

General Practice Prescribing Trends in England and Wales Annual Review 2015

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First published 2016 by Cogora.
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Abbreviations

BAPEN	British Association for Parenteral and Enteral Nutrition
BMI	Body Mass Index
BNF	British National Formulary
CCG	Clinical Commissioning Group
CHM	Commission of Human Medicines
COPD	Chronic obstructive pulmonary disease
EMA	European Medicines Agency
GSK	GlaxoSmithKline
HSCIC	Health and Social Care Information Centre
ILAE	International League Against Epilepsy
MHRA	Medicine and Healthcare Products Regulatory Agency
NHS	National Health Service
NIC	Net ingredient cost
NICE	National Institute for Health and Care Excellence
NSAID	Non-steroidal anti-inflammatory drugs
RCGP	Royal College of General Practitioners
ONS	Office for National Statistics
OPDA	Opioid Painkiller Dependence Alliance
WHO	World Health Organization

Executive summary

In our second annual review of English and Welsh general practice prescribing data, we found that the total NIC associated with general practice prescriptions amounted to £9.58 billion in 2015, up from £9.16 billion in 2014. The areas associated with the highest NIC spending were diabetes drugs, respiratory corticosteroids, analgesics, antiepileptics and oral nutrition products, in descending order.

For the second year in a row we found an increase in the quantity of strong opioids prescribed. Despite their addictive nature, the quantity of strong opioids prescribed had increased by 10% relative to 2014.

Diabetes drugs continued to account for the highest spending, with a total NIC of £992 million spend on diabetes drugs in 2015. Interestingly, spending on prescriptions for diabetes drugs, as a percentage of overall spending on prescriptions, was highest in CCGs that were categorised as deprived urban CCGs with younger people and ethnic diversity, particularly with Asian and Black minorities. As noted by Dr Ahmad, Clinical Director of Dementia and Diabetes in Merton CCG and Diabetes UK Clinical Champion, this begs the question why more is not done to address the problem of diabetes in ethnic minorities.

Analysis of antiepileptic prescribing data also revealed interesting findings. Despite the MHRA emphasising the need to ensure consistent supply of a particular product for category 1 antiepileptics, due to the risk of adverse events that could arise from patients receiving another version of these drugs, approximately half of all category 1 antiepileptics were prescribed generically in 2015.

For the second year in a row, Seretide® was identified as the branded pharmaceutical with the highest total NIC spend (£164 million). However, our data show that both the total number of Seretide® units prescribed, and associated total NIC, have decreased between 2013 and 2015. With the recent introduction of cheaper generic versions of the drug in the UK, it is possible that Seretide®'s market share will continue to decrease over the coming year. Other branded pharmaceuticals to note are Lyrica® and Incruse® Ellipta®, identified as the branded pharmaceuticals with the greatest numerical increase and greatest percentage increase in total NIC, respectively, relative to 2014.

Methodology

Source

The Health and Social Care Information Centre (HSCIC) and NHS Wales record and publish data on prescribing activity in all general practices in England and Wales, respectively. When producing this report, we used Cogora's proprietary, in-house Rx software to analyse these data and identify trends in prescription volumes, and the associated net ingredient cost (NIC), of general practice prescriptions issued between 1 January 2015 and 31 December 2015.

Definitions

The volume of prescribed and dispensed drugs was calculated by measuring the quantity of a specific drug, or type of drugs, that was dispensed within the defined period. The quantity was defined as the number of tablets or capsules or, if the formulation is in a liquid or solid form, the millilitres or number of grammes.

The cost of pharmaceutical prescriptions was calculated using two separate measurements: the total NIC and the NIC per registered patient. The total NIC means the total NIC associated with prescriptions for any given drug, or type of drugs, within the defined period. The NIC per registered patient refers to the total NIC divided by the number of registered patients in the regions included in the analysis. As such, the NIC per registered patient measurement takes into account any differences in the size of the patient pool of different regions, whereas the total NIC measurement does not.

To compare prescribing activity across therapy areas, Cogora segmented prescription volume and NIC data according to the British National Formulary (BNF) section that individual prescriptions fell into, and by the chemical name of prescribed pharmaceuticals.

Analysis

The NIC per registered patient was calculated by combining raw prescribing activity data with patient registration data published by the HSCIC¹ and provided by the NHS Wales Informatics Service². The patient registration data used reflected the total number of patients registered in general practices in England on 31 December 2015 and in Wales on 15 December 2015.

It is noted that when calculating the NIC per registered patient for England, Cogora used data showing the number of registered patients in each Clinical Commissioning Group (CCG) rather than the number of registered patients in each general practice. This is because the HSCIC suppresses data for general practices with fewer than 100 patients in order to prevent identification of individual patients. Therefore, CCG level data on the number of registered patients were considered a more accurate measure.

During analysis, Cogora grouped prescribing data into geographical regions or, for England, into CCG clusters reflecting the sociodemographic characteristics of their patient pool, in line with a grouping previously used by NHS England³. When segmenting English data according to geography, Cogora excluded prescription data that the HSCIC had attributed to a local authority or regional cluster. It is noted that these prescription data accounted for only 0.5% of total NIC.

Cogora identified the top-performing branded pharmaceuticals in the calendar year of 2015 by determining the branded pharmaceuticals that had the highest total NIC in 2015, the greatest increase in total NIC comparing the calendar years of 2014 and 2015 and, finally, the highest percentage increase in total NIC when comparing the calendar years of 2014 and 2015. When calculating the two latter categories, Cogora only included branded pharmaceuticals that were prescribed from 1 January 2015 and 31 December 2015 and that were associated with a total NIC of £1 million or higher in 2015.

Introduction

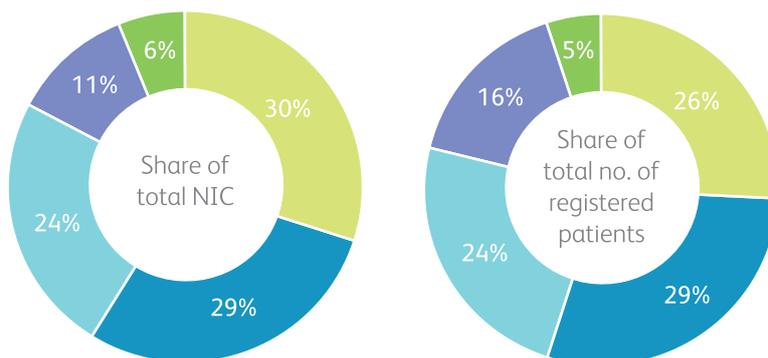
Primary care has previously been estimated to account for 90% of all patient contact with the National Health Service (NHS)⁴ and also has responsibility for maintaining many treatments initiated in secondary care. General practice prescribing data therefore provide valuable insight into the overall burden different therapy areas place on the NHS. In our second annual review of primary care prescribing trends, we report on English and Welsh prescribing trends in the calendar year 2015, with a specific focus on the five therapy areas associated with the greatest spend in 2015.

