Academic Health Science Network
North East and North Cumbria

Campaign to Reduce Opioid Prescribing in the North East & North Cumbria (CROP-NENC):

Quantitative analysis of data from Open Prescribing

Executive Summary

- The Campaign to Reduce Opioid Prescribing in the North East & North Cumbria (CROP-NENC) scheme replicated a previously successful Yorks & Humber Region programme by encouraging reduction in opiate prescription thought the provision of seven bi-monthly reports of practice opiate prescribing practice together with graphical representations of their comparators plus suggestions for action.
- Qualitative and Semi-quantitative feedback on the programme has previously been sought and suggested the scheme was positively received but may have had little impact due to COVID and pre or co-occurring similar schemes.
- Monthly opioid prescribing data (items/1,000 patients) were extracted from Open Prescribing for each GP practice in the North East and North Cumbria, merged with demographic data from the NHS fingerprints service and analysed.
- Gabapentinoid prescribing appears relatively stable but number of items of duloxetine prescribed is significantly increasing year on year. It does not appear that this increase has been accelerated by the CROP intervention.
- This analysis will have been insensitive to prescribing changes such as dose reduction or change of medication and only capable of detecting the largest changes in prescribing practice (which according to the qualitative study may already have occurred) and it is unclear (from the user feedback) how many practices engaged with the reports.
- Baseline opioid, gabapentin and duloxetine prescription appears to be higher in practices which are relatively high in the proportion of female patients, the proportion of patients registered to have a chronic illness and particularly in those practices which are more deprived (as measured by the practice IMD).
- When looked at in detail there are no significant effects of the scheme on the number of items prescribed classed as strong or weak opioids or opioids co-prescribed with paracetamol and no significant differences between CCGs for any of these.
- It is suggested that if the programme is to continue then lower level data (such as total opioids as expressed in terms of morphine equivalent) be recorded and analysed in order to detect smaller or more subtle changes and that intervention could also focus on practices where the largest changes are yet to be made (e.g. areas of high deprivation) or evaluation could be tied in with existing and ongoing CCG based schemes.
- There is an apparent year on year reduction in total opioids prescribed across the region but this is a very small effect and is non-significant once analysis includes practice demographics and takes account of the CCG groupings, though this positive "direction of travel" is maintained for most CCGs.

Background to study

Opioids for chronic non-cancer pain are known to be ineffective for most people when used long-term (90+ days). It is also known that prescribing opioids for 90+ days is linked with increased risk of dependence and overdose. People living in the North East are more likely to be prescribed these medicines for 6+ and 12+ months than in all other regions, indeed, the North East & North Cumbria have the highest rate of opioid prescribing in England.

The aim of the Campaign to Reduce Opioid Prescribing (CROP) was to promote the review of opioid analgesic prescribing within primary care and to support practices with this work.

The programme essentially replicated a successful campaign undertaken in the Yorks & Humber Region (Alderson et al 2021; Wood et al, 2021) and their support was commissioned in the production of practice reports. Practices received seven bi-monthly updates on the prescribing of opioids for chronic non-cancer pain within their practice. The reports were based on searches, which were designed to understand how many prescriptions of both strong and weak opioids are dispensed and which displayed in a graphical format comparing the practice data to their local comparators. Unfortunately, in comparison with the earlier study the multiple CCG implementation here and issues with the proprietary nature of searches meant that the volume of opioid data that was reported to prescribers in the reports could not be made available to the evaluators of the scheme and so a similar quantitative evaluation approach could not be replicated. However data was available via OpenPrescribing and this report includes an analysis of the available data at the level of number of items prescribed per month normalised by GP practice list size.

The objective was to encourage a reduction in inappropriate prescribing of high dose opiate prescribing for non-cancer pain. In addition, this iteration of CROP reports included coverage of gabapentinoids as it was felt that these substances were often co-prescribed with opiates and were similarly considered likely to cause issues in the same patient groups.

As previously reported qualitative feedback, though limited in quantity, was enthusiastic about the scheme and felt it could play a role in reducing overuse of opioids providing suitable alternatives were provided. A note of caution was raised in the qualitative feedback about the fear of an increase in duloxetine prescribing and so rates of the prescription of this drug are also analysed here.

Analysis

Only a small number of practices self-excluded from the intervention and these were scattered across differing CCG groups therefore it has not been possible to construct a meaningful and appropriate control group. The only appropriate analysis is to determine if there is a change across time from before, during and after the intervention. Limited time following the end of the intervention and delays in publication of Open Prescribing data mean the post intervention period is limited to the three months following the end of the intervention. Therefore, a strategy of comparing comparative three-month periods from baseline, before the start, just before the end and post intervention was decided upon.

The three-month periods are

- **Baseline** – June to August 2019
- **Start** – June to August 2020 (covering the time up to and including the first report)
- **End** – June to August 2021 (covering the final three months of the intervention including receiving the final report)
- **Post** – September to November 2021

The first three time periods are the same calendar months each year to avoid seasonal effects, of course the only available complete 3-month period of data post intervention at the date of data extraction (end January 2022) is different in this respect. In each case the variable extracted from Open Prescribing is the number of items prescribed/1,000 patients on list.

