals are calculated for the CCG and benchmarks. CCG bars are RAG-rated according to whether they are statistically significantly different from benchmarks. Where the CCG bar shows a lower rate than the benchmark and the confidence intervals of the CCG bar do not overlap with the confidence intervals of the benchmark, the CCG bar is coloured red. Where the CCG bar shows a higher rate than the benchmark bar and the confidence intervals of the CCG bar do not overlap with the confidence intervals of the benchmark bar, the CCG bar is coloured green. Where confidence intervals of the CCG bar and the benchmark bar overlap, the CCG bar is coloured amber. Where a red bar is shown an improvement, opportunity is calculated.

The difference between the benchmark and CCG referral rates is calculated and 95% confidence intervals on this difference constructed by modelling the uncertainty involved as that associated with the difference between two Poisson distributions:

95% Confidence Intervals =($referrals_{benchmark}$ /$pop_{benchmark}$ – $referrals_{CCG}$/pop_{CCG})

+/- 1.96 * Square Root ($referrals_{CCG}$/(pop_{CCG})^2 + $referrals_{benchmark}$ /($pop_{benchmark}$) ^{2})

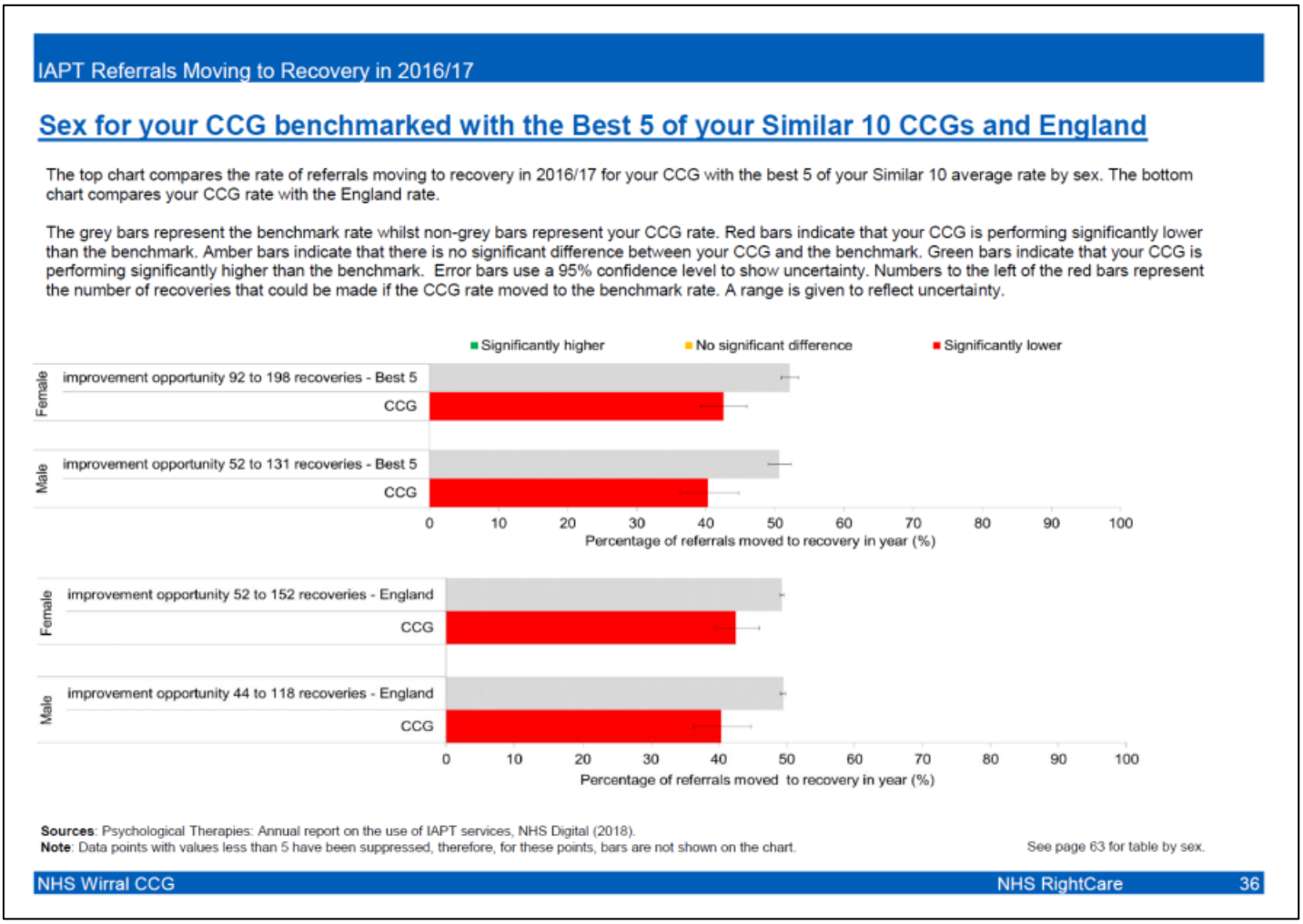
(1.96 being the z value for 95% confidence intervals assuming a Normal Distribution)

To derive upper and lower improvement opportunities for a particular group for a protected characteristic, the upper and lower confidence interval values for the difference in rates between the benchmark and its CCG are divided by the CCG's rate and multiplied by the number of referrals for the CCG.

For each protected characteristic group where the CCG bar is shaded red in comparison to a benchmark, these figures are used to give a proportionate range for an improvement opportunity which is shown on the chart (for example for Dorset CCG in the chart above, in comparison with the best five of the CCG's Similar 10, there is an improvement opportunity for the CCG to refer 556 to 900 more female patients). Given the uncertainties involved, it is possible for such ranges to include negative numbers, but in the packs, these are shown as zeros, which are more understandable to CCGs from a service improvement perspective.

The slides benchmarking CCG movement to recovery rates against the best 5 CCGs of its RightCare Similar 10 and England for the various groups

The slide below provides an example. It benchmarks the Wirral CCG's moving to recovery rates (percentage of referrals moving to recovery in year) by sex group against the best 5 of its Similar 10 and England.



From the Similar 10 CCGs, the five with the highest overall moving to recovery rates are selected as the best five for a benchmark. Aggregate rates (sums of movement to recovery numerators divided by sums of referral denominators) for these five CCGs are constructed for sex, age and ethnicity groups as benchmarks. England rates by sex, age and ethnicity groups are constructed as further benchmarks. Byar[9] confidence intervals are calculated for the CCG and benchmarks. CCG bars are RAG-rated according to whether they are statistically significantly different from benchmarks. Where the CCG bar shows a lower rate than the benchmark and the confidence intervals of the CCG bar do not overlap with the confidence intervals of the benchmark, the CCG bar is coloured red. Where the CCG bar shows a higher rate than the benchmark bar and the confidence intervals of the CCG bar do not overlap with the confidence intervals of the benchmark bar, the CCG bar is coloured green. Where confidence intervals of the CCG bar and the benchmark bar overlap, the CCG bar is coloured amber. Where a red bar is shown an improvement, opportunity is calculated.

The difference between the benchmark and CCG moving to recovery rates is calculated, and 95% confidence intervals on this difference are constructed by modelling the uncertainty involved as that associated with the difference between two Poisson distributions:

95% Confidence Intervals =($recoveries_{benchmark}$ /$referrals_{benchmark}$ – $recoveries_{CCG}$/$referrals_{CCG}$)

+/- 1.96 * Square Root ($recoveries_{CCG}$/($referrals_{CCG}$)^2 + $recoveries_{benchmark}$ /($referrals_{benchmark}$) ^{2})

(1.96 being the z value for 95% confidence intervals assuming a Normal Distribution)

To derive upper and lower improvement opportunities for a particular group for a protected characteristic, the upper and lower confidence interval values for the difference in rates between the benchmark and its CCG are divided by the CCG's rate and multiplied by the number moving to recovery for the CCG.

