NHS Antidepressant Prescribing Analysis: Trends in Volume, Cost, and Regional Dynamics (2021-2025)

1. Executive Summary

This project presents a comprehensive analysis of antidepressant prescription trends within the National Health Service (NHS) in England from January 2021 to April 2025. The core objective was to investigate the dynamics of prescription volume (items) and associated costs at national, regional, and specific drug levels.

The analysis reveals a significant divergence: while the total number of antidepressant items prescribed consistently increased across all NHS regions, total national prescribing costs experienced a dramatic reduction between 2021 and 2024. This cost reduction and containment was likely driven by the widespread genericisation of high-volume drugs, notably Sertraline hydrochloride. Despite accounting for over a quarter of all antidepressant items nationally, Sertraline's contribution to total cost is proportionally lower, reflecting a significantly reduced unit cost (overall mean cost per item: £2.37). Regional analysis further highlighted variations in Sertraline's mean cost per item, with the South East recording the highest (£2.74) and North East and Yorkshire the lowest (£2.14). This project underscores the NHS's success in managing pharmaceutical expenditure for antidepressants while effectively meeting growing patient demand.

2. Introduction

Antidepressants represent a significant component of pharmaceutical expenditure and mental healthcare provision within the National Health Service (NHS) in England. Understanding the trends in their prescribing volume and cost is crucial for effective resource allocation, policy development, and ensuring the sustainability of mental health services. This report provides a data-driven examination of these trends over a four-year period, from 2021 to 2025, considering national, regional, and specific drug contributions.

The analysis leverages a dataset grouped by NHS Region, year, and year-month, detailing the volume (items) and cost of each antidepressant drug prescribed, allowing for a granular understanding of the underlying dynamics. A particular focus is placed on Sertraline hydrochloride, given its pivotal role in national volume and cost trends.

3. Methodology

The analysis was conducted using aggregated monthly data for antidepressant prescriptions across NHS England from January 2021 to March 2025. Key metrics examined included:

- Total Monthly National Prescribing Cost: Evaluated for overall trends and seasonality.
- Monthly Trends for Top Antidepressant Drugs: Separated by both total cost and total items to identify specific drug dynamics.

- Total Annual National Prescribing: Aggregated annually for both items and cost to observe macro trends.
- Regional Prescribing Data: Annual total items and costs were broken down by NHS region to identify geographical variations.
- Drug Contribution Analysis: Overall percentage contributions of individual drugs to total items and total costs were calculated to assess their relative cost-efficiency.
- Cost Distribution: Annual statistical summaries (min, Q1, median, Q3, max) of monthly national costs were used to understand variability and central tendencies.
- Sertraline Hydrochloride Specific Analysis: Detailed examination of Sertraline's percentage contribution to total items and cost, its overall mean cost per item, and regional variations in its mean cost per item and total spending.

The 2025 data consistently represents a partial year (January to March), which was taken into account during interpretation to avoid misrepresenting trends.

4. Results and Analysis

4.1 National Antidepressant Cost Trends

The "National Monthly Cost" plot (Figure 1) reveals a striking pattern. In early 2021, monthly costs peaked around £32.5 million. Following this, a dramatic decline was observed throughout 2021, reaching below £17.5 million by December 2021. From early 2022 to early 2025, costs largely stabilised within a narrower band, typically between £1.75 million and £2.25 million. Although some monthly fluctuations and a notable spike in May/June 2024 were observed, the overall trajectory indicated a new, lower baseline for national antidepressant expenditure.

The "Annual Mean Monthly National Prescribing Cost" bar chart (Figure 2) further corroborates this, showing a sharp drop in the average monthly cost from approximately £24.5 million in 2021 to around £19.0 million in 2022, maintaining this lower average through 2024. This consistent reduction and subsequent stabilisation suggests a significant, sustained shift in the cost landscape. The "Distribution of Monthly National Prescribing Costs by Year" table (Table 3) supports this, with all cost metrics (Min, Q1, Median, Q3, Max) showing a substantial shift downwards from 2021 to 2022, and reduced monthly variability thereafter.