Regional variance in spending on prescribed medicines

In the calendar year of 2015 the total NIC associated with prescriptions issued in all English and Welsh general practices was £9.6 billion, up from £9.2 billion in 2014. The highest spend on prescriptions was observed in the North of England where a total NIC of £2.9 billion, corresponding to approximately one-third (30%) of the total NIC in the entirety of England and Wales, was recorded in 2015 (Figure 1). This was likely driven, in part, by the number of patients living in the North of England. Conversely, the lowest total NIC (£1.1 billion in 2015, 11% of total NIC) was observed in London, which was home to 16% of all registered patients in 2015.

Figure 1. Regional distribution of total NIC and total number of registered patients

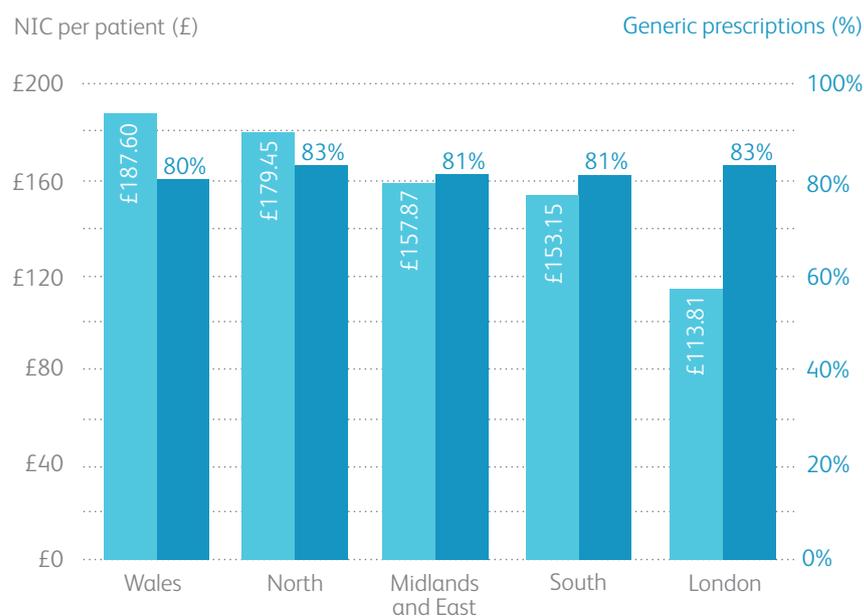
- North
- Midlands and East
- South
- London
- Wales



To allow spending between regions with different sized patient pools to be compared, we also calculated the NIC per registered patient. In line with the findings in the previous year's report⁵, the highest NIC per registered patient in the calendar year of 2015 was observed in Wales (£187.60) and the lowest NIC per registered patient in London (£113.81) (Figure 2). In both regions there had been an increase from 2014 when the NIC per registered patient was £181.63 and £111.19 in Wales and London, respectively. The 2015 data also showed that Wales and London had the lowest and highest levels of generic prescribing, respectively (Figure 2). It is therefore likely that their spending patterns reflect different attitudes to prescribing cheaper generic, rather than branded, drugs.

Figure 2. NIC per registered patient and percentage of units that were prescribed generically

- NIC per registered patient
- Percentage of all units prescribed generically



Key therapy areas

The therapy area with the highest total NIC in 2015 was diabetes (Figure 3). This was also the therapy area where the largest percentage increase in total NIC between 2014 and 2015 was observed (Table 1). The other areas with the highest total NIC in 2015 were respiratory corticosteroids, analgesics, antiepileptics and oral nutrition, in descending order (Figure 3). Together, these five areas accounted for approximately one-third (34.5%) of the total NIC spend in 2015. It is noted that these were the same areas that were identified as the top areas in 2014⁵.

Figure 3. Therapy areas with the highest total NIC in 2013, 2014 and 2015

- 2015
- 2014
- 2013

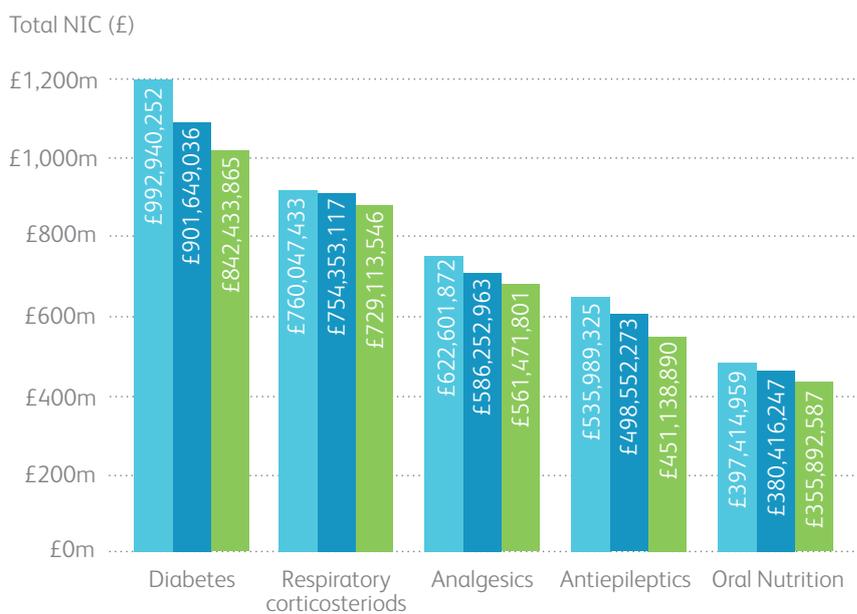


Table 1. Change in total NIC associated with prescriptions for each of the top 5 therapy areas between 2013 and 2014, and between 2014 and 2015