For each protected characteristic group where the CCG bar is shaded red in comparison to a benchmark, these figures are used to give a proportionate range for an improvement opportunity which is shown on the chart (for example for the sex group chart above for Wirral CCG, in comparison with the best five of the CCGs Similar 10, there is an improvement opportunity for the CCG to enable 92 to 189 more female referrals to move to recovery). Given the uncertainties involved, it is possible for such ranges to include negative numbers, but in the packs, these are shown as zeros, which are more understandable to CCGs from a service improvement perspective.

Annex Slides

The slides in the Annex tabulating benchmarking of the CCG rate of unplanned hospitalisations for chronic ambulatory care sensitive conditions and urgent care conditions for sex and age groups

These slides' tables compare the CCG's rates for sex and age groups with its best 5 of Similar 10 and with England, and provide more detail for bar chart slides earlier in the pack.

Unplanned Hospitalisations for Chronic Ambulatory Care Sensitive Conditions and Urgent Care Sensitive Conditions for 2016/17

Sex and Age for your CCG Benchmarked with your Best 5 of Similar 10 CCGs and England

The table below compares rates of unplanned hospitalisations for your CCG with the average of the best (lowest) 5 of its Similar 10 and the rate for England for various sex-age groups. It is anticipated that different sex-age groups within your CCG will have different rates because they reflect different life stages. However, for the same age sex group, variation by geography may reflect scope for improvement. A red traffic light indicates your CCG has a statistically significantly higher rate than its geographic comparator. For red traffic lights, the number of hospitalisations which could be saved if your CCG moved to the same rate as its geographic comparator are shown. A range is given to reflect statistical uncertainty.

Sex or Age	CCG		Rate per 1,000 population*			Rate comparisons				Opportunity for saved hospitalisations	
	Population	Hospitalisations	CCG	Best 5 of Similar 10	England	CCG & Similar 10	% Difference	CCG & England	% Difference	Best 5 of Similar 10	England
Male	390,597	11,813	27	22	23	R	+19%	R	+14%	2,045 to 2,542	1,404 to 1,860
Female	402,026	15,047	33	26	29	R	+21%	R	+13%	2,805 to 3,365	1,684 to 2,199
00 to 04	37,697	627	17	14	13	R	+19%	R	+24%	65 to 172	104 to 202
05 to 14	79,613	784	10	8	8	R	+20%	R	+23%	95 to 212	123 to 231
15 to 34	181,414	2,949	17	13	12	R	+22%	R	+29%	549 to 775	744 to 951
35 to 54	204,201	3,974	22	16	16	R	+28%	R	+28%	988 to 1,242	987 to 1,221
55 to 64	100,422	2,511	28	22	24	R	+24%	R	+17%	512 to 712	335 to 521
65 to 74	99,389	3,634	41	33	37	R	+21%	R	+10%	639 to 885	256 to 481
75 to 79	33,228	2,671	88	72	82	R	+18%	R	+6%	361 to 576	59 to 255
80 to 84	26,746	3,242	129	106	125	R	+18%	A	+3%	461 to 702	.
85 plus	29,913	6,468	224	187	215	R	+16%	R	+4%	874 to 1,224	83 to 396

R CCG is significantly higher
A CCG is not significantly different
G CCG is significantly lower

Sources: Unplanned hospitalisations - SUS 2016/17, population data - CCG registered population for October 2016, NHS Digital (2017).

Notes:
Numbers less than 6 have been suppressed.
*Data has been standardised for deprivation using indirect standardisation. Deprivation has been measured using the Index of Multiple Deprivation for 2015. In addition age is standarised for sex and sex for age.

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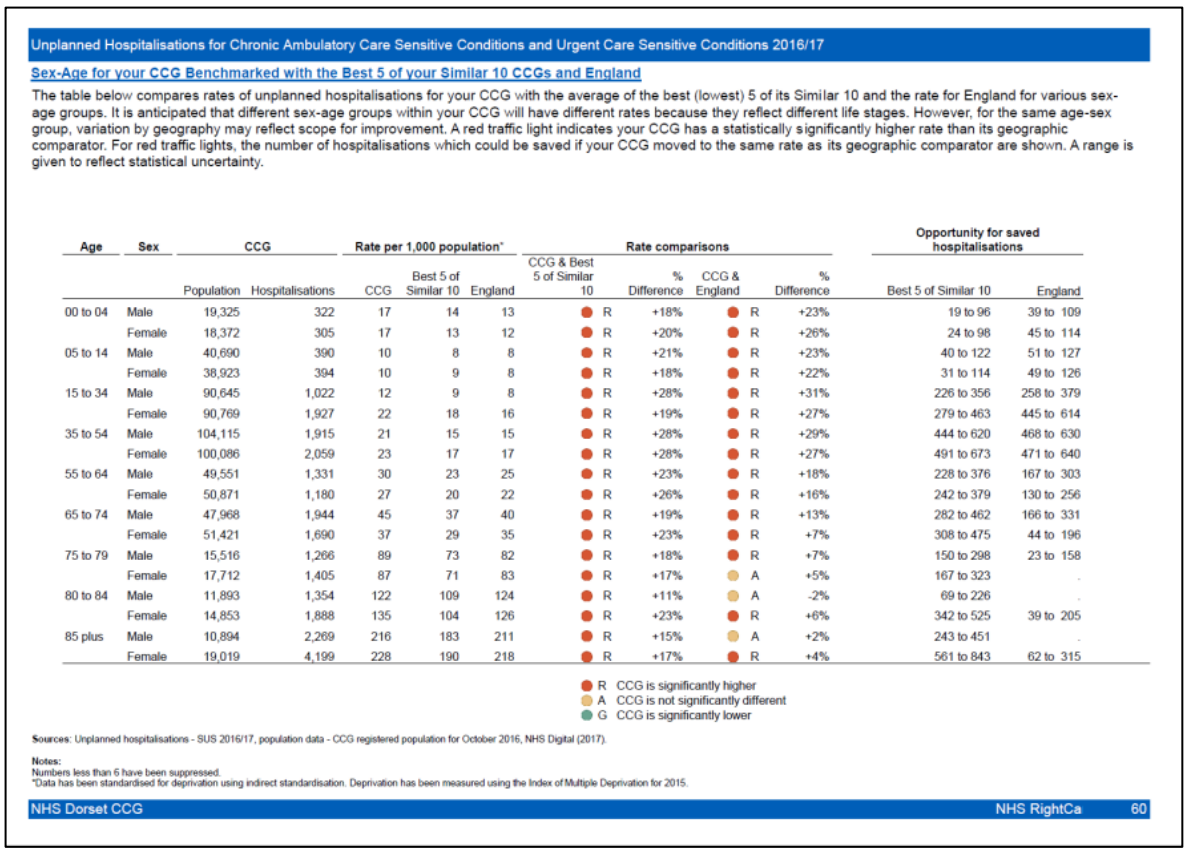

Unplanned Hospitalisations for Chronic Ambulatory Care Sensitive Conditions and Urgent Care Sensitive Conditions 2016/17

Sex-Age for your CCG Benchmarked with the Best 5 of your Similar 10 CCGs and England

The table below compares rates of unplanned hospitalisations for your CCG with the average of the best (lowest) 5 of its Similar 10 and the rate for England for various sex-age groups. It is anticipated that different sex-age groups within your CCG will have different rates because they reflect different life stages. However, for the same age-sex group, variation by geography may reflect scope for improvement. A red traffic light indicates your CCG has a statistically significantly higher rate than its geographic comparator. For red traffic lights, the number of hospitalisations which could be saved if your CCG moved to the same rate as its geographic comparator are shown. A range is given to reflect statistical uncertainty.

