

MILLIMAN WHITE PAPER

How is the English NHS prescription drugs budget spent?

Second edition: FY 2018/19

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Executive summary

In May 2019, we presented an analysis on prescription drug costs and activity for NHS England¹ for financial year (FY) 2017/18 versus FY 2016/17. In this second edition report, we provide an updated view of NHSE prescription drug costs for FY 2018/19.

In FY2018/19, NHS England (NHSE) spent £7.99 billion on prescription drugs prescribed by general practitioners (GPs) to their patients. This level of expenditure has decreased by nearly 2.68% from FY 2017/18.

In Figure 1, we compare the trends for the three most recent financial year periods. Our analysis focuses on trends per person per month (PPPM) to standardise for population size changes between the comparison years. Overall, we observe a larger decrease in the prescription drug PPPM as compared to the previous year's trend. This is driven by a decrease in total prescription drug spending and offset by an increase in the population size.

FIGURE 1: OVERVIEW, FY 2016/17, FY 2017/18 AND FY 2018/19

Component	FY 2016/17	FY 2017/18	FY 2018/19	FY 2016/17 to FY 2017/18	FY 2017/18 to FY 2018/19
TOTAL FIGURES				TREND	TREND
Total cost (£ millions)	8,283.82	8,209.51	7,989.41	-0.90%	-2.68%
Total lives	57,880,736	58,672,414	59,370,620	1.37%	1.19%
Total cost PPPM (£)	11.93	11.66	11.21	-2.23%	-3.83%

In this version of the report, we have used population data from the NHS Digital website, whereas previously we used population data from the Office for National Statistics (ONS). The PPPM trend for FY 2016/17 to FY 2017/18 was reported as -1.7% in the previous report, while using the NHS Digital population data yields a PPPM trend of -2.2% over the same period. Further detail on this methodology change is included in the 'Underlying data and limitations' section of this report.

In this actuarial report, we investigate the drivers of the PPPM trend at a drug class and regional level using actuarial principles. The data and findings are interesting and certainly invite additional research into issues such as how different population risk profiles in different regions are expected to affect prescription drug costs, and how we can expect these costs to change over time, given expected changes in the population size and structure.

These insights can help stakeholders with experience analysis and planning by identifying cost and utilisation drivers on a population risk-adjusted basis as well as having a view of how demand may develop over the projection period.

WHAT IS DRIVING THE DOWNWARD TREND?

Similar to the previous report, the reduction in prescription drug expenditure is driven by a combination of lower average costs and lower levels of activity. The average cost per item has decreased by 3.83% while items per 1,000 lives has decreased by 0.92% from FY 2017/18 to 2018/19. Decreases in these components are slightly offset by the 1.19% increase in the English population size.

The majority of primary prescription drug spend in FY 2018/19—close to 60%—has gone to treating central nervous system, endocrine, cardiovascular and respiratory conditions. The PPPM costs for central nervous system, endocrine and respiratory conditions have decreased, largely driven by a reduction in the average cost per item. This is consistent with the trend observed for the previous year. The PPPM cost for cardiovascular conditions has increased by 2.7%, driven by a 3.2% increase in the average cost per item, with 'anticoagulants and protamine' being the main drug type driving the upward PPPM trend.

We have analysed cost and activity by Sustainability and Transformation Partnership (STP) areas to understand trends at a regional level and to reflect the regional level at which planning decisions are going to be made

¹ Buckle, J., Hayward, T., Aggarwal, A., & Chakravarty, L. (20 May 2019). How Is the English NHS Prescription Drugs Budget Spent? Milliman White Paper. Retrieved 1 October 2019 from http://assets.milliman.com/ektron/How_is_the_English_NHS_prescription_drugs_budget_spent_20190517.pdf?lng=2060.

moving forward. All the STPs have experienced PPPM decreases (ranging from 2.4% to 6.5%). In the previous report, all STPs experienced PPPM decreases or slight increases, except for Lancashire and South Cumbria STP, which had a PPPM increase of 7.7%. However, in the current year, all STPs have experienced PPPM decreases.

RISK PROFILE ADJUSTMENT AND PROJECTIONS

To enhance our trend analysis, we calculated risk-adjusted PPPMs for each STP to determine what PPPM we 'expect' based on each STP's risk profile compared to the English average. This insight allows us to identify STPs with lower-risk or higher-risk profiles compared to the average population and to identify STPs with lower or higher actual PPPM costs than expected based on the risk adjustment.

Lastly, using all of the above, we projected total and PPPM prescription drug costs over a five-year period under various trend scenarios to illustrate how changes in these trends and the population size and structure may change this area of NHS spend compared to the current experience.

Introduction

In the financial year (FY) 2017/18, the total healthcare budget for NHS England was £110 billion² and in FY 2018/19, the budget increased to £114 billion.³ NHS England receives the majority of the budget for health, approximately 88.1%, to deliver healthcare services across the population. In the 'Fair Shares – A Guide to NHS Allocations'⁴ for FY 2017/18,⁵ NHSE reports that it allocates approximately 68.0% of its budget to clinical commissioning groups (CCGs), and, of this, 11.6% is spent on medicines prescribed by GPs to their patients. This represents 7.9% of the total NHSE budget and 6.9% of the total Department of Health (DoH) budget.

Total primary care prescription drug costs for FY 2018/19 have decreased by nearly 2.68%, from £8.21 billion in FY 2017/18 to £7.99 billion in FY 2018/19.

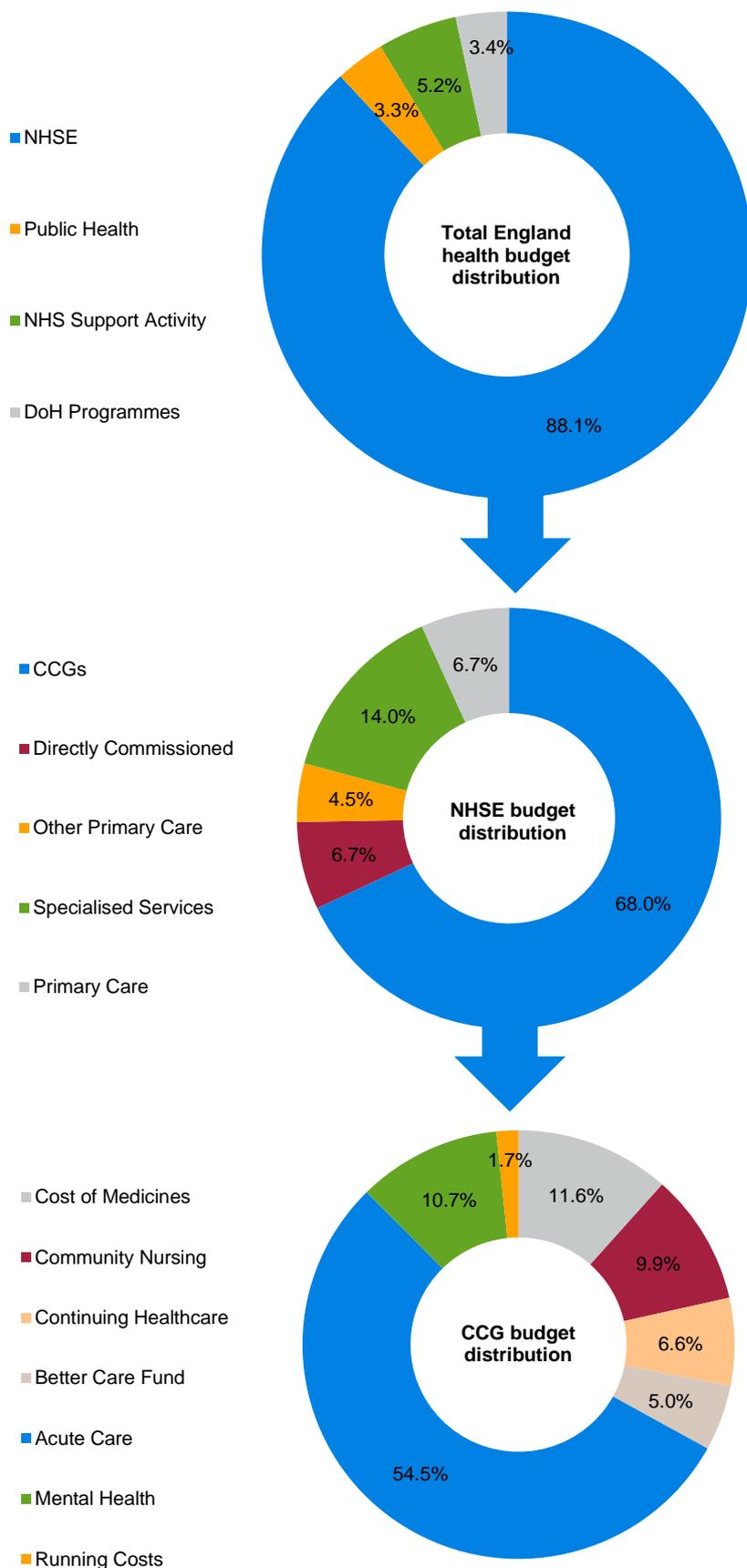
² NHS England. Our 2017/18 Annual Report. Retrieved 1 October 2019 from <https://www.england.nhs.uk/wp-content/uploads/2018/07/Annual-Report-Full-201718.pdf>.