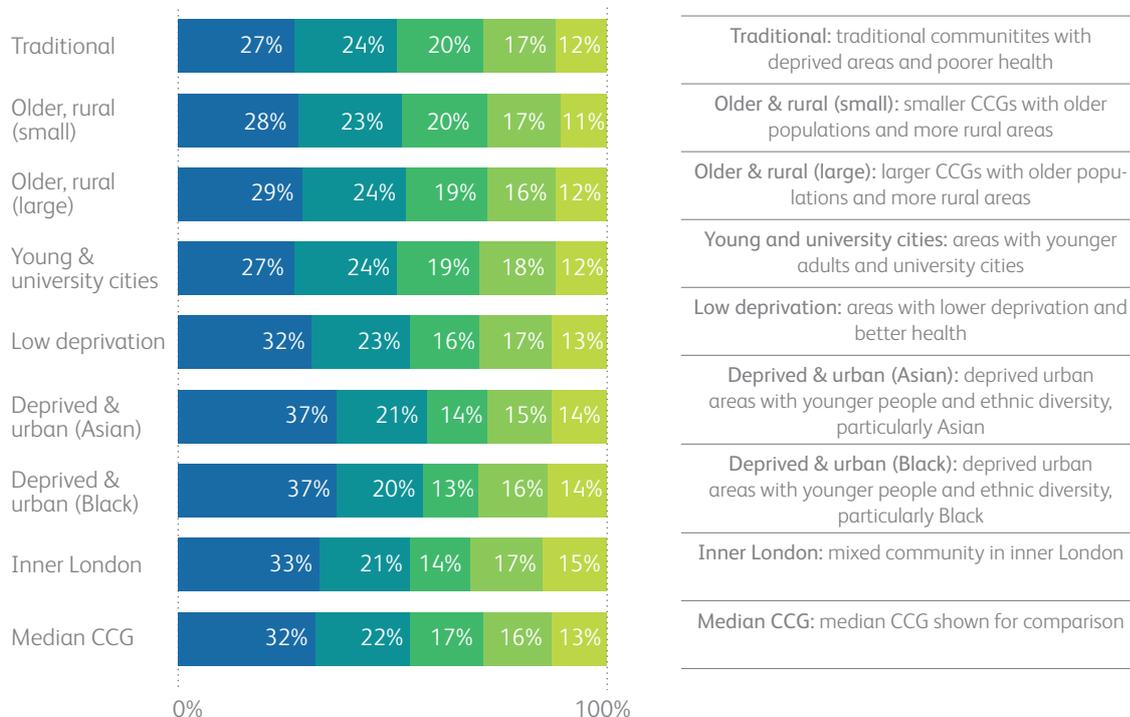
Therapy area	Change in total NIC 2014-2015 (%)	Change in total NIC 2013-2014 (%)
Diabetes	10.12%	7.03%
Antiepileptics	7.51%	10.51%
Analgesics	6.20%	4.41%
Oral nutrition	4.47%	6.89%
Respiratory corticosteroids	0.75%	3.46%

Overall, the total NIC associated with general practice prescriptions for the top five therapy areas had increased by 6.0% relative to 2014. However, the increase was not the same across the five disease areas. The greatest increase was observed for diabetes drugs (10.1%) while respiratory corticosteroids had the lowest increase in total NIC (0.8%) of the five therapy areas (Table 1).

Interestingly, the total NIC spend between CCGs clusters with different sociodemographic and geographical profiles. Notably, spending on diabetes drugs was above-average in deprived urban areas with younger people and ethnic diversity, particularly with Asian and Black minorities (Figure 4). There were also variations in total NIC associated with prescriptions for analgesics, which was above-average particularly in traditional communities with deprived areas and poorer health and in CCGs with older populations and more rural areas.

Figure 4. Proportion of total NIC spent on prescriptions for the top 5 therapy areas in CCGs with different sociodemographic characteristics

- Diabetes
- Respiratory
- Analgesics
- Antiepileptics
- Oral nutrition



Percentages have been rounded to nearest full number and therefore do not add up to 100%

Top performing branded pharmaceuticals in 2015

Branded pharmaceuticals with greatest share of total NIC

To identify the top performing branded pharmaceuticals of 2015, we compared the total NIC associated with prescriptions for branded pharmaceuticals. Five of the ten top performing drugs were indicated for diabetes and four were respiratory corticosteroids (Table 2). Notably, three of the drugs in the top ten list were the same as in 2014⁵.

For the second year in a row, the leading branded pharmaceutical was the respiratory corticosteroid Seretide[®] (total NIC of £164 million). However, while maintaining its lead over other branded pharmaceuticals, the total NIC associated with Seretide[®] had decreased by 8% relative to 2014. With an increasingly competitive landscape, exemplified by e.g. Mylan's launch of a generic version of Seretide[®] sold under the name Sirdupla^{®6}, there is a high likelihood that Seretide[®]'s performance will continue shifting over 2016.

Table 2. Top 10 branded pharmaceuticals with the largest share of total NIC in 2015 and percentage change from 2014

No. (Change in rank)	Top product	Product details	Total NIC 2015	% change from 2014
1 (=)	Seretide [®]	Respiratory corticosteroid	£164,347,022	-8% ▼
2 (=)	Symbicort [®]	Respiratory corticosteroid	£105,393,197	19% ▲
3 (=)	NovoRapid [®]	Diabetes drug	£78,600,070	5% ▲
4 (=)	Lantus [®]	Diabetes drug	£73,983,973	2% ▲
5 (NEW)	Lyrica [®]	Antiepileptic. Also indicated for neuropathic pain and generalised anxiety disorder*	£62,519,422	6276% ▲
6 (-1)	NovoMix [®]	Diabetes drug	£54,544,550	-4% ▼
7 (+2)	Fostair [®]	Respiratory corticosteroid	£54,067,058	72% ▲
8 (-2)	Clenil Modulite [®]	Respiratory corticosteroid	£50,226,675	-2% ▼
9 (-1)	Levemir [®]	Diabetes drug	£42,719,489	1% ▲
10 (-3)	Aviva [®]	Diabetes drug	£41,889,709	-1% ▼

*Based on its BNF code, Lyrica[®] has been classed as an antiepileptic in this report. However, it is noted that it is also indicated for neuropathic pain and generalised anxiety disorder and that the increase in total NIC may be specifically due to increased named prescribing for neuropathic pain

Branded pharmaceuticals with greatest numerical increase in total NIC

A further analysis was conducted to identify the branded pharmaceuticals with the highest numerical increase in total NIC when comparing 2015 to 2014 data (Table 3). The top performing drug in this analysis was Lyrica[®]. The exact reason for this growth is unclear as the Rx data do not specify for which of the Lyrica[®]'s three indications (neuropathic pain, epilepsy or generalised anxiety disorder⁷) a prescription was made. However, the dramatic increase is likely to be, at least in part, related to a High Court ruling made in February 2015, according to which all prescriptions of pregabalin (the active ingredient) for neuropathic pain must be made under the branded name, Lyrica^{®8}. In line with this, the Opioid Painkiller Dependence Alliance (OPDA, www.opdalliance.org) commented on the report findings that there is anecdotal evidence that Lyrica[®] is increasingly prescribed for neuropathic pain.