It must be noted at the outset that this is a relatively insensitive indicator as it will not reflect changes in dosage or substitution of one drug for another. Consideration was given to analysing practice spend (which is also available normalised by list size) however given the relatively long period of observation and the unknown influence of inflation this approach was abandoned as being unlikely to yield useful results.

Given that it is known that individual CCGs had other and ongoing opioid reduction programmes in progress it was felt best to analyse the data at a practice level but grouped by CCGs in the first instance. A series of mixed factorial ANCOVAs were performed with time period as the repeated measures variable and CCG as the grouping variable. As in the original analysis by the team for Leeds a number of covariates were included to account for pre-existing differences between the practices.

These variables were:

- Proportion of the practice recorded as Female
- Proportion of the practice recorded as having a long-term health condition
- Proportion of the practice satisfied with service
- Proportion of the practice aged 75 and above (over 75)
- Index of multiple deprivation reported for practice (IMD)

All data regarding prescription volumes were downloaded from Open Prescribing[1] using BNF code sections 4.7.2 and subsections for specific drugs as specified below. GP practice data was extracted from the National General Practice Profiles "Fingertips" service[2]. Data was merged and preliminary analysis / averaging performed using custom written scripts in Visual Studio 2022. Further analysis was performed using IBM SPSS 27.0. Data is presented as means with standard deviation / standard error or 95% confidence intervals as appropriate. Relationships between scale variables are shown as Kendall-tau bivariate correlations. In the analyses of covariance presented full reporting of the statistics for the covariates is not included for the sake of brevity and where Mauchly's test suggests the assumption of sphericity has been violated the Greenhouse-Geisser estimate of sphericity has been used to correct the degrees of freedom for that part of the analysis as appropriate without further comment.

1 OpenPrescribing.net, EBM DataLab, University of Oxford, 2020 2 https://fingertips.phe.org.uk/profile/general-practice

Results

Descriptive statistics for each of the covariates plus baseline total opiate prescribing is shown in table 1. Here for total opioid prescribing all items which were coded under BNF section 4.7.2 as reported by Open Prescribing were included.

Table 1. Descriptive statistics of baseline opioid prescribing rates and covariates for each included CCG

		Median	Mean	S.D.	Min	Max
Baseline Monthly Total Opioids: items / 1,000 May-Aug 2019	DU	617.00	734.87	502.80	126.33	2282.33
	NG	565.67	625.16	405.29	45.00	1929.33
	NC	269.67	424.49	412.49	13.67	1955.00
	NT	537.00	635.44	346.81	204.00	1569.33
	NU	387.00	545.80	486.90	51.67	2373.33
	ST	457.33	530.92	287.76	189.33	1465.33
	SU	551.33	604.35	333.91	26.67	1522.33
	TV	547.00	623.58	359.24	9.67	1687.33
Proportion Female	DU	0.51	0.50	0.01	0.47	0.52
	NG	0.50	0.49	0.03	0.39	0.53
	NC	0.50	0.50	0.01	0.47	0.52
	NT	0.51	0.51	0.01	0.48	0.52
	NU	0.51	0.51	0.01	0.48	0.52
	ST	0.50	0.49	0.03	0.40	0.53
	SU	0.50	0.48	0.09	0.00	0.53
	TV	0.50	0.50	0.03	0.26	0.53
Percentage Health Condition	DU	57.14	57.89	6.39	46.83	75.07
	NG	52.79	53.03	8.18	36.77	73.17
	NC	54.25	54.60	5.70	44.15	69.76
	NT	55.76	55.23	6.97	41.26	69.86
	NU	56.88	57.27	6.93	41.60	70.83
	ST	56.55	55.16	6.02	40.59	66.46
	SU	59.19	58.67	5.84	44.45	67.35
	TV	56.71	56.69	8.16	38.13	76.76
Satisfaction with practice (%)	DU	89.34	87.37	8.81	54.45	98.45
	NG	87.59	85.98	7.99	63.32	99.56
	NC	91.11	88.03	9.94	58.00	99.55
	NT	88.38	87.51	5.55	75.89	100.00
	NU	91.58	89.49	6.65	73.90	98.67
	ST	90.39	88.01	6.78	72.92	97.46
	SU	88.05	87.81	5.30	78.93	99.01
	TV	85.24	84.54	8.01	62.12	97.65
Percentage Practice Aged >75	DU	9.04	9.25	2.11	4.01	14.73
	NG	7.12	7.41	2.87	0.38	13.52
	NC	10.57	10.74	1.71	8.20	14.38
	NT	8.51	8.79	2.22	4.48	13.19
	NU	11.61	11.50	2.08	7.84	15.26
	ST	8.94	8.86	1.62	5.80	12.74
	SU	8.48	8.36	1.88	4.70	12.11
	TV	8.16	85	2.71	0.07	15.58
IMD (practice)	DU	26.45	26.96	8.44	9.71	43.30
	NG	32.47	29.53	11.59	9.07	58.85
	NC	20.57	20.83	5.59	12.63	31.14
	NT	20.89	21.41	8.49	9.99	44.01
	NU	20.09	19.94	6.98	8.74	36.93
	ST	32.99	31.79	6.37	16.60	38.81
	SU	30.73	30.96	5.82	19.34	44.44
	TV	31.92	32.91	11.83	8.50	67.41