Age	Sex	CCG		Rate per 1,000 population*			Rate comparisons				Opportunity for saved hospitalisations	
		Population	Hospitalisations	CCG	Best 5 of Similar 10	England	CCG & Best 5 of Similar 10	% Difference	CCG & England	% Difference	Best 5 of Similar 10	England
00 to 04	Male	19,325	322	17	14	13	R	+18%	R	+23%	19 to 96	39 to 109
	Female	18,372	305	17	13	12	R	+20%	R	+26%	24 to 98	45 to 114
05 to 14	Male	40,690	390	10	8	8	R	+21%	R	+23%	40 to 122	51 to 127
	Female	38,923	394	10	9	8	R	+18%	R	+22%	31 to 114	49 to 126
15 to 34	Male	90,645	1,022	12	9	8	R	+28%	R	+31%	226 to 356	258 to 379
	Female	90,769	1,927	22	18	16	R	+19%	R	+27%	279 to 463	445 to 614
35 to 54	Male	104,115	1,915	21	15	15	R	+28%	R	+29%	444 to 620	468 to 630
	Female	100,086	2,059	23	17	17	R	+28%	R	+27%	491 to 673	471 to 640
55 to 64	Male	49,551	1,331	30	23	25	R	+23%	R	+18%	228 to 376	167 to 303
	Female	50,871	1,180	27	20	22	R	+26%	R	+16%	242 to 379	130 to 256
65 to 74	Male	47,968	1,944	45	37	40	R	+19%	R	+13%	282 to 462	166 to 331
	Female	51,421	1,690	37	29	35	R	+23%	R	+7%	308 to 475	44 to 196
75 to 79	Male	15,516	1,266	89	73	82	R	+18%	R	+7%	150 to 298	23 to 158
	Female	17,712	1,405	87	71	83	R	+17%	A	+5%	167 to 323	.
80 to 84	Male	11,893	1,354	122	109	124	R	+11%	A	-2%	69 to 226	.
	Female	14,853	1,888	135	104	126	R	+23%	R	+6%	342 to 525	39 to 205
85 plus	Male	10,894	2,269	216	183	211	R	+15%	A	+2%	243 to 451	.
	Female	19,019	4,199	228	190	218	R	+17%	R	+4%	561 to 843	62 to 315

R CCG is significantly higher
A CCG is not significantly different
G CCG is significantly lower

Sources: Unplanned hospitalisations - SUS 2016/17, population data - CCG registered population for October 2016, NHS Digital (2017).

Notes:
Numbers less than 6 have been suppressed.
*Data has been standardised for deprivation using indirect standardisation. Deprivation has been measured using the Index of Multiple Deprivation for 2015.

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The first table shows sex and age separately, and the second considers the intersectionality of age and sex together. Rates are indirectly standardised for deprivation. Age groups are also indirectly standardised for sex and sex groups for age. Percentage difference columns show the percentage reductions that would need to be made to the CCG's groups' rates for them to reach the benchmark.

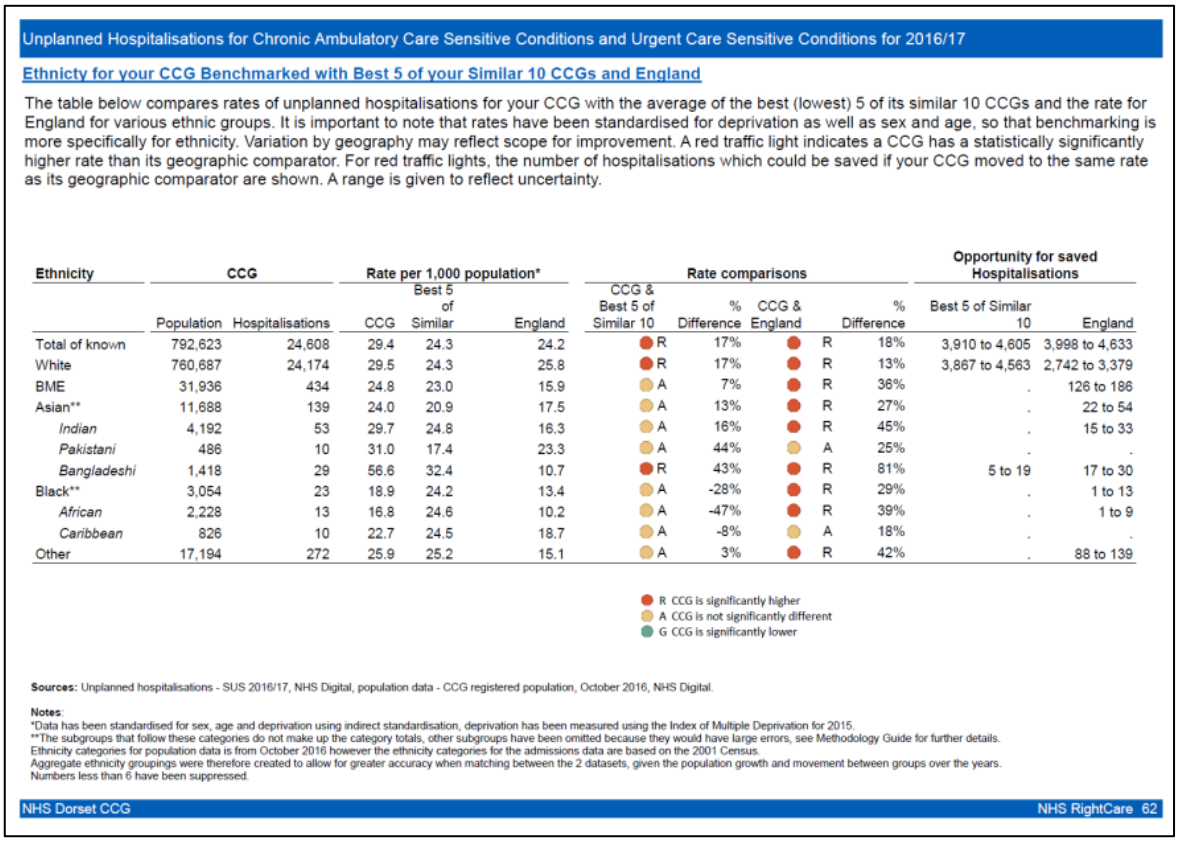
Byar[9] confidence intervals are calculated for the CCG and benchmarks. CCG groups are RAG-rated on how they compare with benchmarks and whether or not they have overlapping confidence intervals with benchmarks. For example, a CCG group is rated red where it has a high rate relative to the benchmark and confidence intervals show no overlap. For red ratings a range of potential savings opportunities is given. For more detail on how savings opportunities are calculated see the section ***the slide benchmarking the CCG rate of unplanned hospitalisations for chronic ambulatory care sensitive conditions and urgent care conditions for sex, age and ethnic groups.***

The slide in the Annex tabulating benchmarking of the CCG rate of unplanned hospitalisations for chronic ambulatory care sensitive conditions and urgent care conditions for ethnic groups

This slide's table compares the CCG's rates for ethnic groups with its best 5 of Similar 10 and England, and provides more detail for bar chart slides earlier in the pack. Rates are indirectly standardised for sex, age, and deprivation. Percentage difference columns show the percentage reductions that would need to be made to the CCG's groups' rates for them to reach the benchmark.

Byar[9] confidence intervals are calculated for the CCG and benchmarks. CCG groups are RAG-rated on how they compare with benchmarks and whether or not they have overlapping confidence intervals with benchmarks. For example, a CCG group is rated red where it has a high rate relative to the benchmark and confidence intervals show no overlap. For red ratings a range of potential savings opportunities is given. For more detail on how savings opportunities are calculated see the section ***the slide benchmarking the CCG rate of unplanned hospitalisations for chronic ambulatory care sensitive conditions and urgent care conditions for sex, age and ethnic groups.***

For England, 6.6% of hospitalisation and 0.44% of the population are of unknown ethnicity and the extent to which the data are unknown will vary by CCG. For each CCG, a data quality table immediately below the ethnicity table shows numbers and percentage rates of unknowns for unplanned hospitalisations and CCG registered population for the CCG, the best 5 of Similar 10 and England. For percentage rates, CCGs are RAG-rated on how they compare with benchmarks and whether or not they have overlapping confidence intervals with benchmarks. For example, a CCG group is rated red where it has a high rate relative to the benchmark and confidence intervals show no overlap.