It is also noteworthy that five of the top ten products in the analysis were respiratory corticosteroids (Fostair[®], Symbicort[®], DuoResp[®] Spiromax[®], Flutiform[®] and Relvar[®] Ellipta[®]). Of these, the greatest numerical increase in total NIC was observed for Fostair[®], which was the second-highest ranked drug in the analysis (Table 3). Fostair[®]'s total NIC had increased by £23 million relative to 2014. It is possible this was, in part, due to an extension in its indication to also include COPD in April 2014⁹.

Table 3. Branded pharmaceuticals with the largest numerical increase in total NIC when comparing 2014 and 2015

Product	Product details	Increase in NIC 2014-2015	Total NIC 2015
Lyrica®	Antiepileptic. Also indicated for neuropathic pain and generalised anxiety disorder*	£61,538,921	£62,519,422
Fostair®	Respiratory corticosteroid	£22,561,651	£54,067,058
Symbicort®	Respiratory corticosteroid	£16,723,308	£105,393,197
DuoResp Spiromax®	Respiratory corticosteroid	£6,768,543	£6,915,276
Flutiform®	Respiratory corticosteroid	£5,874,872	£14,336,888
Longtec®	Analgesic	£5,051,707	£10,042,092
Glucorx®	Diabetes drug	£4,594,123	£13,103,817
Relvar Ellipta®	Respiratory corticosteroid	£4,431,730	£4,762,892
Fultium-D3®	Vitamin	£4,012,898	£8,851,256
Contour Next®	Diabetes drug	£3,725,510	£15,936,552

*Based on its BNF code, Lyrica® has been classed as an antiepileptic in this report. However, it is noted that it is also indicated for neuropathic pain and generalised anxiety disorder and that the increase in total NIC may be specifically due to increased named prescribing for neuropathic pain

Branded pharmaceuticals with greatest percentage increase in total NIC

In a third analysis to identify the top performing branded pharmaceuticals of 2015, we compared the percentage increase in total NIC associated with each branded drug between 2014 and 2015. This analysis identified the bronchodilator Incruse® Ellipta® as the top performer (Table 4). Incruse® Ellipta® is a maintenance bronchodilator indicated for the relief of symptoms in adult patients with chronic obstructive pulmonary disease (COPD)¹⁰. It was launched in the UK in October 2014¹¹ and was recommended as a maintenance bronchodilator treatment to relieve symptoms in adult patients with COPD by NHS Wales¹² the same year.

Table 4. Branded pharmaceuticals with the largest percentage increase in total NIC when comparing 2014 and 2015

Product	Product details	% change in NIC	Total NIC 2015
Incruse Ellipta®	Bronchodilator	24045%	£1,381,104.49
Lyrica®	Antiepileptic. Also indicated for neuropathic pain and generalised anxiety disorder*	6276%	£62,519,422.07
Duoresp Spiromax®	Respiratory corticosteroid	4613%	£6,915,276.18
Anoro Ellipta®	Compound bronchodilator	3584%	£1,357,847.97
Bexsero®	Vaccines and Antisera	1897%	£2,036,658.92
Ebesque XL®	Antipsychotic drugs	1806%	£1,855,425.03
Relvar Ellipta®	Respiratory corticosteroid	1338%	£4,762,891.72
Shortec®	Opioid analgesics	445%	£1,360,521.37
Nimenrix®	Vaccines and Antisera	365%	£1,448,040.06
Typherix®	Vaccines and Antisera	342%	£1,298,416.20

*Based on its BNF code, Lyrica® has been classed as an antiepileptic in this report. However, it is noted that it is also indicated for neuropathic pain and generalised anxiety disorder and that the increase in total NIC may be specifically due to increased named prescribing for neuropathic pain

Diabetes

Diabetes mellitus is a chronic metabolic disease for which there is no curative treatment at present. Clinical guidelines in the UK currently recommend that a combination of pharmacological and behavioural interventions, such as dietary advice, are used to manage the disease^{13,14}. The pharmacological treatments primarily consist of pharmacotherapies used to control blood glucose levels, such as insulin. However, pharmacotherapies used to treat associated medical conditions, such as increased blood pressure, dangerous blood lipid levels, increased risk of cardiovascular events, kidney damage and eye or nerve damage, are also recommended^{13,14}.

The need for chronic pharmacological treatment coupled with a high UK prevalence of diabetes (with 2013-2014 data showing that 6.2% of patients over 17 years of age in England had a diabetes diagnosis¹⁵) cause diabetes to present a substantial economic burden on primary care services. However, the true economic impact on the NHS is even greater when taking into account the additional secondary care resources required for treating diabetes. For example, in 2014-2015, there were 48,581 hospital admissions recorded where the patient had a primary diagnosis of diabetes, with a median hospital stay of two days¹⁶.

Prescription trends

Macro trends

The total NIC associated with English and Welsh general practice prescriptions for diabetes drugs amounted to £992 million in the calendar year of 2015 (see Appendix for list of products). This represented a 10% increase in the total NIC compared to 2014 and a 4% increase in the total quantity prescribed.

The geographical regions with the highest total NIC spend on diabetes were the Midlands and East (30% of total NIC) and the North (28% of total NIC) (Figure 5). The highest NIC spend per registered patient was observed in Wales (£19.16). Meanwhile, London had both the lowest NIC per registered patient (£14.42) and the highest level of generic prescribing (82%) (Figure 6). The higher levels of generic prescribing in London may be due to a concerted effort from London CCGs to reduce branded prescribing. As commented by Dr Farooq Ahmad, Clinical Director of Dementia and Diabetes in Merton CCG and Diabetes UK Clinical Champion, a lot of London CCGs have been given generic prescribing targets by medicine management directors.

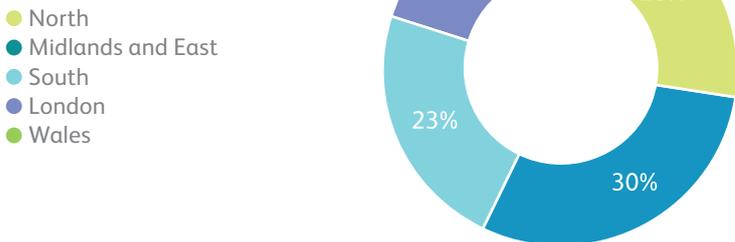
Interestingly, when analysing the data according to the socio-demographic characteristics of the CCGs, the highest total NIC spend (as a percentage of overall NIC) was observed in CCGs described as deprived urban areas with younger people and ethnic diversity, particularly Black or Asian (37% of total NIC, relative to 32% of total NIC in the median CCG) (Figure 4). Dr Ahmad, commenting on the findings, notes this may be because ethnic minorities tend to present late and have other comorbidities, which require a number of medications and perhaps more expensive medications to be prescribed.

“

There is high prevalence of diabetes among Asian and Afro-Caribbean populations in the UK ... Patients from ethnic minorities or more deprived communities may make poor choices with foods and have a carbohydrate-rich diet which is usually cheaper and this can worsen the outcome. I feel it does beg the question why isn't there more done to address the problem of diabetes among ethnic minorities.”