Abbreviations

DU – Durham, NG – Newcastle Gateshead, NC – North Cumbria, NT – North Tyneside, NU – Northumberland, ST – South Tyneside, SU – Sunderland, TV – Tees Valley

Table 2 demonstrates the relationships between each of the covariates and baseline total opiate prescribing. As expected, baseline total opioid prescribing is significantly positively related to practice deprivation (IMD), proportion of practice with a chronic health condition and proportion of practice being female and is negatively related to perceived satisfaction with practice.

The relationship between baseline opioids and proportion of elderly in the practice appears significant and negative but care should be taken here considering the strong negative relationship between IMB and proportion of elderly in the practice – this could be being confounded by the known relationship between mortality rates and IMD. The significant relationships with the baseline suggests that as in the Leeds analysis these factors should be included in analysis as probable covariates.

Descriptive statistics for each of the covariates plus baseline total opiate prescribing is shown in table 1. Here for total opioid prescribing all items which were coded under BNF section 4.7.2 as reported by Open Prescribing were included.

Overall prescribing – all drugs classified under BNF 4.7.2

Across the four time periods simply looking at total opiate prescribing (items / 1,000) across all involved practices there is an apparent decrease in total prescribing across time $F(1.44, 496.5) = 12.4$, $p<.001$. Post hoc testing (Bonferroni, $p<.05$) indicates that there is no significant difference between baseline and start period but the remaining two time periods are each significantly lower than the one before.

Whilst this would suggest some sort of effect of the CROP intervention at the most basic level it must be noted that (1) a decline was apparent before the intervention and (2) this does not include or consider the effects of differences between practices or between CCGS or adjust for any of the covariates.

When the analysis is repeated including the covariates, there is no significant difference in opioid prescribing across time period $F(1.43, 486.7) = 0.33$, $p=0.80$ with the means adjusted for the covariates are as shown in the right columns of table 3.

Dividing the practices by CCG, a 4 (time) x 8 (CCG) mixed Analysis of Covariance was performed to ascertain if total prescribing varied across time by CCG. There is no main effect of time $F(1.43,474.5) = 0.09$, $p=0.97$; no overall difference between CCGs $F(7,333) = 1.86$, $p=0.08$ and no interaction between CCG and time period $F(9.97, 474.5) = 1.35$, $p=0.20$.

Adjusted means with 95% Confidence intervals are shown in table 4 and figure 1. Whilst there appears to be a moderate decline in total opioid prescribing in most CCGs it is notable that the confidence intervals are extremely wide suggesting considerable differences between practices even after including the covariates and suggesting a more detailed and practice based approach would be needed to understand the effects of CROP.

Table 2. Kendall-tau correlations between baseline total opioids prescribed and covariates included in analysis

	1	2	3	4	5
1 baseline	-				
2. Prop Female	0.12**	-			
3. Health	0.19**	0.05	-		
4. Over75	-0.09**	0.20**	0.07*	-	
5. Satisfaction	-0.25**	0.09**	-0.13**	0.13**	
6. IMD	0.22**	-0.24**	0.16**	-0.39**	-0.2**

Note: * p<0.05; **p<0.01

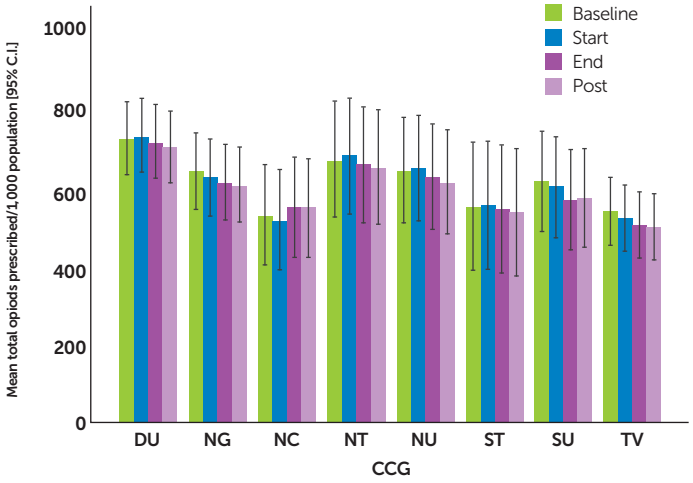
Table 4. Mean (S.E.) total opioids prescribed (items/1,000) rounded to whole number across each time period and CCG