4.2 Volume vs. Cost Dynamics of Top Antidepressants

A key insight emerges from comparing the trends of top antidepressant drugs by cost and by items. The "Monthly Trend: Top Antidepressant Drugs by Cost" (Figure 4) shows Sertraline hydrochloride's cost plummeting from nearly £14 million in early 2021 to consistently below £6 million from 2022 onwards, despite a temporary spike in mid-2024. In stark contrast, the "Monthly Trend: Top Antidepressant Drugs by Items" (Figure 5) demonstrates that Sertraline hydrochloride consistently remained the most prescribed antidepressant throughout the

entire period, with its monthly item count steadily increasing, often exceeding 2 million items.

This divergence is critical: the substantial drop in national antidepressant costs in 2021 was overwhelmingly driven by a reduction in the price per item of Sertraline hydrochloride, not a decrease in its prescribing volume. This strongly suggests the impact of patent expiry and the widespread availability of cheaper generic versions of Sertraline.

Furthermore, the "Overall contribution percentages for each drug" table (Table 4) quantifies this. Sertraline hydrochloride accounts for 25.67% of all antidepressant items but only 21.99% of the total cost, indicating its strong cost-efficiency post-genericisation. The overall mean cost per item for Sertraline hydrochloride across the entire period is £2.37. Conversely, Venlafaxine, while ranking 6th in items (6.44%), jumps to 2nd in cost (16.52%), highlighting its significantly higher average unit cost. Other older generics like Amitriptyline hydrochloride and Citalopram hydrobromide also show high cost-efficiency (e.g., Amitriptyline: 17.69% items, 9.71% cost).

The mid-2024 cost spike observed in the monthly national cost chart and the individual drug cost chart was not matched by a corresponding spike in item numbers for these drugs. This indicates that this temporary increase was driven by an increase in the unit cost of multiple drugs, rather than a surge in prescription volume, possibly due to inflationary pressures, supply chain dynamics, or procurement adjustments.

4.3 Annual National Trends: Items and Cost

The "Total Annual Antidepressant Prescribing (Items) Nationally" and "Total Annual Antidepressant Prescribing Cost Nationally" bar charts (Figure 6) provide a clear summary. The number of antidepressant items prescribed nationally showed a consistent increase from approximately 83 million in 2021 to over 90 million in 2024. Simultaneously, the total annual cost dropped sharply from nearly £300 million in 2021 to around £225 million in 2022, remaining stable at this level through 2024.

This robust evidence confirms that the NHS has successfully managed to absorb a growing demand for antidepressant prescriptions while reducing and then stabilizing overall expenditure, predominantly through cost savings realised from generic drug availability.

4.4 Regional Variations

"Table 1: Total Annual Antidepressant Prescribing per Region (Items)" shows that all NHS regions experienced an increase in antidepressant items from 2021 to 2024. North East and Yorkshire (17.1% increase) and London (15.1% increase) exhibited the highest growth rates, while South East (6.8%) and South West (4.0%) had the lowest. Midlands and North East and Yorkshire consistently had the highest absolute item volumes.

"Table 2: Annual Antidepressant Prescribing Cost per Region (£ Millions)" demonstrates that all regions also saw substantial cost reductions from 2021 to 2024, ranging from -18.8% (North East and Yorkshire) to -24.4% (South West). This universal cost reduction across regions, despite varying item growth rates, strongly supports the pervasive impact of national factors like genericisation.

Specific to Sertraline Hydrochloride:

While the North East and Yorkshire region recorded the highest total spending on Sertraline, it also exhibited the lowest mean cost per item for Sertraline at £2.14. Conversely, the South East region had the highest mean cost per item for Sertraline, at £2.74, despite not being the region with the highest overall total spending on Sertraline. The South West region recorded the lowest total spending on Sertraline. These regional variations in mean cost per item for a single drug like Sertraline highlight differences in procurement, local prescribing practices, or patient-specific needs leading to different formulations/strengths being prescribed.