³ NHS England. Our 2018/19 Report. Retrieved 1 October 2019 from <https://www.england.nhs.uk/wp-content/uploads/2019/07/Annual-Report-Full-201819.pdf>.

⁴ NHS England (September 2018). Fair Shares: A Guide to NHS Allocations. Retrieved 1 October 2019 from <https://www.england.nhs.uk/wp-content/uploads/2018/09/nhs-allocations-infographics-v1.2.pdf>.

⁵ At the time of writing, a similar publication has not been produced by NHSE for FY 2018/19.

FIGURE 2: BUDGET FOR HEALTHCARE IN ENGLAND, FY 2017/18



Glossary of terms

FIGURE 3: GLOSSARY OF TERMS

TERM	DESCRIPTION
BNF	British National Formulary, the standard list of medicine codes used by the NHS.
CCG	Clinical commissioning group.
FY	Financial year.
Items	A single supply of medicine, e.g., three items will be recorded for a prescription form with three medicine items.
NHS BSA	NHS Business Services Authority.
NHSE	National Health Service England.
NIC	Net ingredient cost. This is the list price excluding the value-added tax (VAT) that can be found in the National Drug Tariff.
PCO	Primary care organisation.
PPPM	Per person per month cost.
RA	Risk-adjusted.
STP	Sustainability and Transformation Partnership.
Total cost	Represents the true price paid by the NHS. Total cost = NIC – (discounts) + (payment for consumables, container and out-of-pocket expenses)

Underlying data and limitations

Data has been extracted from the publicly available prescription drugs data⁶ published by the NHS Business Services Authority (BSA) for FY 2017/18 and FY 2018/19. This data includes the number of prescription items and associated costs that are prescribed and dispensed for each GP practice in England on a monthly basis by British National Formulary (BNF) code for drugs. The data excludes high-cost drugs, drugs dispensed in a hospital setting, drugs prescribed in hospital and dispensed in the community, private prescriptions, over-the-counter (OTC) drugs and dispensing costs. For the purposes of our analysis, we have only included data where the primary care organisation (PCO) name within the data relates to a CCG. Excluded PCOs⁷ account for 0.7% of total cost and 1.0% of total activity in FY 2018/19.

Population risk-adjustment factors used in our analysis have been calibrated using the prescribing needs factors⁸ published by NHSE. The prescribing needs factors are used by NHSE to allocate financial resources to CCGs based on local healthcare needs.

Population figures by CCG have been extracted from the NHS Digital website.⁹ The projected population figures have been extracted from the allocations section of the NHS website.¹⁰ Note that the previous version of this paper,¹¹ which reported on FY 2016/17 and FY 2017/18, used projections from the Office for National Statistics (ONS) data set 'Population projections for clinical commissioning groups and NHS regions.'¹² The NHS population figures give a more accurate and relevant reflection of current population levels. The NHS population figures report on monthly GP registered lives, whereas the ONS provides a yearly number of projected patients based on historical registrations. The ONS data is based on the mid-2016 population of England, whereas the NHS data is based on the mid-2018 population. Figure 4 summarises the differences in the lives and PPPM figures in our earlier report and this updated version. Note that in both versions of the report we see the same directional trend for FY 2016/17 to FY 2017/18 even though the magnitude is slightly different.

⁶ NHS BSA. Prescription Data. Retrieved 17 May 2019 from <https://www.nhsbsa.nhs.uk/prescription-data>.

⁷ Excluded PCOs include organisations such as community hospitals and clinics, rehabilitation and dental centres and nursing services.

⁸ NHSE. Allocations. Retrieved 17 May 2019 from <https://www.england.nhs.uk/allocations/>.

⁹ NHS Digital. Patients Registered at a GP Practice (month-wise registration at GP practices). Retrieved 1 October 2019 from <https://digital.nhs.uk/data-and-information/publications/statistical/patients-registered-at-a-gp-practice>.

¹⁰ NHS England. Allocations (population projections). Retrieved 1 October 2019 from <https://www.england.nhs.uk/allocations/>.

¹¹ Buckle, J. et al., op cit.

¹² ONS. Data set: Population Projections for Clinical Commissioning Groups and NHS regions: Table 3. Retrieved 17 May 2019 from <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections>.

FIGURE 4: ONS VS. NHS POPULATION FIGURES

	First version of report (using ONS population figures)		Current version of report (using NHS population figures)		Percentage difference (current vs. first version)	
	FY 2016/17	FY 2017/18	FY 2016/17	FY 2017/18	FY 2016/17	FY 2017/18
Total lives	55,324,130	55,745,676	57,880,736	58,672,414	4.6%	5.3%
Total cost PPPM (£)	12.48	12.27	11.93	11.66	- 4.4%	- 5.0%

In carrying out our analysis and producing this paper, we relied on the data and information obtained from the sources described above. We have not audited or verified this data or other information. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete. We performed a limited review of the data used directly in our analysis for reasonability and consistency, and we have not found any material defects in the data. This paper is intended solely for education purposes and presents information of a general nature.

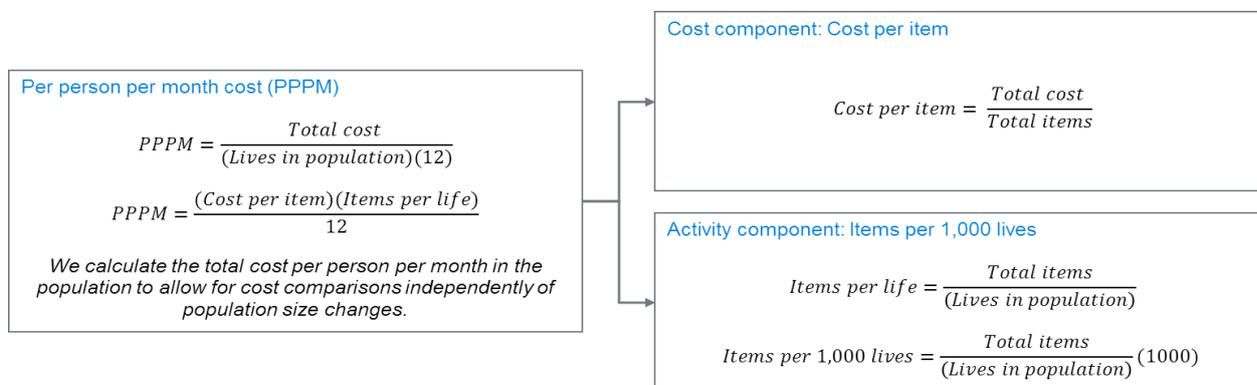
The underlying data and analysis have been reviewed on this basis. This paper is not intended to guide or determine any specific individual situation and readers should consult qualified professionals before taking specific actions.