	Baseline	Start	End	Post	Total
DU	719 (47)	726 (47)	711 (47)	698 (47)	714
NG	637 (49)	621 (49)	609 (49)	603 (48)	617
NC	525 (65)	512 (65)	546 (64)	544 (64)	532
NT	666 (75)	675 (75)	653 (75)	649 (74)	661
NU	639 (68)	646 (68)	623 (68)	609 (67)	629
ST	547 (82)	549 (83)	541 (83)	532 (82)	542
SU	610 (64)	595 (65)	565 (64)	568 (64)	584
TV	534 (43)	518 (43)	500 (43)	496 (42)	512
Totals	610	605	593	587	599

Table 3. Raw and adjusted prescribing rates (items/1,000 list) across the four time periods

	Raw Rates		Adjusted Rates	
	Mean items	95% C.I.	Mean items	95% C.I.
Baseline (2019)	609.6	566.0 – 653.1	611.3	572.4 – 650.1
Start (2020)	602.9	559.2 – 646.6	604.5	565.4 – 643.6
End (2021)	590.4	547.2 – 633.6	592.1	553.2 – 631.0
Post	583.9	541.3 – 626.5	585.6	547.2 – 624.0

Figure 1. Mean (95% C.I.) total opioids prescribed by CCG and time period



Strong Opiates

These were as defined in the original study and comprised BNF codes for: diamorphine, dipipanone, fentanyl, hydromorphone, morphine, morphine preparations – other, oxycodone, papaverine and pentazocine. All data for these drugs were downloaded from Open Prescribing and analysed as detailed above.

Dividing the practices by CCG, a 4 (time) x 8 (CCG) mixed Analysis of Covariance was performed to ascertain if total prescribing varied across time by CCG. There is no main effect of time F(1.22,407.4) = 0.29, p=0.84; no overall difference between CCGs F(7,334) = 1.43, p=0.24 and no interaction between CCG and time period F(8.54, 407.4) = 1.65, p=0.10. Adjusted means with 95% Confidence intervals are shown in table 5 and figure 2.

Weak Opiates

These again are as defined by the Leeds group and comprised BNF codes for: codeine, dihydrocodeine, tramadol, pethidine, meptazinol, and tapentadol. All data for these drugs were downloaded from Open Prescribing and analysed as detailed above

Dividing the practices by CCG, a 4 (time) x 8 (CCG) mixed Analysis of Covariance was performed to ascertain if total prescribing varied across time by CCG. There is no main effect of time F(1.21, 399.1) = 0.35, p=0.60; and no interaction between CCG and time period F(8.44, 399.1) = 1.11, p=0.36. There is a an overall marginally significant difference between CCGs F(7,334) = 2.4, p=0.02 however once correction for repeated testing has been applied no significant differences remain between CCGs– though it does appear that prescription rates vary for weaker opiates more across the CCGs than for other drug classes (see totals column table 6) and this may be worth further investigation. Adjusted means with 95% Confidence intervals are shown in table 6 and figure 3.

Table 5. Mean (S.E.) strong opioids prescribed (items/1,000) rounded to whole number across each time period and CCG

	Baseline	Start	End	Post	Total
DU	247 (18)	240 (18)	231 (20)	230 (20)	237
NG	210 (19)	202 (18)	201 (21)	206 (21)	205
NC	172 (25)	173 (24)	194 (27)	195 (28)	184
NT	236 (29)	235 (28)	223 (32)	228 (32)	230
NU	243 (25)	242 (25)	264 (28)	261 (29)	253
ST	171 (31)	167 (31)	172 (35)	172 (35)	168
SU	199 (25)	191 (27)	176 (27)	181 (27)	187
TV	213 (16)	201 (16)	188 (18)	191 (18)	198
Totals	211	206	205	208	207

Table 6. Mean (S.E.) weak opioids prescribed (items/1,000) rounded to whole number across each time period and CCG

	Baseline	Start	End	Post	Total
DU	480 (32)	474 (32)	463 (36)	465 (36)	417
NG	435 (34)	410 (33)	396 (37)	403 (37)	411
NC	358 (44)	343 (43)	366 (49)	373 (49)	360
NT	442 (51)	433 (50)	418 (57)	423 (57)	429
NU	456 (46)	447 (45)	482 (50)	483 (51)	467
ST	390 (57)	380 (55)	365 (62)	379 (63)	379
SU	420 (46)	392 (45)	376 (51)	383 (51)	393
TV	320 (29)	310 (29)	300 (32)	306 (33)	309
Totals	413	399	396	402	402