4.5 Seasonal Variation

While some subtle monthly fluctuations were observed in the "National Monthly Cost" and "Monthly Trend: Top Antidepressant Drugs by Items" plots, a strong, consistent, and annually repeating seasonal pattern in costs was not clearly evident. The most prominent cost spikes (e.g., May/June 2024) did not consistently align with known patterns of increased antidepressant prescribing volume (which often peak in autumn/winter due to Seasonal Affective Disorder). This suggests that factors beyond mere seasonal changes in demand, such as drug price fluctuations or procurement cycles, might be more influential in shaping cost variations.

5. Discussion and Implications

The analysis provides compelling evidence of the NHS's success in controlling antidepressant prescribing costs while accommodating increasing demand. The dramatic shift in national expenditure is a testament to the effectiveness of pharmaceutical policies promoting generic uptake. Sertraline hydrochloride serves as a prime example of this success, contributing a significant volume of prescriptions at a proportionally lower cost due to its reduced unit price post-genericisation. The overall mean cost per item for Sertraline at £2.37 underscores its efficiency relative to other drugs.

The continued rise in antidepressant item numbers across all regions indicates a growing reliance on pharmacotherapy for mental health conditions. This could reflect increased prevalence of conditions post-pandemic, improved diagnosis, reduced societal stigma around seeking help, or enhanced access to prescribing services. Regardless of the underlying cause, this growing volume places increasing demands on primary care and pharmacy services, requiring commensurate resource planning.

The identified disparities in unit costs among different drugs (e.g., high unit cost of Venlafaxine, Duloxetine, and specialized drugs like Vortioxetine, Trimipramine maleate, and Tranylcypromine sulfate) present ongoing opportunities for cost management. While high-volume generic drugs have delivered significant savings, attention may now shift to optimising the prescribing patterns or negotiating prices for drugs that contribute disproportionately to total cost due to their high unit prices.

Regional variations in mean cost per item for Sertraline (e.g., South East vs. North East and Yorkshire) suggest that while national genericisation has been broadly effective, there may still be local opportunities for cost optimization, perhaps through best practice sharing in procurement or prescribing habits. Understanding the drivers behind these regional differences could yield further efficiencies.

The observed cost stability from 2022 onwards provides greater predictability for budgeting. However, the temporary cost spikes highlight the need for continuous vigilance against inflationary pressures, supply chain disruptions, or the introduction of new, expensive drugs that could impact this stability.

6. Conclusion

The analysis of NHS antidepressant prescription trends from 2021 to 2025 demonstrates a dual narrative: a consistent increase in the volume of prescriptions coupled with a remarkable success in cost containment. The widespread genericisation of high-volume drugs, particularly Sertraline hydrochloride, was the primary driver of significant cost reductions across all regions. This enabled the NHS to manage a continually increasing volume of antidepressant prescriptions with stable or even reduced overall expenditure.

Sertraline hydrochloride's role as the most prescribed antidepressant, yet having a proportionally lower cost contribution due to its overall mean cost per item of £2.37, exemplifies the success of generic drug policies. However, regional variations in Sertraline's mean cost per item indicate potential for further local optimization.

While the NHS has effectively managed its pharmaceutical expenditure for antidepressants to date, the ongoing rise in demand necessitates continued strategic planning. Future efforts should focus on sustaining generic uptake, scrutinizing high-unit-cost drugs, ensuring equitable access to care across regions, and aligning resource allocation with the growing demand for mental health support.