Unplanned Hospitalisations for Chronic Ambulatory Care Sensitive Conditions and Urgent Care Sensitive Conditions for 2016/17

Ethnicty for your CCG Benchmarked with Best 5 of your Similar 10 CCGs and England

The table below compares rates of unplanned hospitalisations for your CCG with the average of the best (lowest) 5 of its similar 10 CCGs and the rate for England for various ethnic groups. It is important to note that rates have been standardised for deprivation as well as sex and age, so that benchmarking is more specifically for ethnicity. Variation by geography may reflect scope for improvement. A red traffic light indicates a CCG has a statistically significantly higher rate than its geographic comparator. For red traffic lights, the number of hospitalisations which could be saved if your CCG moved to the same rate as its geographic comparator are shown. A range is given to reflect uncertainty.

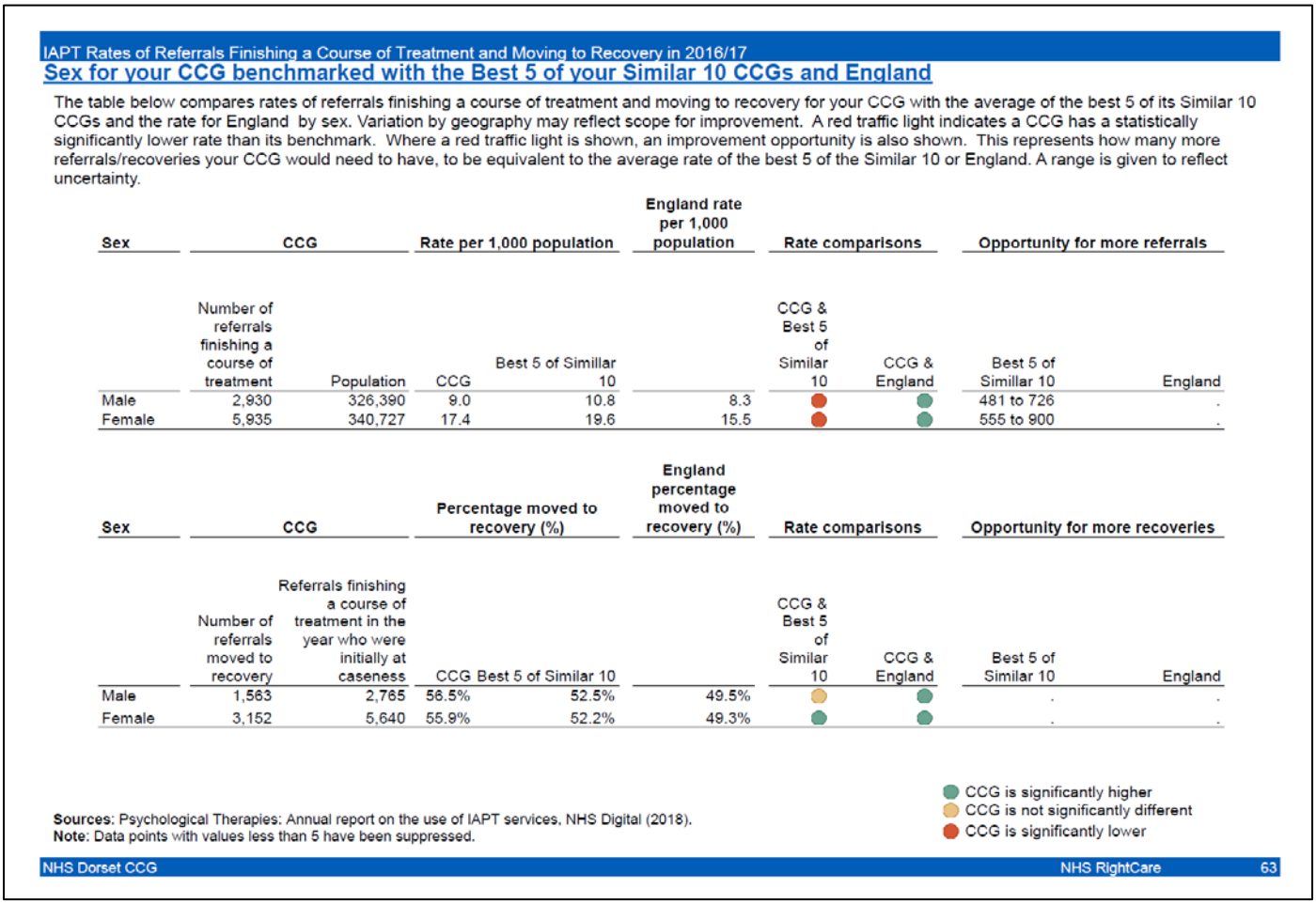
Ethnicity	CCG		Rate per 1,000 population*			Rate comparisons				Opportunity for saved Hospitalisations	
	Population	Hospitalisations	CCG	Best 5 of Similar	England	CCG & Best 5 of Similar 10	% Difference	CCG & England	% Difference	Best 5 of Similar 10	England
Total of known	792,623	24,608	29.4	24.3	24.2	R	17%	R	18%	3,910 to 4,605	3,998 to 4,633
White	760,687	24,174	29.5	24.3	25.8	R	17%	R	13%	3,867 to 4,563	2,742 to 3,379
BME	31,936	434	24.8	23.0	15.9	A	7%	R	36%	.	126 to 186
Asian**	11,688	139	24.0	20.9	17.5	A	13%	R	27%	.	22 to 54
Indian	4,192	53	29.7	24.8	16.3	A	16%	R	45%	.	15 to 33
Pakistani	486	10	31.0	17.4	23.3	A	44%	A	25%	.	.
Bangladeshi	1,418	29	56.6	32.4	10.7	R	43%	R	81%	5 to 19	17 to 30
Black**	3,054	23	18.9	24.2	13.4	A	-28%	R	29%	.	1 to 13
African	2,228	13	16.8	24.6	10.2	A	-47%	R	39%	.	1 to 9
Caribbean	826	10	22.7	24.5	18.7	A	-8%	A	18%	.	.
Other	17,194	272	25.9	25.2	15.1	A	3%	R	42%	.	88 to 139

R CCG is significantly higher
A CCG is not significantly different
G CCG is significantly lower

Sources: Unplanned hospitalisations - SUS 2016/17, NHS Digital, population data - CCG registered population, October 2016, NHS Digital.

Notes:
*Data has been standardised for sex, age and deprivation using indirect standardisation, deprivation has been measured using the Index of Multiple Deprivation for 2015.
**The subgroups that follow these categories do not make up the category totals, other subgroups have been omitted because they would have large errors, see Methodology Guide for further details.
Ethnicity categories for population data is from October 2016 however the ethnicity categories for the admissions data are based on the 2001 Census.
Aggregate ethnicity groupings were therefore created to allow for greater accuracy when matching between the 2 datasets, given the population growth and movement between groups over the years.
Numbers less than 6 have been suppressed.

NHS Dorset CCG NHS RightCare 62



IAPT Rates of Referrals Finishing a Course of Treatment and Moving to Recovery in 2016/17

Sex for your CCG benchmarked with the Best 5 of your Similar 10 CCGs and England

The table below compares rates of referrals finishing a course of treatment and moving to recovery for your CCG with the average of the best 5 of its Similar 10 CCGs and the rate for England by sex. Variation by geography may reflect scope for improvement. A red traffic light indicates a CCG has a statistically significantly lower rate than its benchmark. Where a red traffic light is shown, an improvement opportunity is also shown. This represents how many more referrals/recoveries your CCG would need to have, to be equivalent to the average rate of the best 5 of the Similar 10 or England. A range is given to reflect uncertainty.