Differences between our projections and actual amounts depend on the extent to which future experience conforms to the assumptions made for this analysis. It is certain that actual experience will not conform exactly to the assumptions used in this analysis. Actual amounts will differ from projected amounts to the extent that actual experience deviates from expected experience.

Cost and activity overview

To understand how total prescription drug cost has changed from one financial year to the next, we use a PPPM measure and decompose it into cost per item and items per 1,000 lives to identify trend drivers, as shown in Figure 5.

FIGURE 5: DECOMPOSITION OF PPPM INTO COST AND ACTIVITY COMPONENTS



The total spend on prescription drugs decreased by almost 2.7% from FY 2017/18 to FY 2018/19. This is driven by a 3.83% decrease in PPPM costs and offset by an increase of 1.19% in the total entitled population. The total cost PPPM trend is driven mainly by the total cost per item trend of -2.93% and a smaller component of the trend is driven by the items per 1,000 lives trend of -0.92%.

FIGURE 6: OVERVIEW OF COST AND ACTIVITY, FY 2016/17, FY 2017/18 AND FY 2018/19

Cost/activity component	FY 2016/17	FY 2017/18	FY 2018/19	FY 2016/17 to FY 2017/18	FY 2017/18 to FY 2018/19
TOTAL FIGURES				TREND	TREND
Total cost (£ millions)	8,283.82	8,209.51	7,989.41	-0.90%	-2.68%
Total lives	57,880,736	58,672,414	59,370,620	1.37%	1.19%
Total cost PPPM (£)	11.93	11.66	11.21	-2.23%	-3.83%
NIC cost PPPM (£)	12.81	12.53	12.02	-2.24%	-4.04%
COST					
Total cost per item (£)	7.58	7.52	7.30	-0.80%	-2.93%
NIC cost per item (£)	8.14	8.08	7.82	-0.80%	-3.14%
ACTIVITY					
Items per 1,000 lives	18,887	18,614	18,442	-1.45%	-0.92%

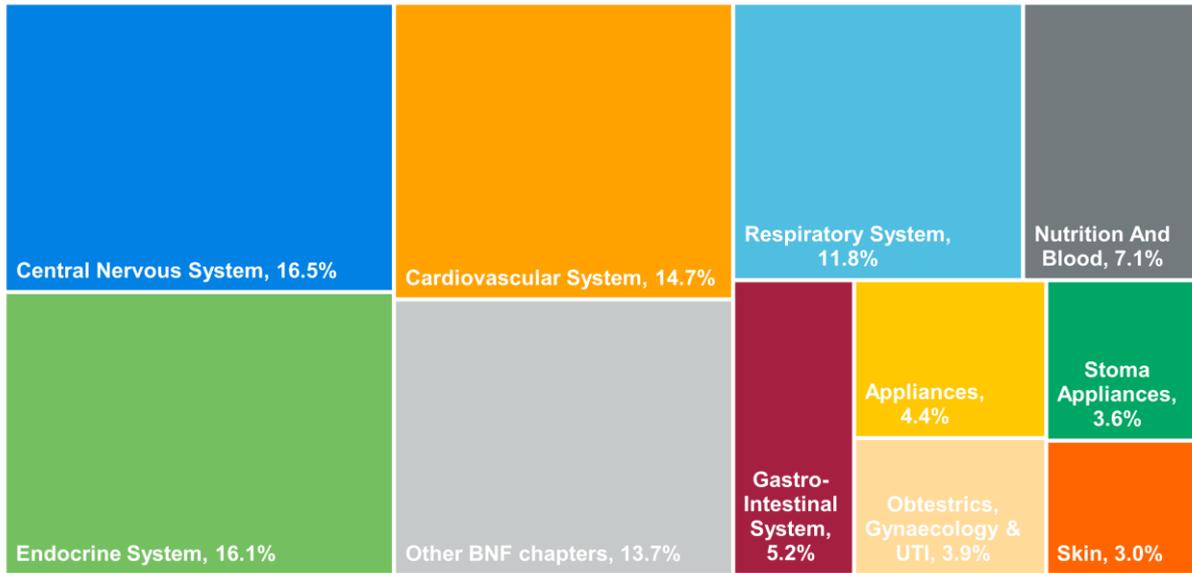
BNF chapters driving trend

Close to 60% of the total cost in FY 2018/19 is attributed to the Central Nervous System, Endocrine, Cardiovascular and Respiratory British National Formulary (BNF) chapters. Within these four major chapters, over 75% of costs are due to the types of drugs shown in Figure 7.

FIGURE 7: MAJOR BNF SECTIONS WITHIN TOP FOUR BNF CHAPTERS BY TOTAL COST, FY 2018/19

BNF CHAPTER AND SECTION	PROPORTION OF TOTAL COST WITHIN CHAPTER
CENTRAL NERVOUS SYSTEM	
Analgesics	29.32%
Antiepileptic Drugs	23.76%
Antidepressant Drugs	13.84%
Drugs Used In Psychoses and Related Disorders	10.04%
Total within BNF Chapter	76.96%
ENDOCRINE	
Drugs Used In Diabetes	77.43%
Thyroid and Antithyroid Drugs	7.80%
Total within BNF Chapter	85.23%
CARDIOVASCULAR	
Anticoagulants and Protamine	42.58%
Nit, Calc Block and Other Antianginal Drugs	14.20%
Hypertension and Heart Failure	15.67%
Lipid-Regulating Drugs	11.12%
Total within BNF Chapter	83.57%
RESPIRATORY	
Corticosteroids (Respiratory)	59.83%
Bronchodilators	32.00%
Total within BNF Chapter	91.83%