Appendix

Figure 1: National Monthly Cost

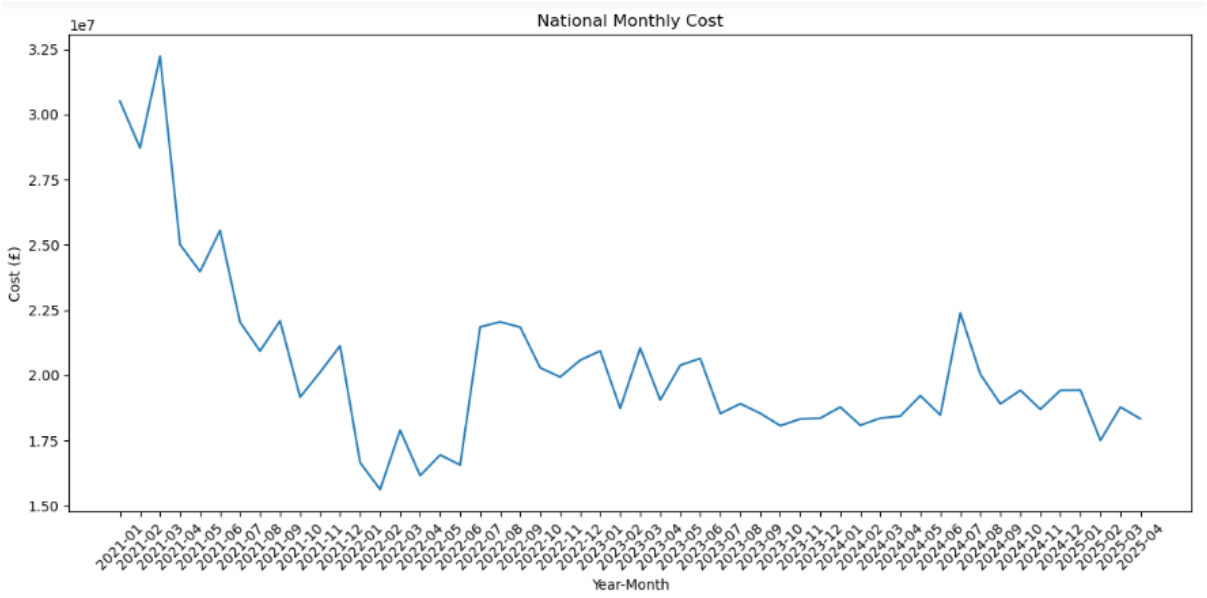

Figure 2: Annual Mean Monthly National Prescribing Cost

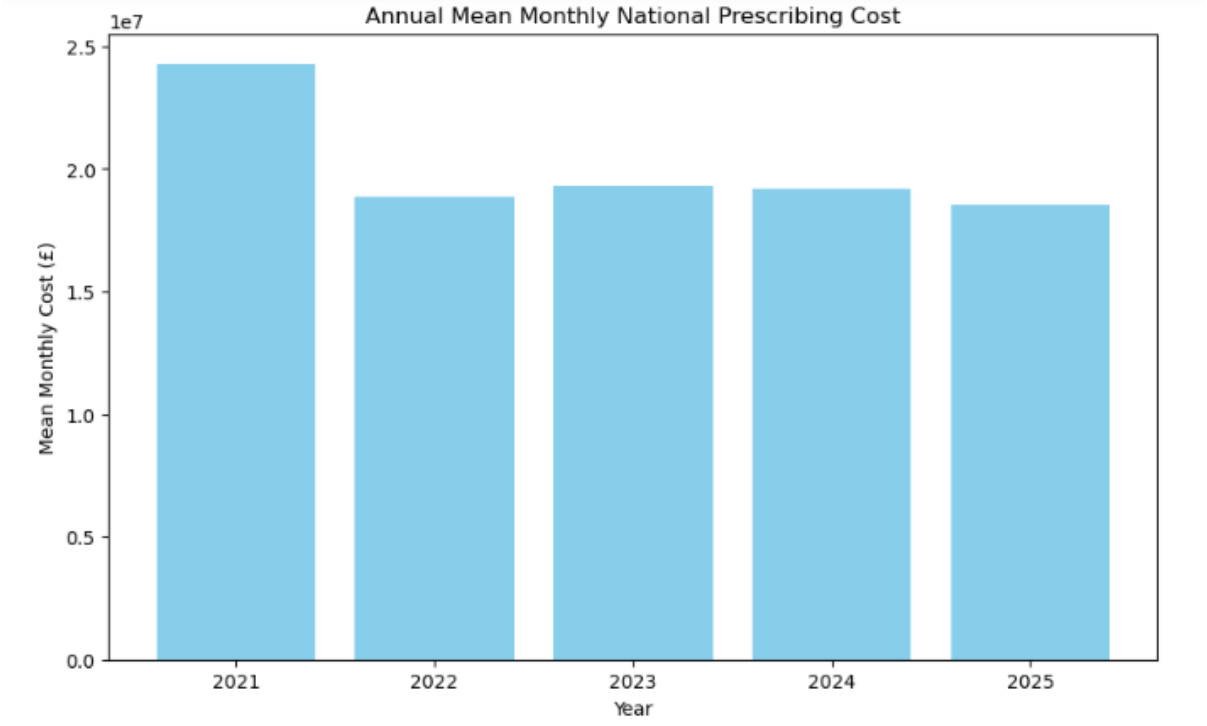

Figure 3: Total Annual Antidepressant Prescribing (Items) Nationally & Total Annual Antidepressant Prescribing Cost Nationally