Sex	CCG		Rate per 1,000 population		England rate per 1,000 population	Rate comparisons		Opportunity for more referrals	
	Number of referrals finishing a course of treatment	Population	CCG	Best 5 of Similar 10		CCG & Best 5 of Similar 10	CCG & England	Best 5 of Similar 10	England
Male	2,930	326,390	9.0	10.8	8.3			481 to 726	.
Female	5,935	340,727	17.4	19.6	15.5			555 to 900	.

Sex	CCG		Percentage moved to recovery (%)		England percentage moved to recovery (%)	Rate comparisons		Opportunity for more recoveries	
	Number of referrals moved to recovery	Referrals finishing a course of treatment in the year who were initially at caseness	CCG	Best 5 of Similar 10		CCG & Best 5 of Similar 10	CCG & England	Best 5 of Similar 10	England
Male	1,563	2,765	56.5%	52.5%	49.5%			.	.
Female	3,152	5,640	55.9%	52.2%	49.3%			.	.

CCG is significantly higher
CCG is not significantly different
CCG is significantly lower

Sources: Psychological Therapies: Annual report on the use of IAPT services, NHS Digital (2018).
Note: Data points with values less than 5 have been suppressed.

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The slides in the Annex tabulating benchmarking of the CCG IAPT rates of referral and movement to recovery for sex, age, sex-age, ethnicity and deprivation groups

These slides' tables compare the CCG's referral and moving to recovery rates for sex, age, sex-age, ethnicity and deprivation groups with corresponding values for its best 5 of Similar 10 CCG and England, and provide more detail for bar chart slides earlier in the pack. An example slide for sex groups is shown below.

Byar[9] confidence intervals are calculated for the CCG and benchmarks. CCG groups are RAG-rated on how they compare with benchmarks and whether or not they have overlapping confidence intervals with benchmarks. For example, a CCG group is rated red where it has a low rate relative to the benchmark and confidence intervals show no overlap. For red ratings a range of potential improvement opportunities is given. For more detail on how improvement opportunities are calculated see sections:

- ***The slides benchmarking CCG referral rates against the best 5 CCGs of its RightCare Similar 10 and England for the various groups***
- ***The slides benchmarking CCG movement to recovery rates against the best 5 CCGs of its RightCare Similar 10 and England for the various groups***

Annex A

Indirect standardisation

The indirectly standardised ratio (ISR) for a local or subject population is defined as follows

$$ISR = \frac{O}{E} \times 100 = \frac{\sum_i O_i}{\sum_i E_i} \times 100 = \frac{\sum_i O_i}{\sum_i n_i \lambda i} \times 100$$

Where:

O is the total observed number of events in the local or subject population

E is the total number of expected events in the local or subject population, given the standard rates λi in the reference or standard population;

Oi is the observed numbers of events in the local or subject population in (age, sex, …) group i;

Ei is the expected number of events in the local or subject population in (age, sex, …) group i, given the standard rate λi in the reference or standard population;

ni is the number of individuals in the local or subject population in (age, sex, …) group i;

λi is the crude specific rate in the reference or standard population in (age, sex, …) group i;

The indirect standardised rate is given by the rate for England * indirectly standardised ratio/100.

Confidence intervals

Given that both measures are rates, it was appropriate to use the Byar[9] method for calculating confidence intervals. Other than rates, one could argue that the recovery rate is a proportion. However, given that there is a time dimension (looking at recovery rates over a year, not a singular point in time) a rate is most appropriate.

Below are the steps taken to calculate the upper and lower rates:

Lower limit for observed number of events **(lower numerator)**:

$$O \times \left(1 - \frac{1}{9O} - \frac{Z}{3\sqrt{O}}\right)^3$$

Upper limit for observed number of events **(upper numerator)**:

$$(O+1) \times \left(1 - \frac{1}{9(O+1)} + \frac{Z}{3\sqrt{(O+1)}}\right)^3$$

Lower Rate:

$$\left(\frac{lower\ numerator}{n}\right) \times scale\ rate$$

Upper Rate:

$$\left(\frac{upper\ numerator}{n}\right) \times scale\ rate$$

For rates of unplanned hospitalisations for ambulatory care sensitive conditions and urgent care sensitive conditions:

$o\ =\ Number\ of\ indireclty\ standardised\ unplanned\ hospitalisations\ in\ the\ year$

$z\ =\ z\ score\ for\ 0.05\ significance\ level$

$n\ =\ Population$

For IAPT referral rates:

$o\ =\ Number\ of\ referrals\ finishing\ a\ course\ of\ treatment\ in\ the\ year$

$z\ =\ z\ score\ for\ 0.05\ significance\ level$

$n\ =\ Population$

For IAPT moving to recovery rates:

$o\ =\ Number\ of\ referrals\ moving\ to\ recovery\ in\ the\ year$

$z\ =\ z\ score\ for\ 0.05\ significance\ level$

n

$= Number\ of\ referrals\ finishing\ a\ course\ of\ treatment\ in\ the\ year\ who\ were\ initially\ at\ caseness.$

Here the scale rate is 1,000 (per 1000 population) for rates of unplanned hospitalisations and IAPT referral rates, but 100 for the IAPT % moving to recovery rate.

Statistical significance

Part of the analysis is determining whether the difference between the CCG rate and benchmark rate is statistically significant. The method the analysis uses was influenced by the public health observatory guide, which follows the view that non-overlapping confidence intervals are significant.

If the difference is significant, and the point estimate for the CCG is greater than the point estimate for the benchmark, then the CCG's rate is said to be significantly higher. This determines the RAG rating for the indicator, for example CCG bars are coloured red for rates of unplanned hospitalisations but green for IAPT referral rates.

$$IF\ LCI_{CCG}\ >\ UCI_{Benchmark}\ Then\ CCG\ Rate\ is\ signifcantly\ higher$$

If there is no significant difference, then the CCG bars are coloured amber.

If the difference is significant, and the point estimate for the CCG is smaller than the point estimate for the benchmark, then the CCG rate is said to be significantly lower. Once again this determines the RAG rating for the indicator, for example CCG bars are coloured green for rates of unplanned hospitalisations but red for IAPT referral rates.

$$IF\ UCI_{CCG}\ <\ LCI_{Benchmark}\ Then\ CCG\ Rate\ is\ signifcantly\ lower$$

Savings opportunity and improvement opportunity calculations

The analysis also calculates how many more referrals need to finish a course of treatment, or move to recovery, to have the same rate as the best 5 for England.

Saving/improvement opportunities are only shown for CCGs with red RAG ratings relative to benchmarks. Rather than just calculating the central estimate that would align the CCG rate with the benchmark rate, a range is calculated to highlight the uncertainty in both rates.