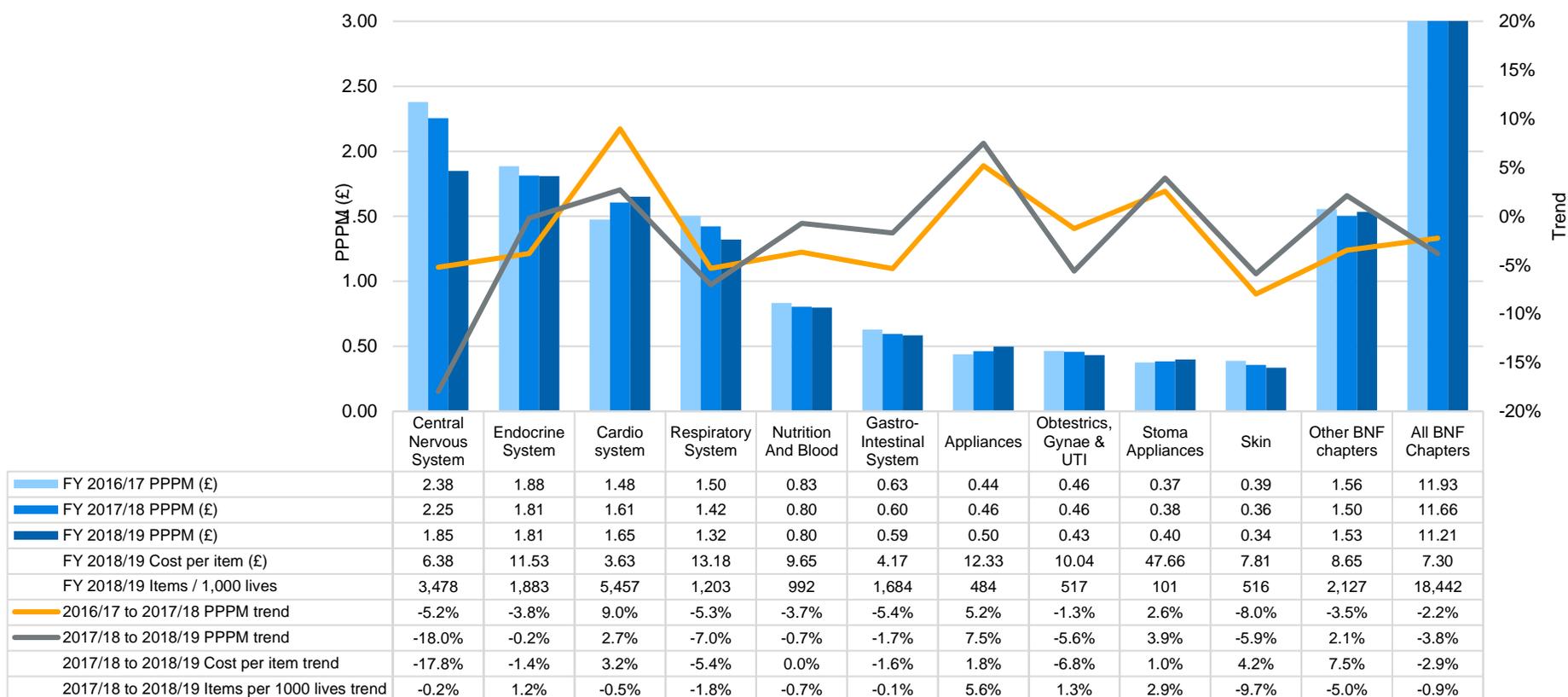
FIGURE 8: DISTRIBUTION OF TOTAL COST BY BNF CHAPTER, FY 2018/19



Cardiovascular system drugs have experienced a 2.7% PPPM increase, driven by a 3.2% increase in cost per item. 'Anticoagulants and protamine' is the main BNF section driving the cardiovascular PPPM trend, with an increase of 24.5%.

All other BNF chapters (amongst the top 10 chapters) have experienced PPPM decreases (apart from Appliances and Stoma Appliances), driven by a combination of decreases in cost per item and items per 1,000 lives.

FIGURE 9: COMPONENTS OF TOTAL PPPM TREND BY BNF CHAPTER; FY 2016/17 VS. FY 2017/18 VS. FY 2018/19



STPs driving trend

SUSTAINABILITY AND TRANSFORMATION PARTNERSHIPS (STPs)

Sustainability and Transformation Partnerships (STPs) have been established as part of the NHS's five-year forward view. Local NHS organisations and councils have drawn up shared proposals to improve health and care in the areas they serve, with the long-term needs of local communities in mind. Each STP comprises an assembly of CCGs, local councils and providers.

In order to understand the distribution of cost and activity and associated trends for prescription drugs at a regional level, we have grouped the experience by CCG into the respective STPs. STP boundaries are shown in Figure 10.

FIGURE 10: STP BOUNDARIES AND LABELS, FY 2018/19



NO.	STP	NO.	STP	NO.	STP
1	Cumbria and North East	15	Birmingham and Solihull	29	Frimley Health
2	Lancashire and South Cumbria	16	Coventry and Warwickshire	30	Surrey Heartlands
3	West Yorkshire	17	Northamptonshire	31	North West London
4	Humber, Coast and Vale	18	Cambridgeshire and Peterborough	32	North Central London
5	Greater Manchester	19	Norfolk and Waveney	33	South West London
6	South Yorkshire and Bassetlaw	20	Herefordshire and Worcestershire	34	South East London
7	Cheshire and Merseyside	21	Gloucestershire	35	North East London
8	Derbyshire	22	Buckinghamshire, Oxfordshire and Berkshire West	36	Mid and South Essex
9	Nottinghamshire	23	Milton Keynes, Bedfordshire and Luton	37	Cornwall and the Isles of Scilly
10	Lincolnshire	24	Hertfordshire and West Essex	38	Devon
11	Staffordshire	25	Suffolk and North East Essex	39	Somerset
12	Leicester, Leicestershire and Rutland	26	Bristol, North Somerset and South Gloucestershire	40	Dorset
13	Shropshire and Telford and Wrekin	27	Bath, Swindon and Wiltshire	41	Sussex and East Surrey
14	The Black Country	28	Hampshire and the Isle of Wight	42	Kent and Medway

TREND DRIVERS

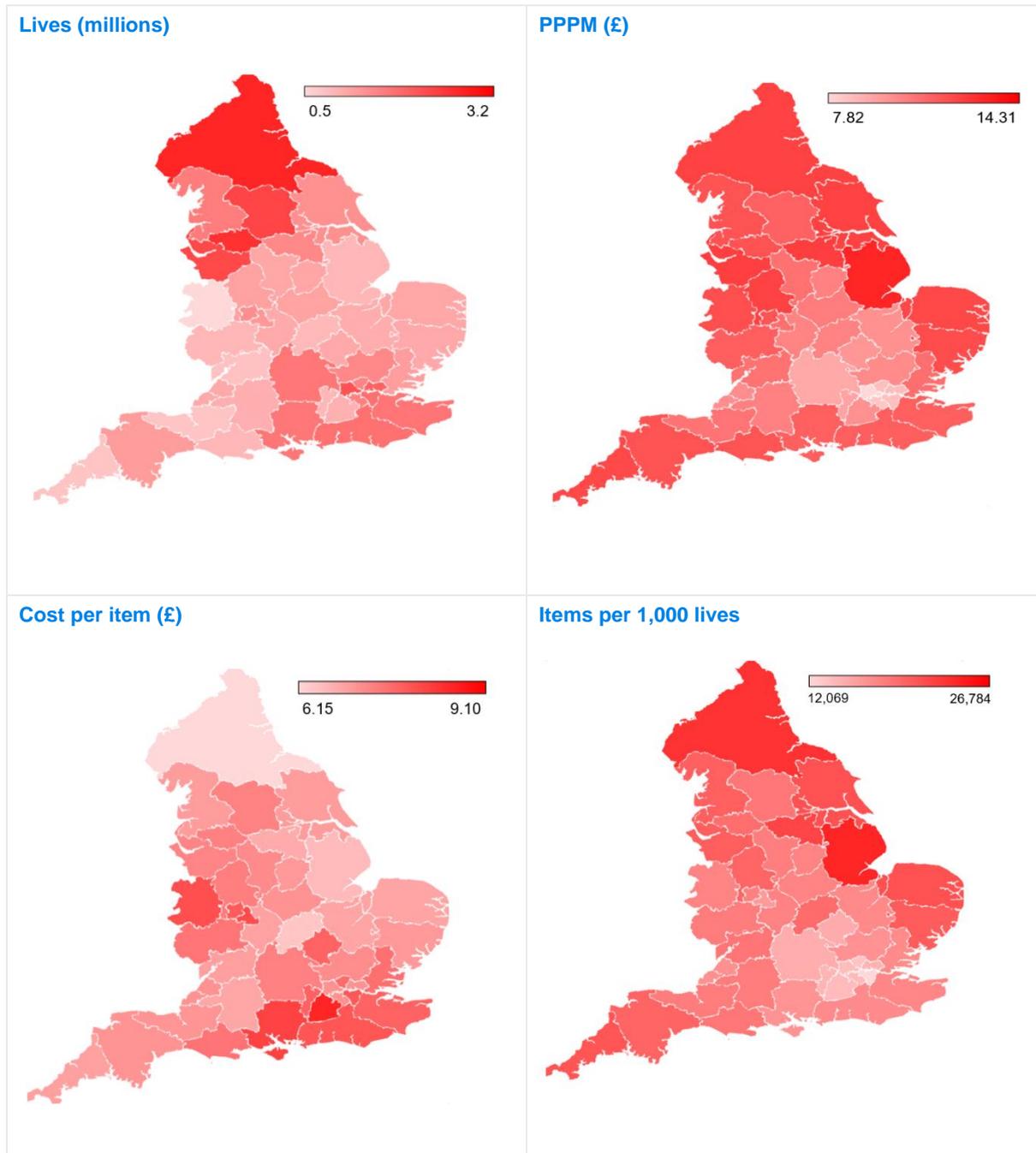
Figure 11 shows the drivers of PPPM trend for the top 20 STPs by total cost in FY 2018/19. Of the top 20 STPs, Cumbria and North East STP has the highest total cost in FY 2018/19. All the STPs have experienced a decrease in the PPPM, which is mainly driven by the decrease in cost per item. Similarly, the cost per item has a negative trend for all STPs for the two comparison years. There is a marginal increase in the items per 1,000 lives for two STPs: Cumbria and North East plus Humber, Coast and Vale. For the remaining STPs there is a decrease in the items per 1,000 lives.