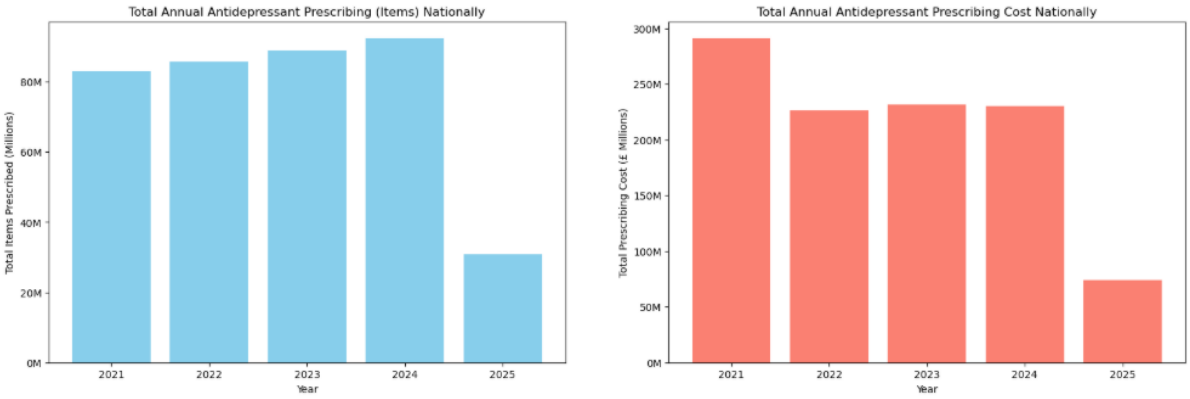

Figure 4: Monthly Trend: Top Antidepressant Drugs by Cost

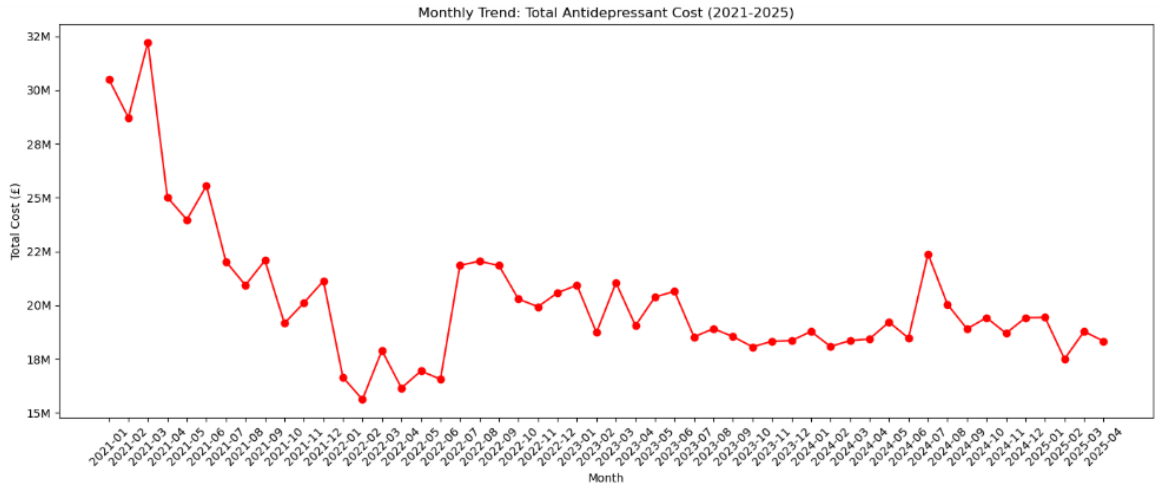

Figure 5: Monthly Trend: Top Antidepressant Drugs by Items