The following calculations are used to calculate the range:

$r_1 = CCG\ Rate$
$r_2 = Benchmark\ Rate$
$x_1 = CCG\ Numerator$
$x_2 = Benchmark\ Numerator$
$y_1 = CCG\ Denominator$
$y_2 = Benchmark\ Denominator$

1) Difference between the benchmark rate and CCG rate:

$$For\ saving\ opportunities \quad r_1 - r_2$$
$$For\ improvement\ opportunities \quad r_2 - r_1$$

2) The uncertainty in the difference between the rates **(Uncertainty in difference)**:

$$\sqrt{\left(\frac{x_1}{{y_1}^2}\right) + \left(\frac{x_2}{{y_2}^2}\right)} \times scale\ rate \times 1.96$$

Here the scale rate is 1,000 (per 1000 population) for rates of unplanned hospitalisations and IAPT referral rates, but 100 for the IAPT % moving to recovery rate. (1.96 being the z value for 95% confidence intervals assuming a Normal Distribution)

3) The upper confidence interval for the difference between the CCG and benchmark rate **(UCI)**:

$$Difference\ between\ benchmark\ rate\ and\ CCG\ rate + Uncertainty\ in\ difference$$

4) The lower confidence interval for the difference between the CCG and benchmark rate **(LCI)**:

$$Difference\ between\ benchmark\ rate\ and\ CCG\ rate - Uncertainty\ in\ difference$$

5) The upper confidence interval for how many more referrals/recoveries are needed to align the CCG rate with the benchmark rate:

$$\left(\frac{UCI}{r_1}\right) \times x_1$$

6) The lower confidence interval for how many more referrals/recoveries are needed to align the CCG rate with the benchmark rate:

$$\left(\frac{LCI}{r_1}\right) \times x_1$$

Consequently, the numbers produced in calculations 5 and 6 represent the range of either:

1. Fewer unplanned hospitalisations or
2. Extra IAPT referrals/recoveries

The CCG should aim to have similar rates to the benchmark, assuming a fixed denominator.

Further detail on IAPT calculations

Point estimates for indicators

The IAPT analysis focuses on two indicators:

1) **Access**: Rate of referrals finishing a course of treatment in the year per 1000 population.
2) **Outcome**: Rate of referrals moving to recovery in the year.

The rates for the indicators are calculated in the following way:

Rate of referrals finishing a course of treatment in the year per 1000 population:

$$\left(\frac{Number\ of\ referrals\ finishing\ a\ course\ of\ treatment\ in\ the\ year}{Total\ population}\right) \times\ 1000$$

Rate of referrals moving to recovery in the year (%):

$$\left(\frac{Number\ of\ referrals\ moved\ to\ recovery}{Number\ of\ referrals\ finishing\ a\ course\ of\ treatment\ in\ the\ year\ who\ were\ initially\ at\ caseness}\right) \times\ 100$$

There is one slight difference to the NHS Digital published data, and the data presented in this analysis. The percentage of referrals moved to recovery reported by NHS Digital is not equal to the calculation above due to issues of rounding and data confidentiality. Consequently, the Right Care analysis does not use the same figures for the subject 'Number of referrals moved to recovery' as NHS Digital, and instead calculates it as the following:

$$\left(\frac{Percentage\ of\ referrals\ moved\ to\ recovery \times Number\ of\ referrals\ finishing\ a\ course\ of\ treatment\ who\ were\ initially\ at\ caseness}{100}\right)$$

This method was chosen so that the 'percentage of referrals moved to recovery' is an exact match to the numerator and denominator within the analysis. However, within the annexes, only the numerators published by NHS Digital are displayed.

Weightings

The analysis compares CCG access and outcome rates to the national rate, and the best 5 of the similar 10 CCGs rate.

To calculate the best 5 of the similar 10, one could have taken an arithmetic mean of each CCGs access and outcome rate across all of the protected characteristic breakdowns. However, given the varying population sizes in each breakdown, such a measure gives equal weighting to each breakdown. Consequently, weighting by population produces a more accurate mean as breakdowns with larger populations have a greater effect on the mean.

An important decision made in relation to the numerator used for the calculation of the best 5 of similar 10 confidence intervals was to add each individual CCG's numerator together, as opposed to taking an average of the 5. This was justified by the fact that the best 5 represents approximately 5 times the amount of data then just one CCG, so this reduction in uncertainty should be represented in the width of the intervals.

To determine the best 5 of the similar 10 CCGs, a population weighted average is taken for each of the 10 CCGs referral/recovery rate. Below is an example of a population weighted average referral rate for a CCG by Ethnicity.

Firstly, a weight is calculated for each of the ethnicity breakdowns:

$$\frac{CCG\ Population_{Asian}}{CCG\ Population_{Total}} = Weight_{Asian}$$

$$\frac{CCG\ Population_{Black}}{CCG\ Population_{Total}} = Weight_{Black}$$

$$\frac{CCG\ Population_{Mixed}}{CCG\ Population_{Total}} = Weight_{Mixed}$$

$$\frac{CCG\ Population_{Other}}{CCG\ Population_{Total}} = Weight_{Other}$$

$$\frac{CCG\ Population_{White}}{CCG\ Population_{Total}} = Weight_{White}$$

The sum of the product is then calculated for each weight and its respective rate:

$$\big((Weight_{Asian} \times CCG\ Rate_{Asian}) + (Weight_{Black} \times CCG\ Rate_{Black}) + (Weight_{Mixed} \times CCG\ Rate_{Mixed}) + (Weight_{Other} \times CCG\ Rate_{Other}) + (Weight_{White} \times CCG\ Rate_{White})\big) = CCG\ Population\ Weighted\ Average$$

The CCGs are then ranked from the highest population weighted referral rate to lowest, with the top 5 selected to represent the best 5 of the similar 10. The same approach is taken for recovery rates; however, the weight is 'the number of referrals finishing a course of treatment in the year who were initially at caseness', not population. The next step is to calculate the average referral rate for the best 5 of the similar 10 for each breakdown of the associated protected characteristic. Below is an example of how the best 5 of the similar 10 weighted average referral rate for Asians is calculated.

Firstly, a weight is calculated for each of the CCGs within the best 5:

$$\frac{Asian\ Population_{\ CCG1}}{Asian\ Population_{Best\ 5}} = Weight_{CCG1}$$

$$\frac{Asian\ Population_{\ CCG2}}{Asian\ Population_{Best\ 5}} = Weight_{CCG2}$$

$$\frac{Asian\ Population_{\ CCG3}}{Asian\ Population_{Best\ 5}} = Weight_{CCG3}$$

$$\frac{Asian\ Population_{\ CCG4}}{Asian\ Population_{Best\ 5}} = Weight_{CCG4}$$

$$\frac{Asian\ Population_{\ CCG5}}{Asian\ Population_{Best\ 5}} = Weight_{CCG5}$$

The sum of the product is then calculated for each weight and its respective rate:

$$\begin{aligned}&\big((Weight_{CCG1} \times Asian\ Rate_{CCG1}) + (Weight_{CCG2} \times Asian\ Rate_{CCG2}) + (Weight_{CCG3} \times Asian\ Rate_{CCG3})\\&\quad + (Weight_{CCG4} \times Asian\ Rate_{CCG4}) + (Weight_{CCG5} \times Asian\ Rate_{CCG5})\big)\\&\quad = Best\ 5\ of\ simillar\ 10\ Population\ Weighted\ Average\ Asian\ Referral\ Rate\end{aligned}$$

Following the calculation of the best 5 of the similar 10 weighted average referral rate, it is important to calculate the number of referrals that would be observed given this rate and the sum of the best 5 CCG's populations. This is in order to generate a numerator for calculating the confidence intervals for the best 5 of the similar 10 referral rate.
Below is an example of the calculation for calculating the overall number of Asian referrals for the best 5 of the similar 10:

$$\left(\frac{Asian\ Population_{Best\ 5}}{1000}\right) \times Best\ 5\ Asian\ Referral\ Rate$$