The heat maps in Figure 12 help us to visually identify if high/low PPPM STPs have high/low costs per item and/or items per 1,000 lives.

FIGURE 11: COMPONENTS OF PPPM TREND BY STP FY 2017/18 VS. FY 2018/19

STP No.	STP	FY 2018/19 Lives (millions)	PPPM (£)			Cost per item (£)			Items per 1,000 lives		
			FY 2017/18	FY 2018/19	Trend	FY 2017/18	FY 2018/19	Trend	FY 2017/18	FY 2018/19	Trend
1	Cumbria and North East	3.24	13.71	13.16	-4.0%	6.44	6.15	-4.5%	25,545	25,657	0.4%
5	Greater Manchester	3.06	13.04	12.47	-4.4%	7.68	7.43	-3.3%	20,361	20,144	-1.1%
7	Cheshire and Merseyside	2.64	13.73	13.27	-3.4%	7.59	7.36	-3.0%	21,714	21,632	-0.4%
3	West Yorkshire	2.72	12.44	11.92	-4.2%	7.66	7.41	-3.3%	19,497	19,308	-1.0%
41	Sussex and East Surrey	1.95	12.65	12.05	-4.8%	8.53	8.23	-3.4%	17,799	17,557	-1.4%
42	Kent and Medway	1.90	12.53	11.98	-4.4%	8.25	7.97	-3.4%	18,226	18,035	-1.0%
2	Hampshire and the Isle of Wight	1.88	12.31	12.00	-2.5%	8.76	8.57	-2.2%	16,853	16,794	-0.4%
28	Lancashire and South Cumbria	1.77	13.12	12.49	-4.8%	7.18	6.95	-3.2%	21,932	21,557	-1.7%
6	South Yorkshire and Bassetlaw	1.57	13.81	13.30	-3.7%	6.90	6.67	-3.3%	24,015	23,915	-0.4%
31	North West London	2.47	8.29	7.82	-5.7%	7.31	7.15	-2.2%	13,607	13,125	-3.5%
4	Humber, Coast and Vale	1.43	13.52	13.20	-2.4%	7.13	6.94	-2.6%	22,754	22,819	0.3%
35	North East London	2.20	8.80	8.36	-5.0%	7.39	7.14	-3.4%	14,284	14,045	-1.7%
14	The Black Country	1.46	12.93	12.43	-3.9%	8.29	8.10	-2.2%	18,722	18,402	-1.7%
22	Buckinghamshire, Oxfordshire and Berkshire West	1.86	9.40	9.08	-3.3%	7.64	7.45	-2.4%	14,762	14,623	-0.9%
34	South East London	1.97	8.77	8.20	-6.5%	8.46	8.15	-3.6%	12,442	12,069	-3.0%
24	Hertfordshire and West Essex	1.56	10.71	10.26	-4.1%	7.49	7.24	-3.4%	17,149	17,015	-0.8%
38	Devon	1.23	12.77	12.47	-2.4%	7.27	7.11	-2.2%	21,087	21,049	-0.2%
11	Staffordshire	1.15	13.50	13.14	-2.7%	7.66	7.51	-2.1%	21,137	21,009	-0.6%
15	Birmingham and Solihull	1.32	11.74	11.32	-3.6%	8.54	8.39	-1.7%	16,505	16,188	-1.9%
36	Mid and South Essex	1.22	11.84	11.40	-3.7%	8.00	7.75	-3.1%	17,759	17,658	-0.6%
	Others	20.76	11.09	10.72	-3.3%	7.38	7.19	-2.6%	18,016	17,883	-0.7%
	Total	59.37	11.66	11.21	-3.8%	7.52	7.30	-2.9%	18,614	18,442	-0.9%

FIGURE 12: COMPONENTS OF PPPM TREND BY STP, FY 2018/19



Risk adjustment

Each CCG (and by extension each STP) has a different population size and risk profile and consequently a different cost and activity profile for prescription drugs. We standardise for differences in population size by reporting cost and activity at PPPM, cost per item and items per 1,000 lives levels. To standardise for differences in risk profile, we use the prescribing factors that have been developed by NHSE.

NHSE PRESCRIBING FACTORS

The allocation of financial resources from NHSE to each CCG is determined using a statistical formula.¹³ The formula takes into account various demand and supply factors. The aim is to make the geographical distribution of funds fair and objective while reflecting local healthcare needs and reducing inequalities.

The funding allocation formula for CCGs considers prescribing, mental health and maternity services separately from other healthcare services. As such, we have used the prescribing factors as part of our risk adjustment methodology. The prescribing factors incorporate adjustments for the following:

1. Distribution of registered patients by age band and sex
2. Other factors:
 - Proportion of registered patients aged over 85
 - Proportion of registered patients aged over 70 and claiming Disability Living Allowance
 - Standardised mortality ratio for all ages
 - Fertility rate
 - Practices with the largest proportions of registered patients aged 20 to 24
 - Index of Multiple Deprivation (IMD) overall score¹⁴
 - Proportion of registered patients with activity-limiting health conditions, age/sex-standardised
 - Proportion of registered patients in social housing
 - Ethnicity, age/sex-standardised

In order to use these factors in our modelling, we have considered them in two major categories: 'age/sex' and 'other' factors. We have normalised the factors based on the population size and age/sex distribution of the population for each CCG for each financial year included in the analysis. For each CCG, we expect the 'age/sex' factor to change from one year to the next as the mix in lives changes. For the 'other' factors, there is no published change at a CCG level from one year to the next. At an STP level, there is a change in both groups of factors based on how the mix in lives changes within the CCGs that are allocated to each STP.

RISK-ADJUSTED PRESCRIBING PPPMS

After calculating the total prescribing 'age/sex' and 'other' factors, we calculate a risk-adjusted PPPM cost for each STP. The risk adjustment factor for each STP represents how different we expect the PPPM for a particular STP to be, compared to the average PPPM across all STPs, given the risk profile of registered patients within the STP. Consequently, the risk-adjusted PPPM is the PPPM we *expect* based on the average across the country and the STP's risk profile.