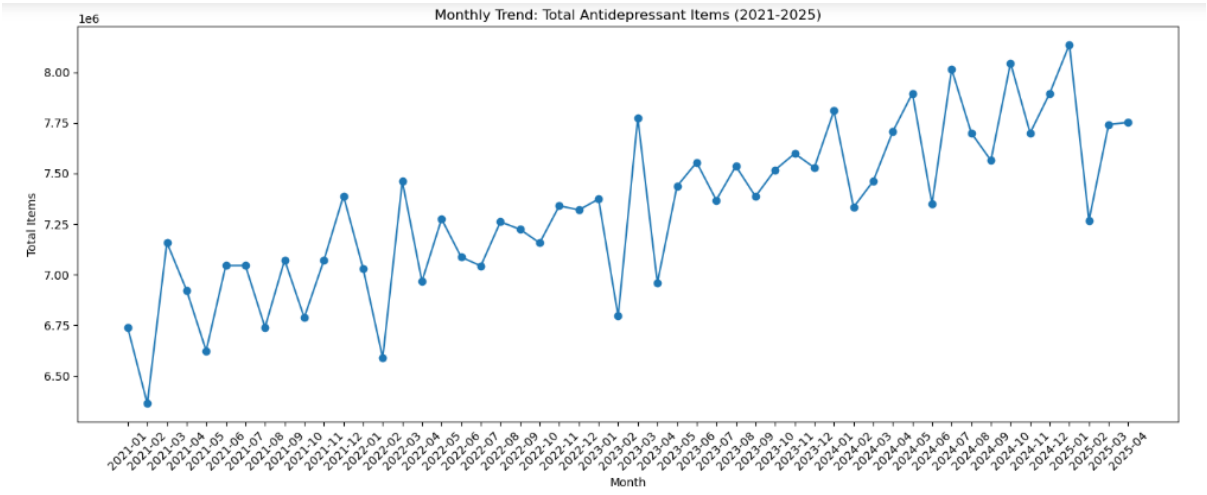

Figure 6: 10 Most Prescribed Antidepressants (Total Items 2021-2025) & 10 Most Expensive Antidepressants (Total Cost 2021-2025)