Dr Farooq Ahmad, Clinical Director of Dementia and Diabetes in Merton CCG and Diabetes UK Clinical Champion

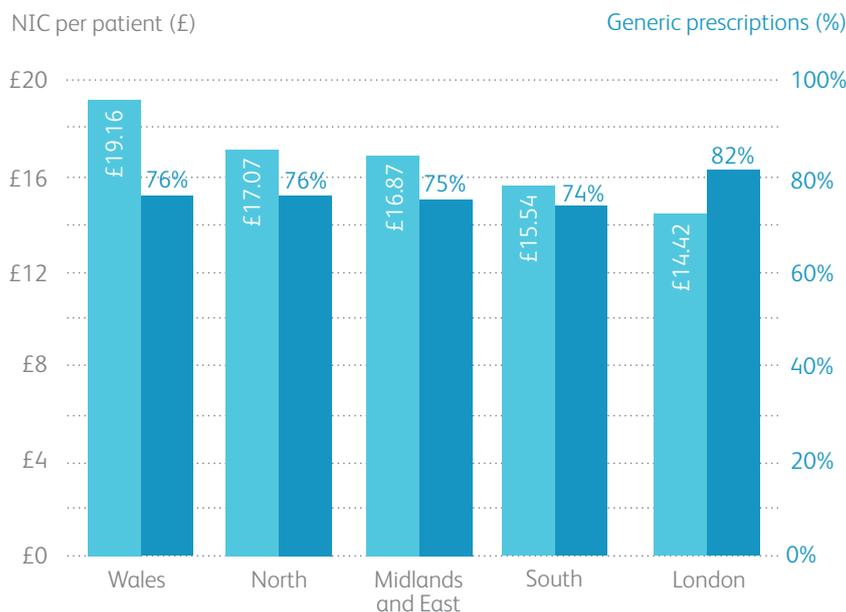
Figure 5. Regional distribution of total NIC for diabetes prescriptions



Percentages have been rounded to nearest full number and therefore do not add up to 100%

Figure 6. NIC per registered patient for diabetes drugs and percentage of all units prescribed generically

- NIC per registered patient
- Quantity prescribed generically



Brand trends

To identify the top performing products, we measured the total NIC associated with prescriptions for branded diabetes drugs in 2015. For the third year in a row, the market leader was NovoNordisk’s insulin NovoRapid®, prescriptions for which amounted to a total NIC of £78.6 million in 2015 (Figure 7). The second-highest ranked product was Sanofi-Aventis’ long-acting insulin Lantus®. With Lantus® losing its patent protection in Europe in 2015 and a cheaper generic version being launched in the UK in August 2015, it is likely that the product will lose market share over the coming years. However, so far Lantus® has successfully protected its market share with the total NIC being £74.0 million in 2015, compared to £72.7 million in 2014. Another interesting trend was the decrease in total NIC associated with prescriptions for NovoMix®, which fell from £56.6 million in 2014 to £54.5 million in 2015.

When analysing the quantity prescribed, rather than associated total NIC, all the the leading diabetes products were reagent strips (Figure 8). For the third year in a row, the top performing reagent strip was Aviva®. A total of 132.9 million strips were prescribed for Aviva® in 2015, and data from previous years show that performance has been stable (Figure 8). Conversely, while OneTouch® maintained its position as the second-highest performing reagent strip, the data showed a continuous decrease in the quantity prescribed between 2013 and 2015. Meanwhile, the data showed a dramatic growth in quantity prescribed of GlucoRx® reagent strips between 2013-2015 – although growth began to slow down in 2015.

Figure 7. Branded diabetes drugs/monitoring tools with the highest total NIC

● 2015
● 2014
● 2013

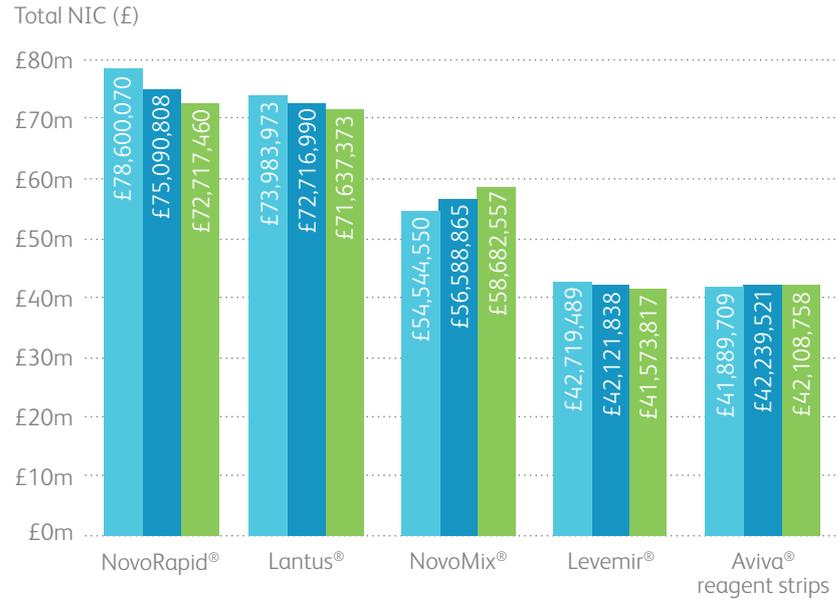
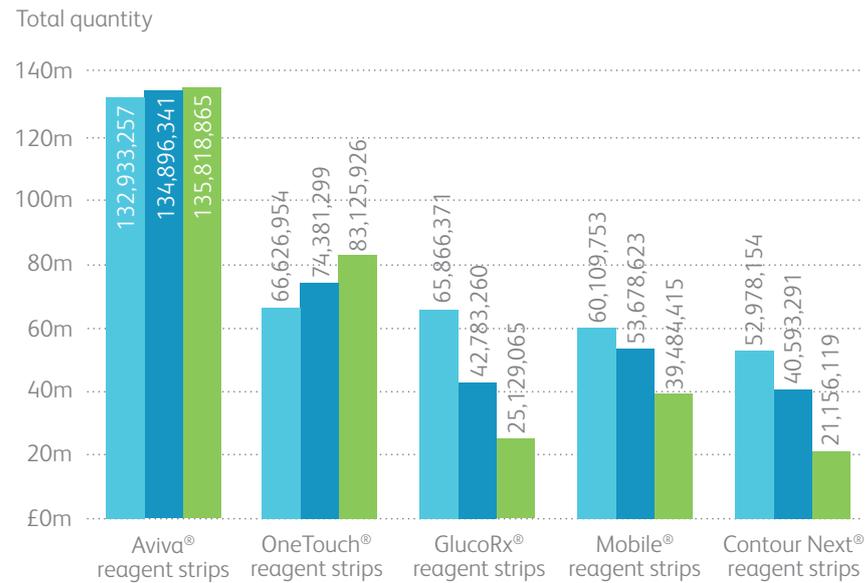


Figure 8. Branded diabetes drugs/monitoring tools with the highest quantities prescribed

● 2015
● 2014
● 2013



Respiratory Corticosteroids

Corticosteroids are recommended for the treatment of respiratory diseases, such as asthma and chronic obstructive pulmonary disease (COPD)^{17,18,19}. In asthma, corticosteroids and combination inhalers are both recommended as an add-on therapy for managing symptoms, and are the first choice preventer drug¹⁸. In COPD, they are predominantly used to reduce the frequency of exacerbations¹⁹.