For example, for an STP with a risk adjustment factor of 1.03 relative to the average, we expect a PPPM 3% higher than the average PPPM, i.e., if the average PPPM is £100, the risk-adjusted PPPM is £103. If the STP has an actual PPPM of £105, the actual versus risk-adjusted value is 1.02 (£105/£103). The STP has a PPPM that is 5.0% higher than the average PPPM but, after adjusting for the STP's risk profile, we see that the difference between the STP's risk-adjusted PPPM and the average PPPM is 2.0%.

By comparing the actual and risk-adjusted PPPMs, we are able to:

- Identify STPs with lower-risk and higher-risk profiles compared to the average population
- Identify STPs with lower and higher actual PPPM costs than expected based on their risk-adjusted PPPMs

¹³ Additional detail on the funding allocation formula can be found here: <https://www.england.nhs.uk/wp-content/uploads/2016/04/1-allctins-16-17-tech-guid-formulae-v1.pdf>.

¹⁴ The indices of deprivation measure relative levels of deprivation in small areas and neighbourhoods in England.

The total risk adjustment factors by STP have negligible changes between FY 2017/18 and FY 2018/19. Consequently, differences in risk-adjusted PPPM costs and risk-adjusted versus actual PPPM costs are due to changes in experience for reasons other than changes in risk profile.

Column B in the table in Figure 13 denotes the relative risk profile of an STP relative to the average across all STPs. For example, the risk profile of Devon is significantly higher than average. Column D in Figure 13 denotes the relative difference between actual and risk-adjusted PPPM. For example, South Yorkshire and Bassetlaw and The Black Country have higher PPPMs than we would 'expect' given their risk profiles.

FIGURE 13: RISK-ADJUSTED PPPM COSTS BY STP, FY 2018/19

STP NO.	STP	Actual PPPM (£) (A)	Risk adjustment factor relative to average (B)	Risk adjusted PPPM (£) (C) = (A _{Total})*(B)	Actual vs. risk adjusted PPPM (D) = (A)/(C)
1	Cumbria and North East	13.16	1.06	11.88	1.11
5	Greater Manchester	12.47	0.98	11.02	1.13
7	Cheshire and Merseyside	13.27	1.05	11.81	1.12
3	West Yorkshire	11.92	0.98	11.04	1.08
41	Sussex and East Surrey	12.05	1.05	11.79	1.02
42	Kent and Medway	11.98	1.02	11.47	1.04
2	Hampshire and the Isle of Wight	12.00	1.07	11.97	1.00
28	Lancashire and South Cumbria	12.49	1.09	12.28	1.02
6	South Yorkshire and Bassetlaw	13.30	0.94	10.49	1.27
31	North West London	7.82	0.85	9.51	0.82
4	Humber, Coast and Vale	13.20	1.09	12.26	1.08
35	North East London	8.36	0.82	9.17	0.91
14	The Black Country	12.43	0.95	10.68	1.16
22	Buckinghamshire, Oxfordshire and Berkshire West	9.08	0.90	10.07	0.90
34	South East London	8.20	0.81	9.13	0.90
24	Hertfordshire and West Essex	10.26	1.11	12.40	0.83
38	Devon	12.47	1.24	13.87	0.90
11	Staffordshire	13.14	1.16	13.00	1.01
15	Birmingham and Solihull	11.32	1.03	11.59	0.98
36	Mid and South Essex	11.40	1.02	11.41	1.00
	Other STPs	10.72	1.00	11.21	0.96
	Total	11.21	1.00	11.21	1.00

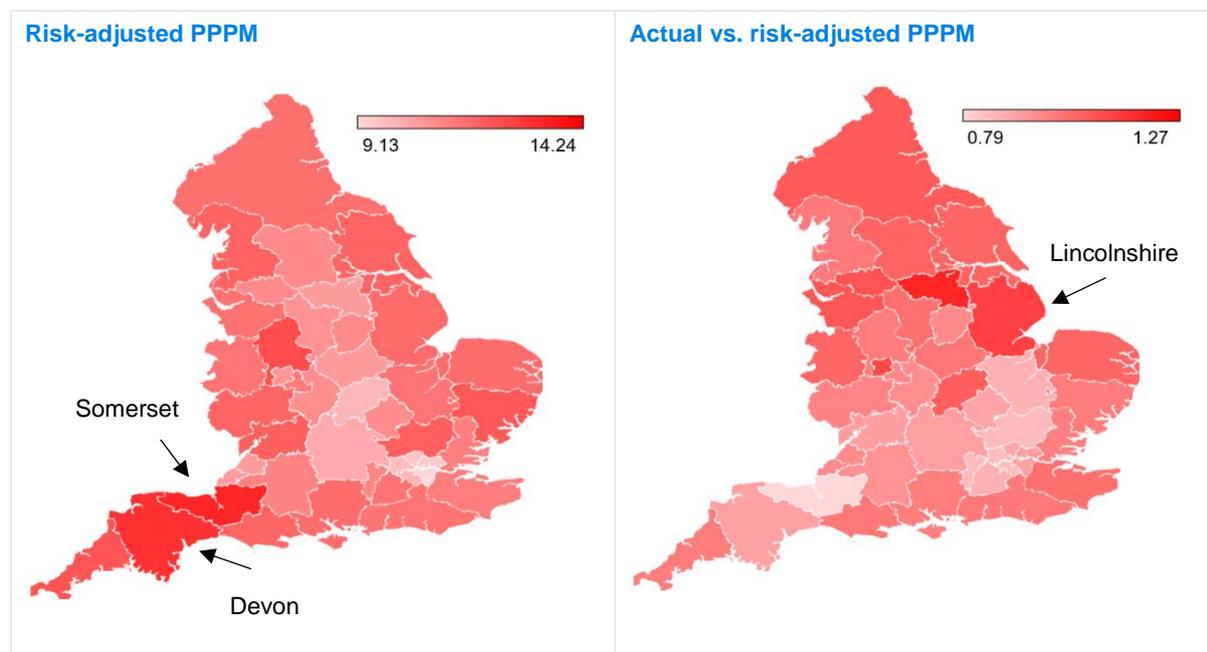
Differences between risk-adjusted PPPMs and actual and risk-adjusted PPPM costs are highlighted in the heat maps in Figure 14. The risk-adjusted PPPM map shows how risk profiles vary by STP, with darker areas having higher-risk profiles. The actual versus risk-adjusted PPPM map shows how different STPs are spending less money (lighter areas) or more money (darker areas) than their risk profiles would suggest. STPs in the north, southwest and east of the country appear to have higher-risk profiles and, consequently, higher risk-adjusted PPPMs than central regions.

Larger differences between actual and risk-adjusted PPPMs are observed in the north of the country as well as in the southeast.

The two southwest STPs of Devon and Somerset have a high risk-adjusted PPPM, indicating that the two STPs have higher-risk profiles than an average STP.

Lincolnshire has the highest actual PPPM of all STPs in FY 2018/19 and also a large difference between the actual and risk-adjusted PPPMs, i.e., after standardising for the higher-risk profile in Lincolnshire, it still has a higher average PPPM than other STPs. The differences between actual and risk-adjusted PPPMs may indicate that the funding allocation formula is not accurately capturing the risk profiles within the CCGs or STPs, which may signal that the factors used could benefit from being updated to reflect current risk profiles.