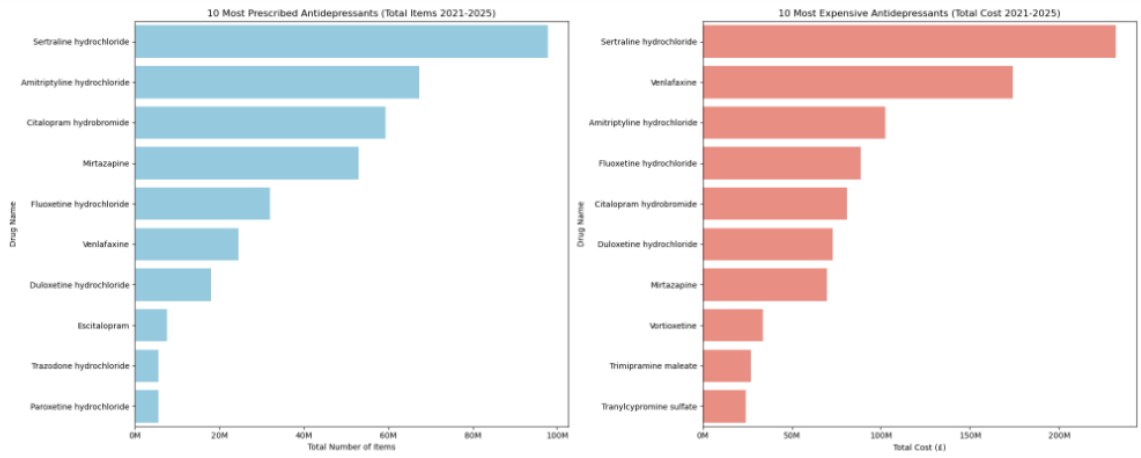

Table 1: Total Annual Antidepressant Prescribing per Region (Items)

YEAR	2021	2022	2023	2024	2025	Change_2021_2024
REGION_NAME						
EAST OF ENGLAND	9699149	9923442	10204132	10511229	3494607	8.4
LONDON	8644409	9305059	9811761	9953948	3191340	15.1
MIDLANDS	15436017	16130321	16817296	17476788	5851827	13.2
NORTH EAST AND YORKSHIRE	17750721	18329287	19100119	20779391	7198741	17.1
NORTH WEST	12468335	12833009	13265475	13730488	4559653	10.1
SOUTH EAST	10639433	10848010	11089609	11366165	3766154	6.8
SOUTH WEST	8323915	8387069	8542825	8657500	2836293	4.0

Table 2: Annual Antidepressant Prescribing Cost per Region (£ Millions)

YEAR	2021	2022	2023	2024	2025	Change_2021_2024
REGION_NAME						
EAST OF ENGLAND	32898810.41	25820590.34	26248425.22	26231250.29	8529704.24	-20.3
LONDON	32040317.87	25493114.13	26492825.12	25889720.85	7871708.83	-19.2
MIDLANDS	54660728.89	42573110.95	44035768.67	44055957.05	14370561.28	-19.4
NORTH EAST AND YORKSHIRE	54887869.51	41971436.93	43398636.48	44576523.91	14778227.69	-18.8
NORTH WEST	42449533.83	31904245.56	32452392.01	32136058.14	10388104.04	-24.3
SOUTH EAST	44718283.20	35511314.54	35540021.85	34830350.88	11043443.51	-22.1
SOUTH WEST	29824347.28	23143945.26	23394154.11	22540988.86	7081586.15	-24.4

Table 3: Distribution of Monthly National Prescribing Costs by Year

	YEAR	MIN_COST	Q1_COST	MEDIAN_COST	Q3_COST	MAX_COST
0	2021	19165751.92	2.108352e+07	2.303388e+07	2.634587e+07	32228464.39
1	2022	15624554.54	1.663365e+07	1.891767e+07	2.089898e+07	22050128.20
2	2023	18071220.70	1.849039e+07	1.882394e+07	2.045244e+07	21048253.38
3	2024	18086671.23	1.846735e+07	1.884535e+07	1.942690e+07	22390495.89
4	2025	17507215.78	1.812803e+07	1.856028e+07	1.894809e+07	19435557.93

Table 4: Overall contribution percentages for each drug

	BNF_CHEMICAL_SUBSTANCE	Items_Percent	Cost_Percent
25	Sertraline hydrochloride	25.670790	21.987452
1	Amitriptyline hydrochloride	17.685068	9.708757
3	Citalopram hydrobromide	15.586147	7.665310
17	Mirtazapine	13.911742	6.617696
10	Fluoxetine hydrochloride	8.387595	8.393665
30	Venlafaxine	6.436799	16.515542
8	Duloxetine hydrochloride	4.723074	6.928627
9	Escitalopram	1.992116	1.424070
27	Trazodone hydrochloride	1.453646	1.894254
22	Paroxetine hydrochloride	1.446480	1.458188