Figure 2. Mean (95% C.I.) strong opioids prescribed by CCG and time period

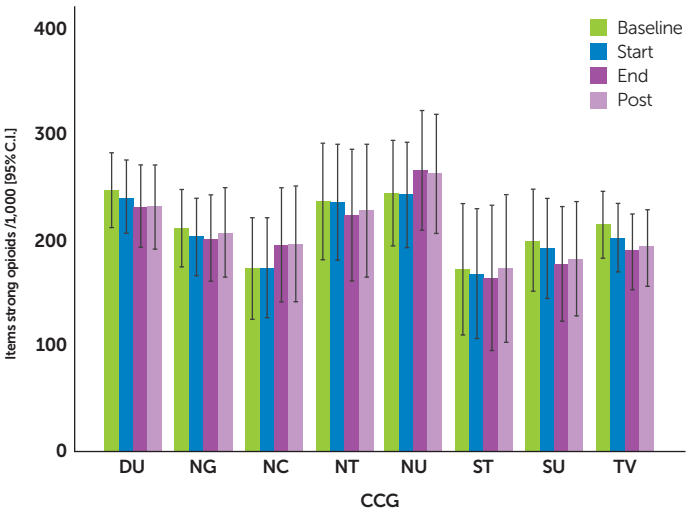
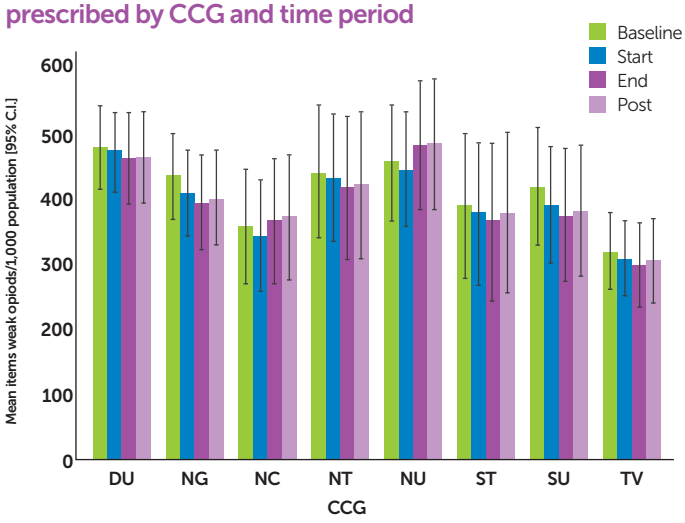


Figure 3. Mean (95% C.I.) weak opioids prescribed by CCG and time period



Weak Opiates prescribed with paracetamol

Here those opiates prescribed in combination with paracetamol were separated out and analysed as a sub group.

Dividing the practices by CCG, a 4 (time) x 8 (CCG) mixed Analysis of Covariance was performed to ascertain if total prescribing varied across time by CCG. There is no main effect of time F(1.21, 410.26) = 0.31, p=0.82; and no interaction between CCG and time period F(8.45, 410.26) = 1.11, p=0.35. There is a an overall marginally significant difference between CCGs F(7,340) = 2.4, p=0.018 however once correction for repeated testing has been applied this appears to be solely due to the prescription rate in TV being significantly lower than the rate in DU with all other rates being non significantly different and between these two extremes. Adjusted means with 95% Confidence intervals are shown in table 7 and figure 4. It is very noticeable here that prescribing rates and patterns of change are extremely similar between drugs classed as weak opioids and those classed as opioids in combination with paracetamol.

Gabapentinoids

Table 8 demonstrates the relationships between each of the covariates and baseline gabapentinoid prescribing. Again, as expected baseline total gapapentinoid prescribing is significantly positively related to practice deprivation (IMD), proportion of practice with a chronic health condition and proportion of practice being female and is negatively related to perceived satisfaction with practice. The relationship between baseline gapapentinoids and proportion of elderly in the practice appears significant and negative but care should be taken here considering the strong negative relationship between IMB and proportion of elderly in the practice – this could be being confounded by the known relationship between mortality rates and IMD. Overall, these relationships are in the same direction but of slightly greater magnitude than the relationships with baseline total opioid prescribing.

Dividing the practices by CCG, a 4 (time) x 8 (CCG) mixed Analysis of Covariance was performed to ascertain if total prescribing varied

Table 7. Mean (S.E.) weak opioids with paracetamol prescribed (items/1,000) rounded to whole number across each time period and CCG

	Baseline	Start	End	Post	Total
DU	479 (32)	473 (31)	463 (35)	464 (35)	470
NG	433 (34)	409 (33)	395 (37)	401 (37)	410
NC	358 (44)	344 (43)	366 (48)	373 (49)	360
NT	442 (51)	433 (50)	417 (56)	422 (56)	428
NU	454 (44)	444 (42)	479 (48)	479 (48)	464
ST	402 (55)	393 (53)	377 (60)	390 (61)	391
SU	412 (43)	387 (42)	369 (48)	376 (48)	386
TV	318 (29)	308 (28)	298 (32)	304 (32)	307
Totals	412	399	395	401	402

Figure 4. Mean (95% C.I.) weak opioids with paracetamol prescribed by CCG and time period