Asthma and COPD are both common diseases in the UK with the lifetime prevalence of clinically diagnosed asthma in the England estimated at 16% in men and 17% in women in 2010, and the lifetime prevalence for COPD, chronic bronchitis or emphysema estimated at 4% in men and 5% in women the same year²⁰. In addition to the high total NIC associated with pharmacotherapies for respiratory disease, they also demand high levels of secondary care resources with, for example, a total of 2,461,245 hospital admissions where there was a primary or secondary diagnosis of asthma or other chronic obstructive pulmonary disease being recorded in England in 2014-2015¹⁶.

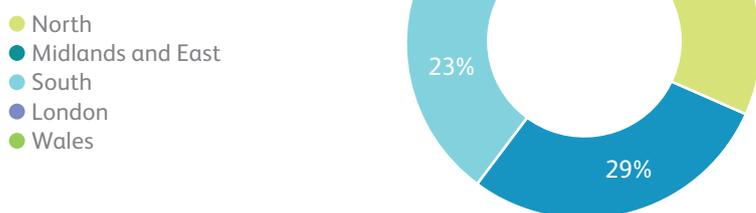
Prescription trends

Macro trends

In 2015, over 28.6 million units of respiratory corticosteroids were prescribed and dispensed, corresponding to a total NIC of £760 million. Segmenting the data by geographic region showed that the regions with the highest spend on respiratory corticosteroids were the North of England (32% of total NIC) and the Midlands and East (29% of total NIC) (Figure 9). Meanwhile, the highest spend per capita was observed in Wales (£17.43 per registered patient) (Figure 10). Conversely, as in 2014⁵, the lowest NIC per registered patient was observed in London. With a NIC of at £7.73 per registered patient London spent less than half of what Wales, and approximately half of what North of England, did per patient.

Just over one-third (36%) of all respiratory corticosteroids units dispensed in 2015 were issued for generic products, and the total NIC of these generic prescriptions accounted for just under half (43%) of the total NIC. However, these low levels of generic prescribing likely reflect the importance of patients' familiarity with inhaler devices, with NHS guidelines recommending that many inhalers are prescribed by brand²¹ as it is recognised that changing the device could impact on the effectiveness of the drug delivered.

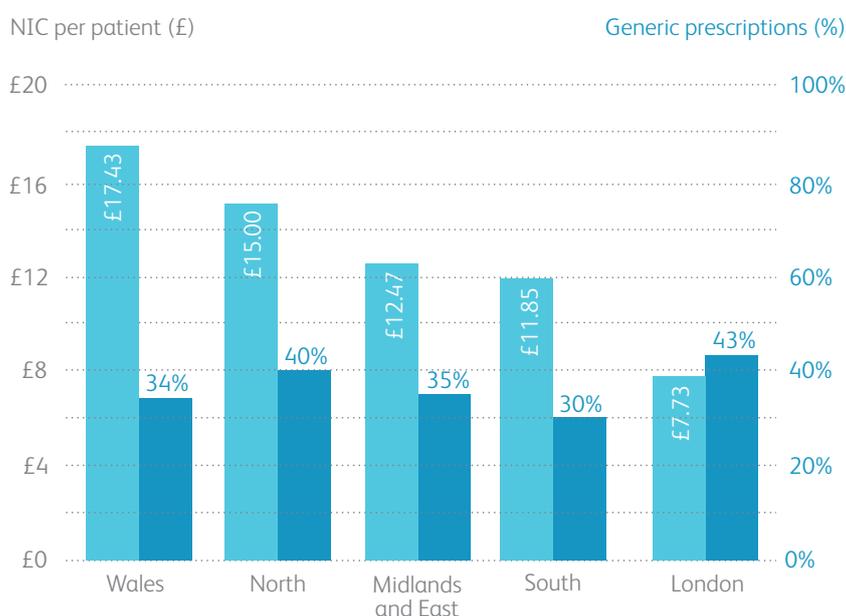
Figure 9. Regional distribution of total NIC for respiratory corticosteroid prescriptions



Percentages have been rounded to nearest full number and therefore do not add up to 100%

Figure 10. NIC per registered patient for respiratory corticosteroid prescriptions and percentage of all units prescribed generically

● NIC per registered patient
● Quantity prescribed generically



Brand trends

To identify the top performing respiratory corticosteroids, we analysed both quantities prescribed in 2015 and the total NIC associated with these prescriptions. Three of the top five products in both rankings were found to be combined corticosteroid/ β 2-agonist preparations (Seretide[®], Symbicort[®] and Fostair[®]) and the remaining two products contained the corticosteroid beclometasone (Clenil Modulite[®] and Qvar[®]) (Figure 11).

For the third year in a row⁵, Seretide[®] was identified as the product on which the highest total NIC was spent (Figure 11) while Clenil Modulite[®] was the product for which the highest quantity of units were prescribed (Figure 12). Notably, despite protecting its position as the market leader, both the total NIC spent on prescriptions for Seretide[®] (Figure 11) and the total quantity prescribed (Figure 12) were found to have steadily decreased between 2013 (total NIC £182.3 million, total quantity prescribed 4.4 million) and 2015 (total NIC £164.3 million, total quantity prescribed 4.1 million). This could be due to the introduction of cheaper generic versions of Seretide[®] in the UK⁶, which may present an attractive option when prescribing inhalers to new patients who do not already have familiarity with, or reference for, a specific inhaler brand.

Meanwhile, Symbicort[®], the second-highest ranked product in 2015, had increased both the quantity of units prescribed and the associated total NIC relative to 2013 and 2014. This increase was in spite of the introduction in 2014 of the generic version DuoResp[®], which has been recognised as a cheaper alternative to the originator product²².