FIGURE 14: RISK-ADJUSTED PPPM AND ACTUAL VS. RISK-ADJUSTED PPPM BY STP, FY 2018/19



Projections

So far, we have focused on historical data for two financial years, but it is also possible to project how we may expect prescription drug total cost PPPMs and total costs to change over the next five years. These projections are based on how we expect the population size and structure to change, along with various scenarios for PPPM cost trends.

In order to determine how the population size and structure may change over the projection period, we have used NHS England allocations population projections by age-band, sex and CCG.

We have defined various PPPM trend scenarios to give an idea of how prescription drug PPPMs and total costs may develop over the projection period. The historical trend has been calculated as the PPPM trend from FY 2017/18 and FY 2018/19, after removing the effects of age/sex and other prescribing factors. This is approximately equal to -4.0% per year.

All scenarios include demographic trends which adjust the total costs and PPPM projections for the projected effects of age/sex and other prescribing factors, as well as projected changes in the population size.

FIGURE 15: DESCRIPTION OF PROJECTION SCENARIOS

Scenario	Trends used
Historical	PPPM trend of -4.0% for all projection years
Medium	PPPM trend of -2.0% for all projection years
Zero	PPPM trend of 0.0% for all projection years
High	PPPM trend of 2.0% for all projection years

Because the historical PPPM trend from FY 2017/18 to FY 2018/19 is negative, total and PPPM costs under the 'historical' and 'medium' scenarios are projected to decrease. The negative historical trend is driven by the reduction in total cost from FY 2017/18 to FY 2018/19. Actual future trends will depend on changes to the overall health budget and funding allocation decisions made by NHSE.

The 'zero' trend scenario shows the expected effect of changes in age/sex and other factors without any assumed cost or activity per person trend. The 'high' trend scenario illustrates how total cost and PPPM costs may change if PPPM costs increase by 2.0% per year.

Unlike the PPPM projection, the total cost projection reflects expected changes in the population size. We observe that the annual average trend for the total prescribing costs for the 'zero' trend scenario is 0.5%, which reflects the impact of demographic changes in the projection period.

FIGURE 16: PROJECTED PPPM PRESCRIBING COSTS (USING ACTUAL FY 2018/19 FIGURES)

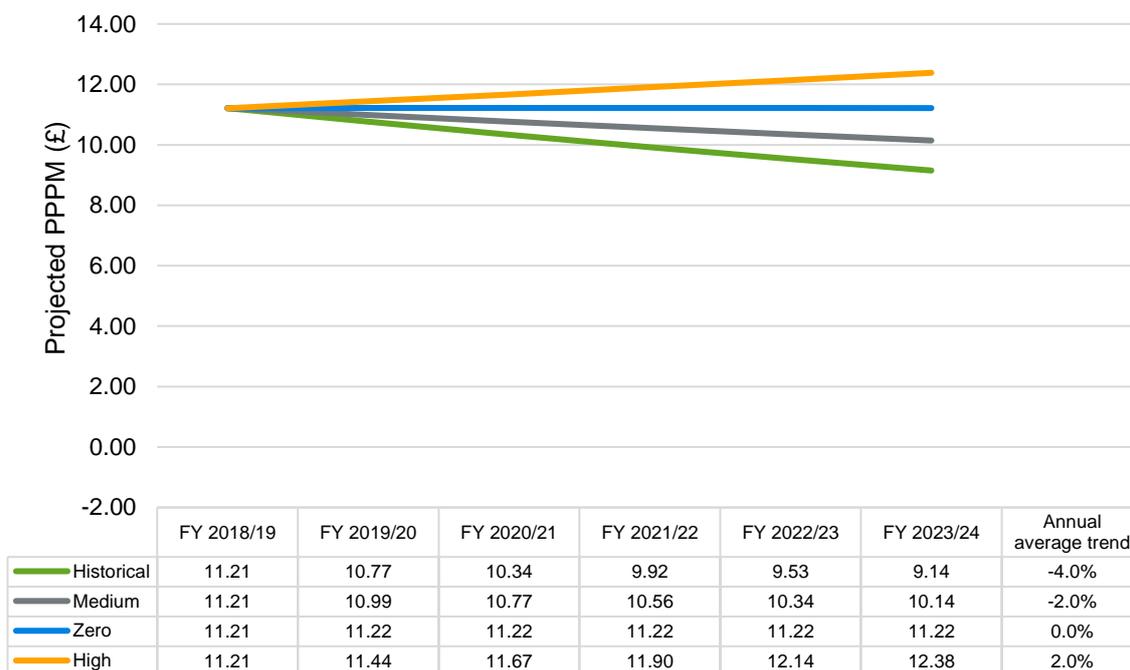
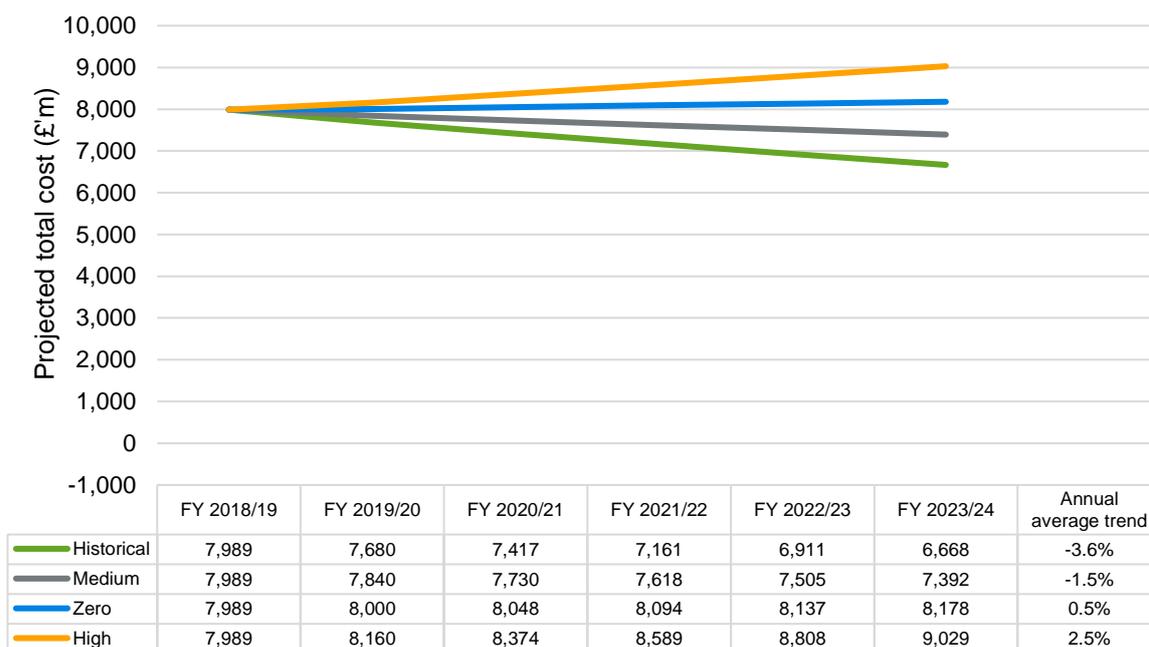


FIGURE 17: PROJECTED TOTAL PRESCRIBING COSTS (USING ACTUAL FY 2018/19 FIGURES)



Applying the historical trend scenario by STP, we are able to calculate the projected PPPM for each projection year. The projected PPPMs observed in Figure 18 are driven by a combination of the demographic factor changes and the PPPM trend that has been applied.