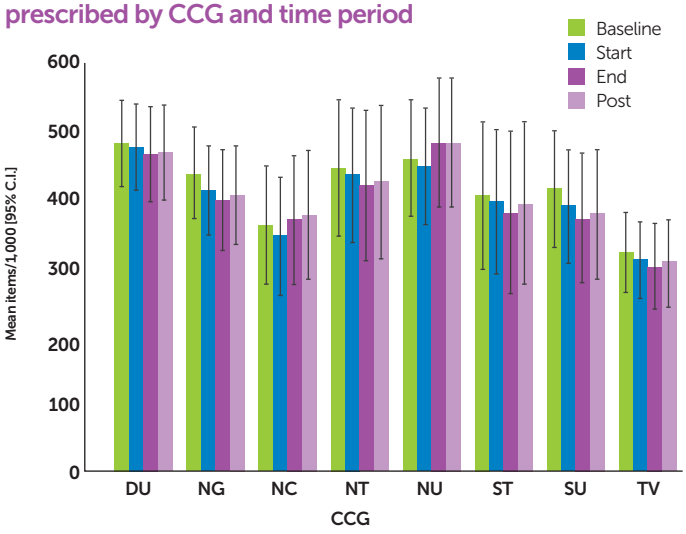


Table 8. Kendall-tau correlations between baseline gabapentinoids prescribed and covariates included in analysis. PropF = proportion of practice who are female

	1	2	3	4	5
1. GABA items	-				
2. PropF	0.18**	-			
3. Health	0.23**	0.05	-		
4. Over75	-0.11*	0.20**	0.07*	-	
5. Satisfaction	-0.30**	0.09**	-0.13**	0.13**	
6. IMD	0.26**	-0.24**	0.16**	-0.39**	-0.2**

Note: * p<0.05; **p<0.01

across time by CCG. There is no main effect of time F(1.27, 409.78) = 0.17, p=0.91 and no difference between CCGs F(7,334) = 1.71, p=0.10; There is a marginally significant interaction between CCG and time period F(8.59, 409.78) = 2.07, p=0.34 – referring to the plot below this appears to be due prescribing rates being essentially flat across the time period in all CCGs apart from in North Cumbria where there is an increase in the latter two time periods. Adjusted means with 95% Confidence intervals are shown in table 9 and figure 5.

Duloxetine

Table 10 demonstrates the relationships between each of the covariates and baseline duloxetine prescribing (Kendall-tau correlation as each data set was markedly non normal). Again, as expected baseline total duloxetine prescribing is significantly positively related to practice deprivation (IMD), proportion of practice with a chronic health condition and proportion of practice being female and is negatively related to perceived satisfaction with practice.

The relationship between baseline duloxetine and proportion of elderly in the practice appears significant and negative but care should be taken here considering the strong negative relationship between IMB and proportion of elderly in the practice – this could be being confounded by the known relationship between mortality rates and IMD. Overall, these relationships are in the same direction and of similar magnitude to the relationships with baseline total opioid and gabapentioid prescribing.

Dividing the practices by CCG, a 4 (time) x 8 (CCG) mixed Analysis of Covariance was performed to ascertain if total prescribing varied across time by CCG. There is a main effect of time F(1.36, 451.43) = 6.59, p=0.005 and a significant difference between CCGs F(7,334) = 3.08, p=0.004; There is no significant interaction between CCG and time period F(9.46, 451.43) = 1.65, p=0.10. Adjusted means with 95% Confidence intervals are shown in table 11 and figure 6. Here it appears that there is a significant increase in duloxetine prescribing across time with Bonferroni corrected post-hoc comparisons indicating that prescribing rates are significantly higher in each time period than the one preceding it. The difference between CCGs appears to be due to overall rates being lower for North Cumbria than Newcastle-Gateshead with all other differences between being non-significant.

In order to attempt to determine if changes in duloxetine prescription rates were related to the CROP intervention as suggested in the qualitative feedback obtained, for each practice a change in number of items duloxetine prescribed was calculated for the year prior to the start of the CROP intervention and for the year from end to the start of the intervention and these were examined using a 2 (time period) x 8 (CCG) analysis of covariance with the standard covariates included. In these results a positive value indicates an increased number of items prescribed across the year.

Table 9. Mean (S.E.) items gabapentinoids prescribed (items/1,000) rounded to whole number across each time period and CCG

	Baseline	Start	End	Post	Total
DU	388 (25)	389 (25)	397 (28)	406 (29)	395
NG	346 (26)	333 (27)	327 (30)	331 (30)	334
NC	269 (35)	274 (35)	318 (39)	325 (40)	296
NT	339 (40)	329 (41)	329 (45)	336 (46)	333
NU	307 (36)	294 (36)	331 (40)	331 (41)	315
ST	237 (44)	234 (45)	235 (50)	246 (51)	238
SU	322 (35)	326 (35)	300 (39)	305 (40)	313
TV	301 (23)	305 (23)	308 (26)	314 (26)	307
Totals	314	311	318	324	317