Suppression of small numbers to protect patient confidentiality

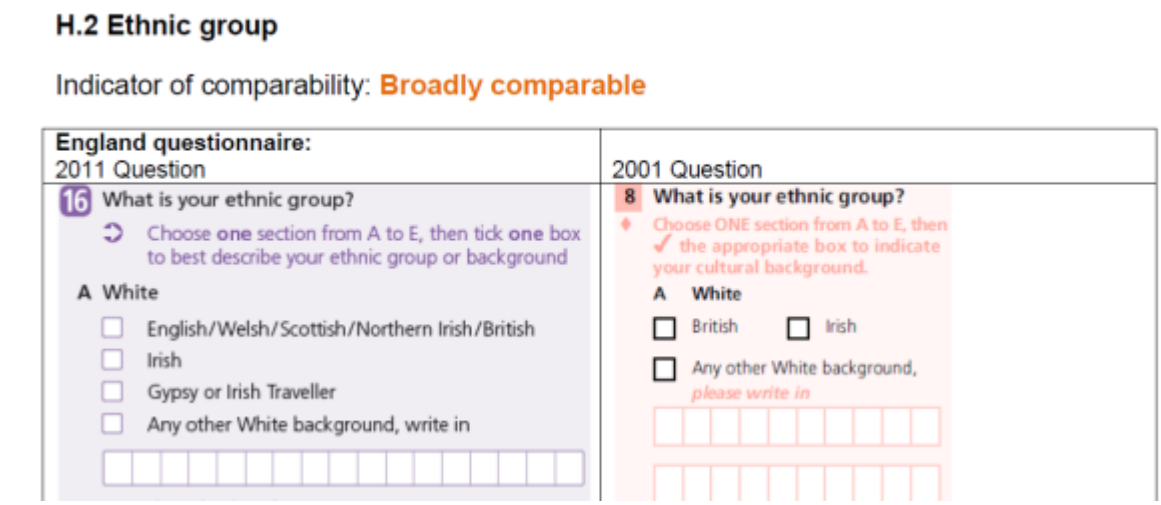
Unplanned hospitalisations are shown by:

- Priority wards (slide 23)
- By aggregate priority wards split across the top 10 conditions and "other" (slide 25)
- By both priority wards and the top 10 conditions and "other" (slide 26)

For these slides, in line with NHS Digital protocol to protect patient confidentiality, non-zero numbers less than 6 have been suppressed[11].

To get a sense of what the full unsuppressed data might look like, synthetic data replacing all suppressed numbers with 3 have been created. These synthetic data have been used to produce slide 26, which is split by both the CCG's priority wards and the CCG's top 10 conditions. These data have then been summed across priority wards to get a total for each top 10 conditions (slide 25) and conditions to get a total for each priority ward (slide 23). This means numbers of unplanned hospitalisations will be consistent across 23, 25 and 26.

Ethnic groups



Ethnicity categorisations for both:

- The numerator for CCG IAF indicator 106a on unplanned hospitalisations (based upon SUS data)
- Referrals and recoveries for Improving Access to Psychological Therapies

are based upon the NHS Data Dictionary which in turn is based upon the 2001 Census definitions.

October 2016 CCG Registered population data at MSOA level, have been split using the 2011 Census aligned to 2001 Census ethnicity splits to match numerator ethnicity splits.

White for the 2011 Census has been based upon combining all 4 boxes in Q16. BME is the remaining non-White ethnicities combined.

[11] See http://docs.adrn.ac.uk/888040/mrdoc/pdf/888040_hes-analy-guide-apr13.pdf (sections 5.2 and 5.4)

To construct rates for White, we are, in effect, aligning all 3 boxes from Q8 in the 2001 Census for numerators (unplanned hospitalisations / IAPT referrals or recoveries), with all 4 boxes from Q16 in the 2011 Census for population denominators

At CCG level for unplanned hospitalisations, BME rates are then constructed using non-White for numerators divided by non-White denominators, so that for BME the numerator is defined as every ethnicity except white.

For IAPT analyses in the EHI Rightcare packs, at CCG level a compromise has been made between observations/power in the data and disaggregation, such that White, Asian, Black, Mixed, Other and unknown have been used (based upon the first part of each row in the right-hand column in the table below).

Data dictionary	**ONS aggregated category**
White British	White
White Irish	White
Any other white background	White
Mixed – White and Black Caribbean	Mixed/ Multiple ethnic groups
Mixed – White and Black African	Mixed/ Multiple ethnic groups
Mixed – White and Asian	Mixed/ Multiple ethnic groups
Mixed – Any other mixed background	Mixed/ Multiple ethnic groups
Asian or Asian British – Indian	Asian/ Asian British
Asian or Asian British – Pakistani	Asian/ Asian British
Asian or Asian British – Bangladeshi	Asian/ Asian British
Asian or Asian British – Any other Asian background	Asian/ Asian British
Black or Black British – Caribbean	Black/ African/ Caribbean/ Black British
Black or Black British – African	Black/ African/ Caribbean/ Black British
Black or Black British – Any other Black background	Black/ African/ Caribbean/ Black British
Other ethnic groups – Chinese	Other ethnic group
Other ethnic groups – Any other ethnic group	Other ethnic group
Not stated	Not stated/ not known
Not known	Not stated/ not known

For the IAF the same approach is used, but for the Asian group, the larger sub groups: Indian, Pakistani and Bangladeshi are provided and for the Black group the larger subgroups of African and Caribbean are provided. These larger sub groups are as shown in the left column of the table above. The mixed groups, Chinese and Arab groups and Other ethnicity groups are combined into Other.

For both IAF indicator 106a and IAPT data, for some records the ethnicity of the patient is recorded as unknown. We do not know if hospitalisations where the ethnicity of the patient is unknown are

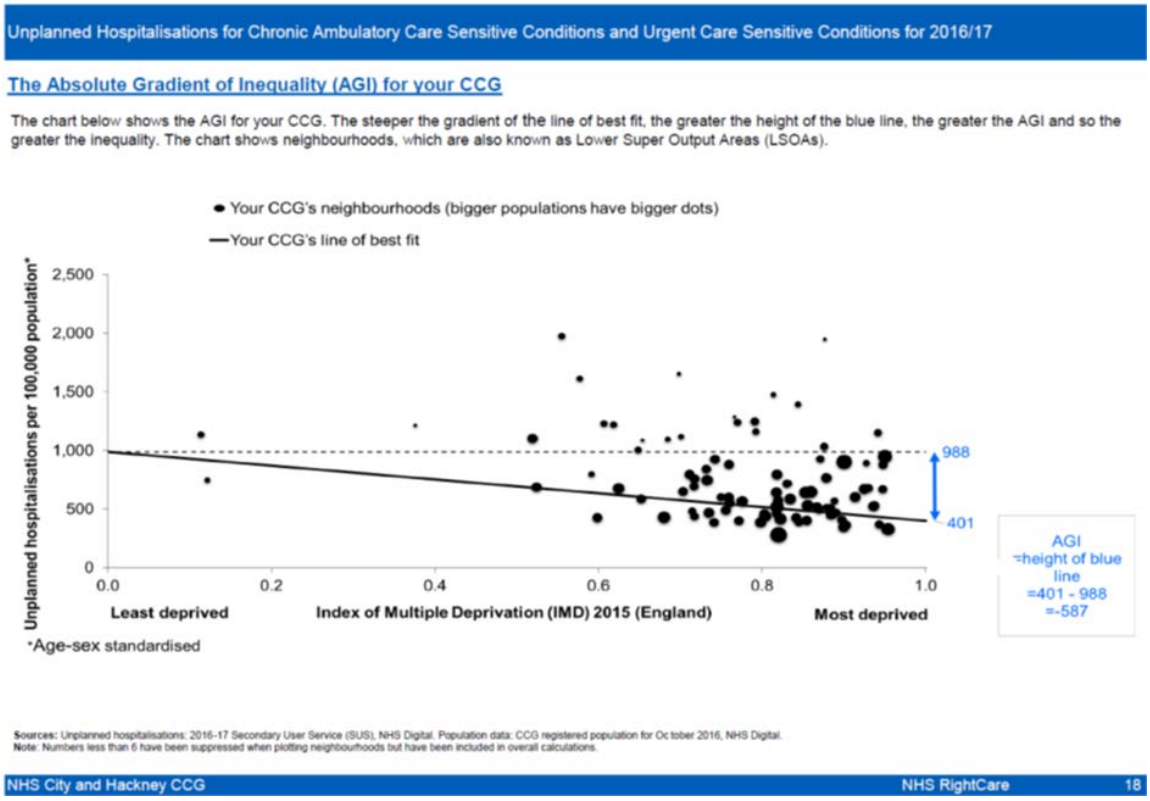
split disproportionately across ethnic groups or if one ethnic group has a higher share of the hospitalisations of unknown ethnicity than another.