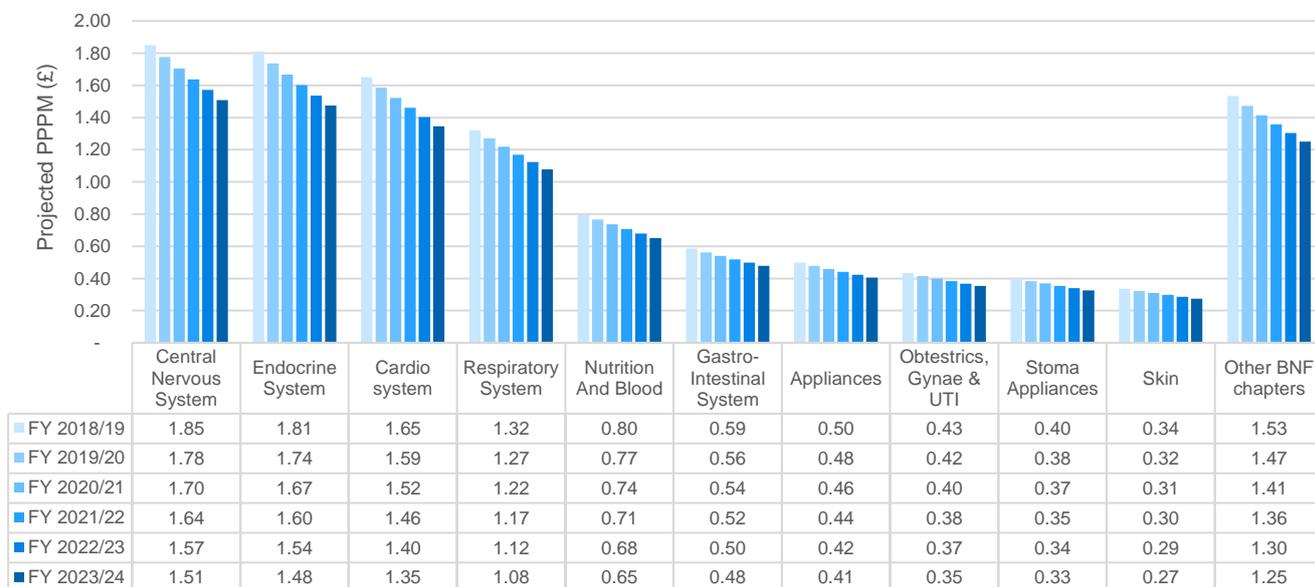
FIGURE 18: PROJECTED PPPM PRESCRIBING COSTS FOR TOP 20 STPS (USING ACTUAL FY 2018/19 FIGURES)

		PPPM (£)					
STP No.	STP	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24
1	Cumbria and North East	13.16	12.63	12.13	11.64	11.18	10.73
5	Greater Manchester	12.47	11.97	11.49	11.02	10.58	10.16
7	Cheshire and Merseyside	13.27	12.74	12.23	11.74	11.27	10.82
3	West Yorkshire	11.92	11.44	10.99	10.55	10.13	9.72
41	Sussex and East Surrey	12.05	11.57	11.11	10.67	10.24	9.83
42	Kent and Medway	11.98	11.50	11.04	10.60	10.17	9.77
2	Hampshire and the Isle of Wight	12.00	11.52	11.06	10.62	10.19	9.79
28	Lancashire and South Cumbria	12.49	11.99	11.51	11.05	10.61	10.18
6	South Yorkshire and Bassetlaw	13.30	12.77	12.26	11.77	11.30	10.84
31	North West London	7.82	7.51	7.21	6.93	6.65	6.38
4	Humber, Coast and Vale	13.20	12.67	12.16	11.68	11.21	10.76
35	North East London	8.36	8.03	7.70	7.40	7.10	6.82
14	The Black Country	12.43	11.93	11.45	10.99	10.55	10.13
22	Buckinghamshire, Oxfordshire and Berkshire West	9.08	8.72	8.37	8.04	7.72	7.41
34	South East London	8.20	7.87	7.56	7.26	6.97	6.69
24	Hertfordshire and West Essex	10.26	9.85	9.46	9.08	8.72	8.37
38	Devon	12.47	11.97	11.49	11.03	10.59	10.17
11	Staffordshire	13.14	12.62	12.11	11.63	11.16	10.72

		PPPM (£)					
STP No.	STP	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24
15	Birmingham and Solihull	11.32	10.87	10.44	10.02	9.62	9.23
36	Mid and South Essex	11.40	10.95	10.51	10.09	9.68	9.30
	Other STPs	10.72	10.29	9.89	9.50	9.12	8.76
	Total	11.21	10.77	10.34	9.92	9.53	9.14
Total lives (millions)		59.4	59.4	59.8	60.1	60.5	60.8
Total cost (£ millions)		7,989.4	7,680.4	7,417.4	7,160.8	6,911.2	6,668.3

Figure 19 illustrates projected PPPM costs over the projection period using the historical trend scenario. With the data available, it is not possible to isolate the impact of changing age/sex and other factors at a BNF chapter level and, as such, the same historical trend and age/sex and other factors have been applied across all BNF chapters.

FIGURE 19: PROJECTED PPPM PRESCRIBING COSTS FOR TOP 10 BNF CHAPTERS (USING ACTUAL FY 2018/19 FIGURES)



Conclusion

In this paper, we provide a snapshot of the GP prescription cost and activity as well as driving trends for FY 2017/18 and FY 2018/19 in England. In addition to the actual position, we also discuss the cost and activity in FY 2018/19 if they are risk-adjusted for demographic factors. Finally, we provide a five-year projection of prescription cost (on total and PPPM bases).

We observe that the population size of NHS England has increased by 1.19% (58.7 million to 59.4 million) and the total cost PPPM has decreased by 3.83% (£11.66 to £11.21) from FY 2017/18 to FY 2018/19. Hence, the net effect is the decrease of total cost of almost 2.7% from FY 2017/18 to FY 2018/19. The decrease in total cost PPPM is driven mainly by the decrease in total cost per item trend.

Of the 21 BNF chapters, the following four comprise close to 60% of total cost: Central Nervous, Endocrine, Cardiovascular and Respiratory. We observe that the total PPPM cost decreases for most of the top 10 BNF chapters (by cost for FY 2018/19), except for Cardiovascular, Appliances and Stoma Appliances, which experienced PPPM increases.

We have compared the demographic distribution, prescription cost per item and activity levels of England's STPs for FY 2018/19. From this analysis, we observe that areas of high concentration for each parameter lie in different STPs. For FY 2018/19, Cumbria and North East STP has the highest number of lives, the highest cost per item is for Surrey Heartlands and the highest activity level per 1,000 lives is in Lincolnshire (as illustrated in the relevant heat maps in Figure 14). We have observed that there are no significant differences in the relative STP distribution of cost and activity levels between FY 2017/18 and FY 2018/19. Hence, the mix of cost by STP has remained steady over the two financial years.

We risk-adjusted the FY 2018/19 prescription cost of each STP (using demographic variables of age, gender and other factors) to obtain a more comparable view of cost by STPs. Overall, after risk adjustment, we observe a more consistent spread of total PPPM costs across England. Broadly, in FY 2018/19 the STPs in the north, east and southwest of England seem to have higher risk-adjusted total cost PPPMs as compared to the central and southern regions.

We also provide a five-year projection based on the total cost PPPM of FY 2018/19 and the population size projections. We use various scenarios to understand the impact of demographic and cost trends on the total cost. In the case of 'historical' and 'medium' total cost PPPM trend scenarios, we observe that total costs decrease by approximately 3.6% and 1.5% per year, respectively. For the 'zero' trend total cost PPPM scenario, we observe the pure impact of the age/sex and other factors, which is about 0.5% per year on the total cost. In the 'high' total cost PPPM trend scenario, the total cost increases by approximately 2.5% per year.

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