Figure 11. Branded respiratory corticosteroids with the highest total NIC

- 2015
- 2014
- 2013

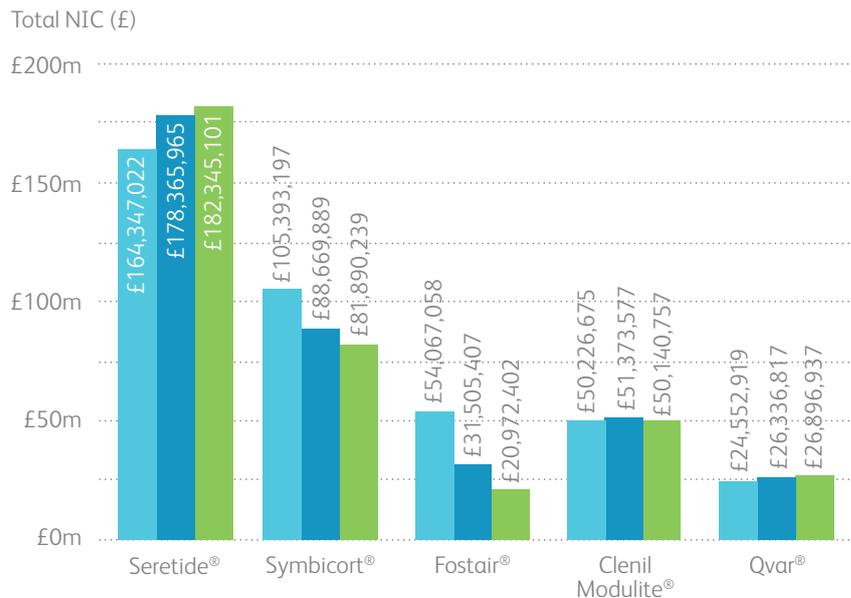
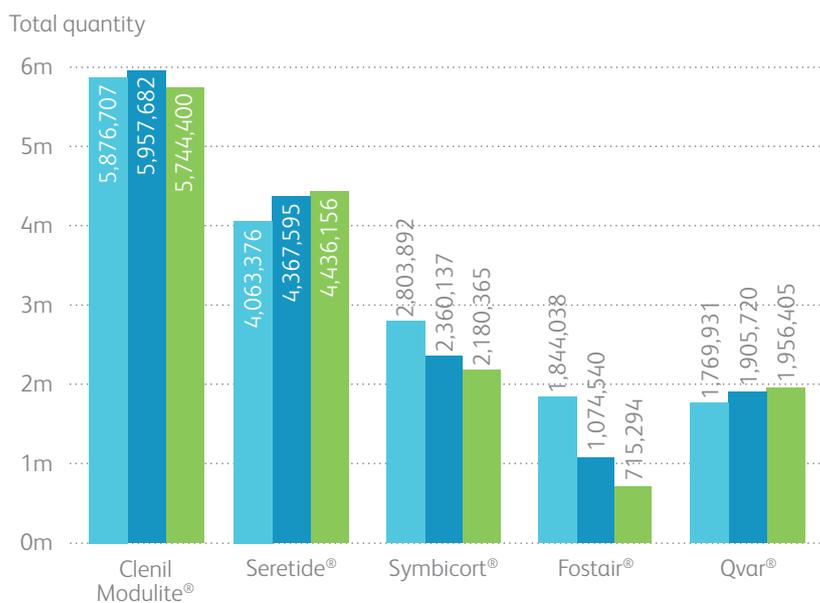


Figure 12. Branded respiratory corticosteroids with the highest quantities prescribed

- 2015
- 2014
- 2013



Analgesics

BNF categorises analgesics into four subcategories: antimigraine drugs, opioid analgesics, non-opioid analgesics & compound analgesics preparations and analgesics for neuropathic & functional pain²³. While NICE has not issued clinical guidelines for all the forms of pain for which these drugs are prescribed, there are guidelines available for migraines²⁴ and neuropathic pain²⁵.

Migraines are recommended to be managed using both acute treatments (either a combination therapy with either an oral triptan and a non-steroidal anti-inflammatory drug (NSAID) or an oral triptan and paracetamol, or a monotherapy with an oral triptan, NSAID, aspirin or paracetamol) and prophylactic treatments (topiramate, propranolol or amitriptyline depending on patient preference, comorbidities and risk of adverse events) for pharmacological treatment of migraine sufferers²⁴. Meanwhile, patients with neuropathic pain are to be offered amitriptyline, duloxetine, gabapentin or pregabalin (for further information on pregabalin, see 'Focus on Lyrica® prescribing' insert in the Antiepileptics section) as a first-line treatment²⁵.

When treating conditions requiring analgesics that are not covered by available NICE guidelines, many CCGs base analgesic prescribing guidance on the World Health Organization (WHO) pain relief ladder, which was originally developed to guide pain relief in cancer sufferers²⁶⁻²⁸. The ladder recommends that initial treatment should comprise of non-opioids such as aspirin and paracetamol and that prescribers should only progress to using opioids if the pain persists or increases²⁶. When opioids are required, the first choice should be a weak opioid with strong opioids only considered for patients whose pain persists or increases despite treatment with weak opioids²⁶.

Prescription trends

Macro trends

In 2015, the total NIC associated with prescriptions for analgesics issued in English and Welsh general practices, amounted to £621 million. This represented an increase of 6% from 2014 (Figure 13)⁵. The vast majority (89%) of analgesics tablets and capsules dispensed were prescribed per their active ingredient, without a branded product named on the prescription. These generic prescriptions corresponded to 78% of the total NIC associated with analgesics prescriptions in 2015. A similar trend was observed in 2014, when 90% of all units prescribed, accounting for 79% of associated total NIC, were issued by active ingredient.

The region with the largest proportion of the total NIC associated with analgesics prescriptions in 2015 was the North of England (33% of total NIC). Conversely, London had the lowest share of the total NIC for analgesics (8% of total NIC) (Figure 13). This ranking changed slightly when measuring the NIC per registered patient. While the North of England was the second-highest spender according to this measurement (£12.90), the highest NIC per registered patient was observed in Wales (£18.39). London, however, continued being the region with the lowest spend at only £5.07 per registered patient. These regional differences in the NIC per registered patient may be, in part, related to the levels of generic prescribing. In London, generic analgesics were prescribed in 96% of cases compared with 81% in Wales (Figure 14).