Figure 5. Mean (95% C.I.) gabapentinoids prescribed by CCG and time period

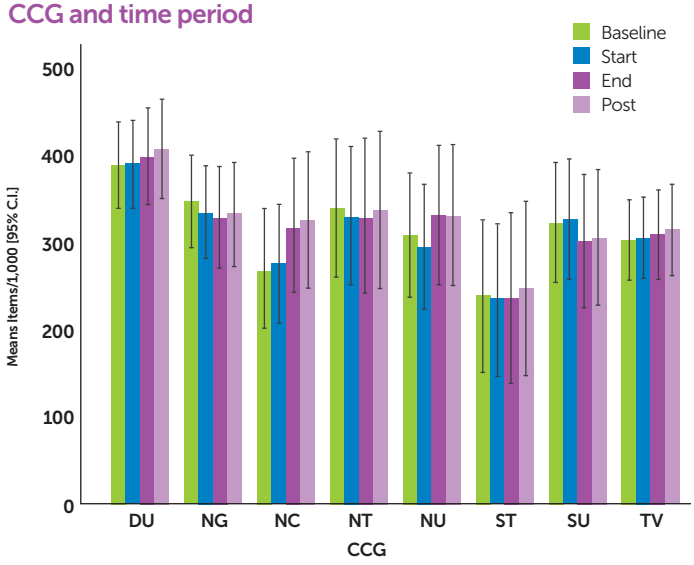


Table 10: Kendall-tau correlations between baseline duloxetine and covariates included in analysis. PropF = proportion of practice who are female

	1	2	3	4	5
1. Duloxetine items	-				
2. PropF	0.15**	-			
3. Health	0.15**	0.05	-		
4. Over75	-0.18**	0.20**	0.07*	-	
5. Satisfaction	-0.24**	0.09**	-0.13**	0.13**	
6. IMD	0.23**	-0.24**	0.16**	-0.39**	-0.2**

Note: * p<0.05; **p<0.01

As detailed in figure 7 once covariates are included in the model there is no significant overall change in rate of prescribing across the time periods F(1,334) = 0.03, p = 0.87 with a mean increase of 8.3 [6.2 – 10.3] items prior to CROP compared to 14.4 [11.6 – 27.3] items across the CROP period.

There is no significant difference in overall change between CCG F(7.334) = 1.66, p=0.12 but there is a significant interaction between CCG and time period F(7, 334) = 2.54, p=0.015 with some CCGs showing an increased rate of change of duloxetine prescribing during the CROP period compared with the previous year – this is particularly seen for Northumberland and also to a lesser extent for Durham. Overlapping confidence intervals suggest all other differences are non-significant.

Table 11. Mean (S.E.) items duloxetine prescribed (items/1,000) rounded to whole number across each time period and CCG

	Baseline	Start	End	Post	Total
DU	83 (7)	90 (8)	108 (9)	112 (9)	98
NG	90 (9)	99 (8)	108 (9)	115 (10)	103
NC	47 (9)	51 (10)	67 (12)	69 (13)	58
NT	87 (11)	93 (12)	105 (14)	108 (15)	98
NU	72 (9)	81 (11)	110 (13)	111 (13)	94
ST	59 (12)	63 (13)	78 (16)	81 (16)	71
SU	64 (9)	81 (10)	92 (12)	93 (13)	83
TV	57 (6)	66 (7)	74 (8)	78 (9)	69
Totals	70	78	92	96	84

Figure 6. Mean (95% C.I.) duloxetine prescribed by CCG and time period

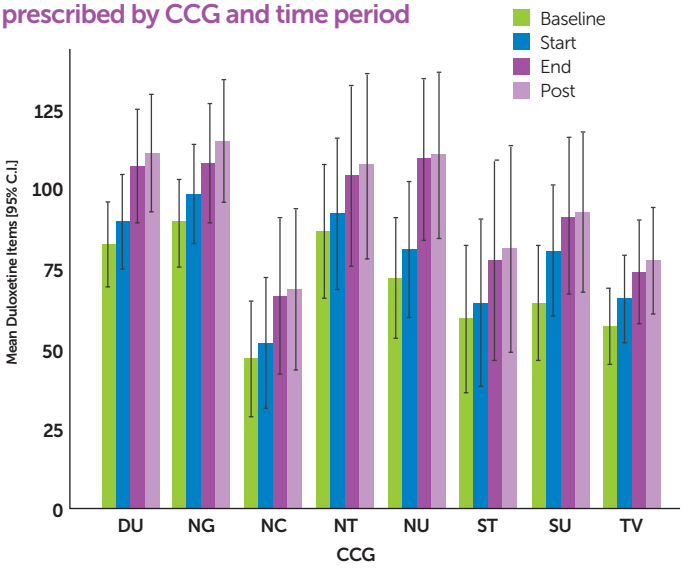
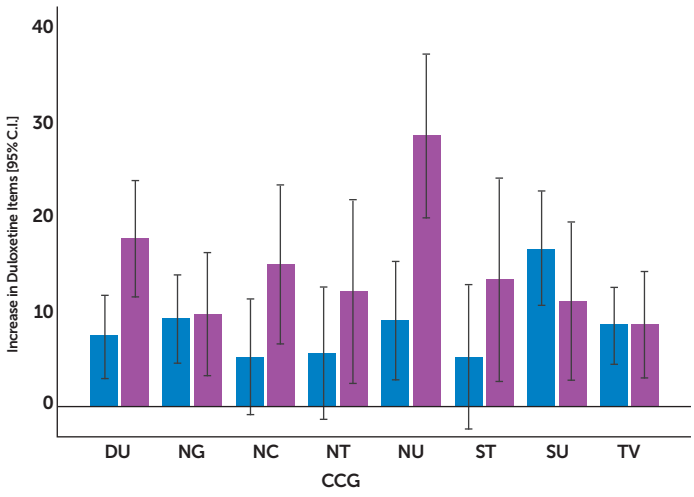