For each ethnic group, the comparability between a CCG's rate and its benchmark rate will depend upon the proportion of hospitalisations of unknown ethnicity for the CCG and the proportion for its benchmark. For each ethnic group the more comparable the proportion unknown for the CCG and the proportion unknown for its benchmark, the more comparable the hospitalisations rates between the CCG and its benchmark will be.

A limitation of hospitalisation rates and IAPT referral and recovery rates by ethnic group is that they are constructed by dividing the numerators, whether unplanned hospitalisations, IAPT referrals or IAPT recoveries, by the population for each ethnic group, and the population of each ethnic group has been estimated. Population estimates by ethnic group are derived by applying 2011 Census ethnic group splits[12] at a detailed level to 2016/17 CCG registered population numbers.

Understanding a negative Absolute Gradient of Inequality

The charts below show the two CCGs with negative Absolute Gradients of Inequality.

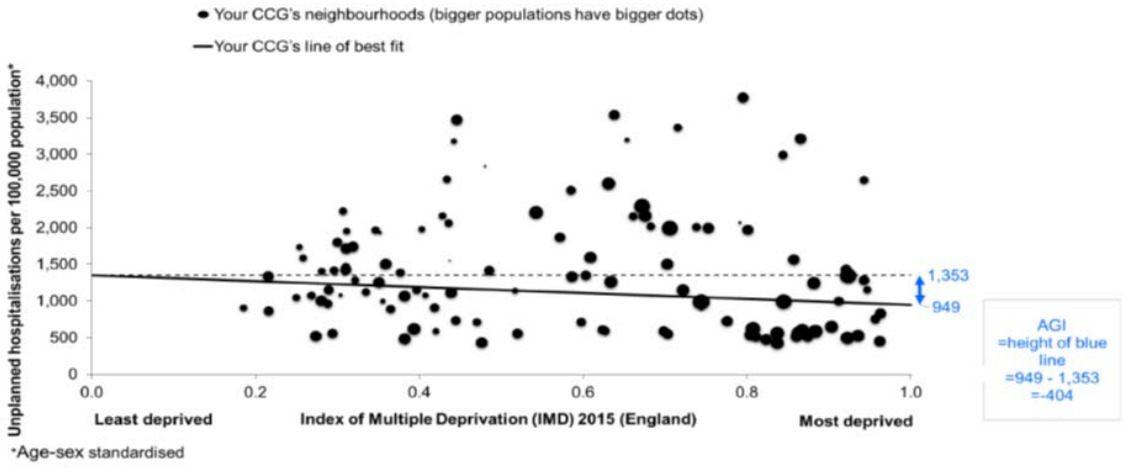


[12] That is population numbers from the 2011 Census mapped on to 2001 Census ethnic groups, as IAF 106a or IAPT numerators use the 2001 Census ethnic groups classification.

Unplanned Hospitalisations for Chronic Ambulatory Care Sensitive Conditions and Urgent Care Sensitive Conditions for 2016/17

The Absolute Gradient of Inequality (AGI) for your CCG

The chart below shows the AGI for your CCG. The steeper the gradient of the line of best fit, the greater the height of the blue line, the greater the AGI and so the greater the inequality. The chart shows neighbourhoods, which are also known as Lower Super Output Areas (LSOAs).



Sources: Unplanned hospitalisations: 2016-17 Secondary User Service (SUS), NHS Digital. Population data: CCG registered population for October 2016, NHS Digital.
Note: Numbers less than 6 have been suppressed when plotting neighbourhoods but have been included in overall calculations.

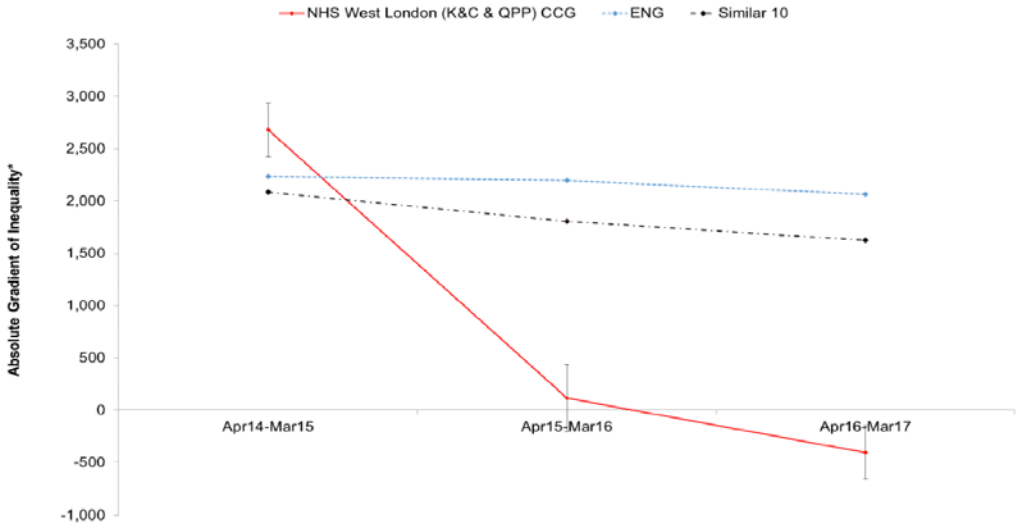
NHS West London (K&C & QPP) CCG NHS RightCare 18

These charts reflect higher hospitalisations for the less deprived. This is not equality but in some sense reverse inequality or a worse situation for those with lower deprivation. True equality would mean an AGI of zero and no gradient in rates of unplanned hospitalisations with deprivation either way. This has interesting implications for change over time:

Unplanned Hospitalisations for Chronic Ambulatory Care Sensitive Conditions and Urgent Care Sensitive Conditions

Time Series for your CCG's Inequality compared with your Similar 10 and England

The current and previous levels of inequality for your CCG are shown by the solid line on the line chart. The 95% confidence interval error bars illustrate the uncertainty in the measure of inequality. The England average, and the average of the Similar 10 are also shown as benchmarks.



Sources: Unplanned hospitalisations - Secondary User Service (SUS) 2016/17, 2015/16, and 2014/15 (where available), NHS Digital, population data - CCG registered population, October 2016, NHS Digital.
Note: * Difference in age sex standardised rates of unplanned hospitalisation per 100,000 population between the most and least deprived neighbourhoods in England if England had the same inequality as the CCG.

NHS West London (K&C & QPP) CCG NHS RightCare 21

Inequality may be regarded as the absolute size of the AGI. So, for the chart above, over the three years shown there is first narrowing inequality followed by widening (if negative) inequality.

Revisions to Secondary Uses Service data

Since the production of these packs, the underlying hospitalisation data (Secondary Uses Services data) for 2016-17 have been revised. This is the nature of SUS data and because of these revisions, the Absolute Gradient of Inequality (AGI) for Unplanned Hospitalisations for Chronic Ambulatory Care Sensitive Conditions and Urgent Care Sensitive Conditions[1] has changed for all CCGs. The extent of these changes is small, generally less than 3%.

However, there are a few CCGs with substantial change. These CCGs are: NHS Thurrock CCG, NHS Basildon and Brentwood CCG, NHS Crawley CCG, NHS East Surrey CCG, and NHS Horsham & Mid Sussex CCG. For this reason, these packs do not include analyses of unrevised data.

CCGs having these in their “similar 10”” will have benchmarks based upon data where one or potentially more CCGs have substantially changed in the light of revised data.