Figure 7. Mean (95% C.I.) change in duloxetine items prescribed by CCG for the year prior to and the year of the CROP intervention



Discussion

This analysis of opioid prescribing volume using data extracted from Open Prescribing unfortunately fails to demonstrate any strong signal of the CROP campaign being effective – at least in terms of overall number of items prescribed.

Across the entre 8 CCGs there is a very crude year on year decrease in total items prescribed under BNF section 4.7.2 however this trend is apparent prior to the beginning of the CROP intervention but this difference is non significant once necessary covariates and the fact that there are 8 separate CCGs considered in the analysis.

There are similarly no significant changes across time demonstratable when looking at the levels of strong opioids, weak opioids, opioids co-prescribed with paracetamol or gabapentinoids. There is evidence of an increasing year on year rise in prescription of duloxetine but, contrary to fears raised in the qualitative study this does not seem to have been accelerated by the CROP intervention.

There does appear when looking at the graphs for total opiate use by CCG to be some suggestion that most CCGs have at least a suggestion of the right direction of travel with an – albeit non-significant – trend towards reduction in total items prescribed. This pattern however does not really hold when looking at strong and weak opioids individually. It is entirely possible (as was suggested in the qualitative feedback) that opioid reduction has been an ongoing issue for a number of years with those practices likely to engage and those patients easy to manage already moving in the right direction and therefore the measurable effect of the CROP intervention will be small. It is also to be noted that other ongoing different interventions were occurring in different CCG and possibly a more in depth analysis at a lower level may reveal significant changes.

Overall, the prescribing of gabapentinoids appears relatively flat and while duloxetine prescribing is increasing, the rate of this does

not appear to have been accelerated by the CROP campaign.

The extent of practice engagement with the CROP intervention needs also to be questioned. Given that only 34 responses to the qualitative feedback request were received it is possible that for many practices the CROP reports had little or no impact as they were not engaged with. The fact that this intervention has co-occurred with the COVID pandemic obviously will have hindered engagement. It would perhaps be ideal to be able to analyse the practices that definitely engaged with the process in order to determine if an impact occurred on them but the feedback process being anonymous precludes this.
A serious difficulty which may be preventing this analysis from demonstrating an effect of the intervention relates to the data sources available. Due to the large numbers of CCGs involved and issues with data protection the evaluation team (unlike at Leeds) were not able to be provided with the data that the practices received and which was broken down in the most useful way. Instead data was extracted from Open Prescribing and here breakdown was limited to grouping by BNF code and being constrained to the level of number of items prescribed. This analysis is obviously insensitive to opioid reduction strategies such as dose reduction or change in drug prescribed and would only be capable of detecting quite large changes in prescribing behaviour – and as many of the qualitative responses suggested, these may have already occurred.

Conclusions and suggestions for future work

There is no strong quantitative evidence of a change in opioid prescription practice as measurable by changes in volumes of items prescribed and recorded in the Open Prescribing data base in response to the CROP intervention across the North East and North Cumbria.

There is some suggestion that there may be general direction of travel towards lower prescribing volumes in each of the CCGs included but overall significant findings are obscured by large differences between practices and a relatively insensitive measure.

As expected, opioid prescribing seems to be related at a practice level to the proportion of females and those with health conditions within the practice and strongly related to the deprivation of the practice as measured by the IMD.

These relationships are similar for gabapentinoid and duloxetine prescription. It appears that gabapentinoid prescribing is relatively stable and whilst duloxetine prescribing is increasing it has not been significantly accelerated by the CROP campaign.

There is a slight suggestion in some of the analyses that North Cumbria may be slightly different in some prescribing practices to the other CCGs in terms of direction of travel and total number of items prescribed and this could be a useful avenue to follow up. Similarly, the large increase in duloxetine prescribing in Northumberland associated with the CROP programme may be worth investigating.

There was strong support in the qualitative feedback that the CROP reports should be continued and would be useful – particularly with changes implemented such as conversion into equivalent dosage of morphine to allow better tracking of issues like dose reduction. Were such a scheme to be realised then the data generated in that way could be ideal for demonstrating effectiveness given that it would pick up far more subtle signals of success than the current crude measure of "items prescribed". In addition, given that there is evidence that high opioid prescription rates are significantly associated with areas of high deprivation then perhaps a more targeted approach to those areas would produce larger effects.

References

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