Figure 13. Regional distribution of total NIC for analgesic prescriptions

- North
- Midlands and East
- South
- London
- Wales

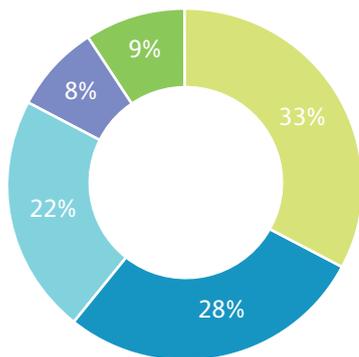
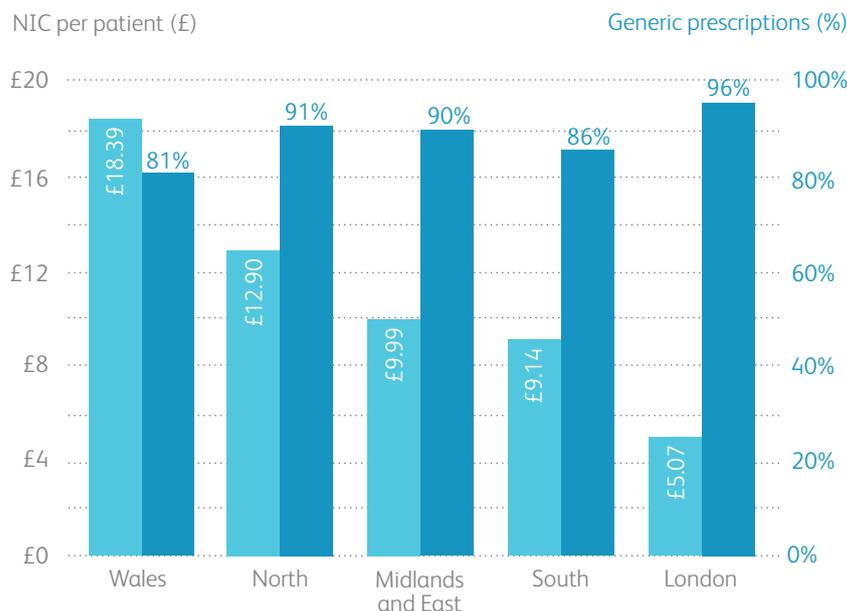


Figure 14. NIC per registered patient for analgesics prescriptions and percentage of all units prescribed generically

- NIC per registered patient
- Quantity prescribed generically



Segmenting the data by analgesics subcategories revealed that the highest total NIC in 2015 was associated with prescriptions for opioid analgesics (53% of total NIC), followed by non-opioid analgesics and compound analgesics (36% of total NIC), anti-migraine drugs (8% of total NIC) and, lastly, products for neuropathic pain (3% of total NIC). Based on these findings, we performed an additional analysis, solely focussing on opioid analgesics.

Over half (58%) of all opioid tablets and capsules prescribed in 2015 were identified as weak opioids; the highest quantity of prescribed units in 2015 were for the weak opioid tramadol (773 million units). However, while strong opioids as a group made up less than half of all units prescribed, the strong opioid morphine was identified as the opioid with the second-most units prescribed in 2015 (755 million units) (Figure 15).

Due to differences in the cost of individual products, a slightly different trend was observed when analysing the total NIC associated with opioid prescriptions. Then, prescriptions for weak opioids accounted for only a quarter (25%) of total NIC while the majority of total NIC was attributed to prescriptions for strong opioids, particularly buprenorphine, oxycodone and fentanyl, each of which had an associated total NIC of between £59 million and £67 million (Figure 16).

Figure 15. Total NIC for opioid analgesic prescriptions by opioid type*

- Strong opioid
- Weak opioid

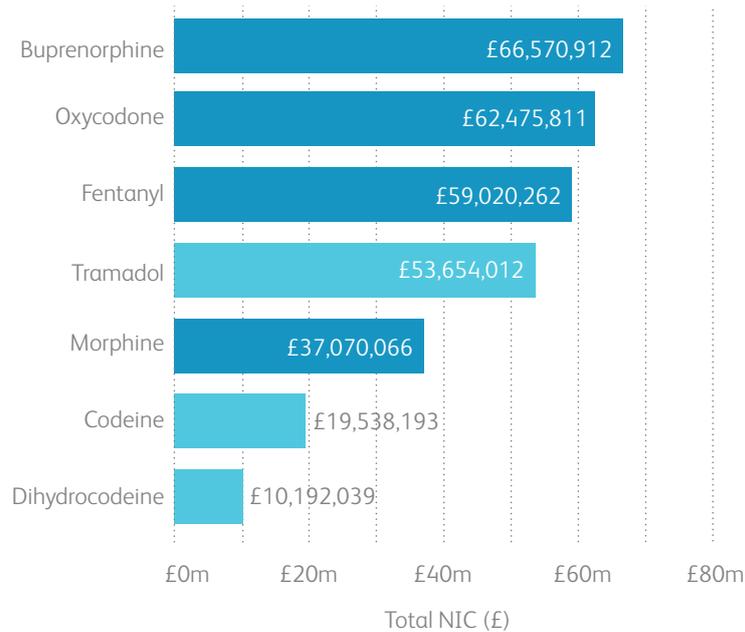
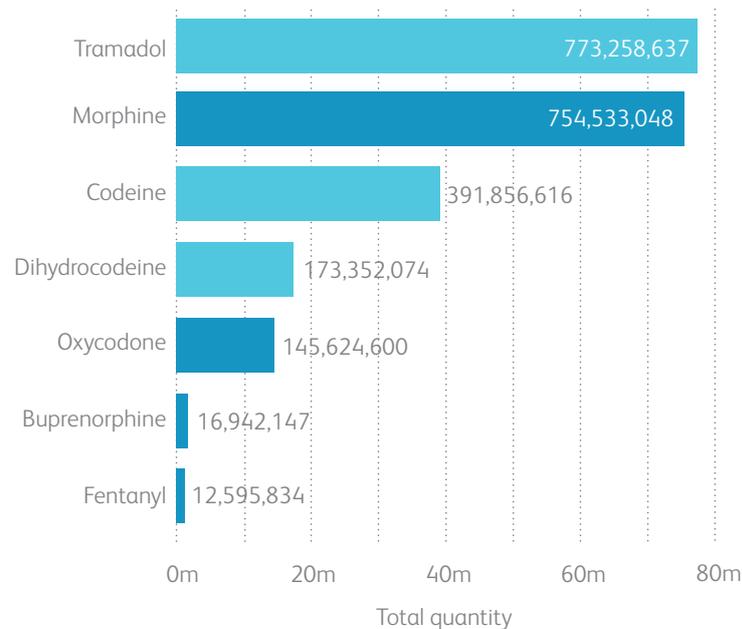


Figure 16. Total quantity prescribed by opioid type

- Strong opioid
- Weak opioid



* Only opioids that accounted for more than 2% of the total NIC associated with opioid analgesics are shown

Interestingly, a comparison between 2014 and 2015 showed a 3% increase in the quantity of opioid analgesics prescribed over the two years. Notably, the increase in quantity prescribed was much higher for strong (+10%) than weak (-2%) opioid analgesics. A similar trend was observed between 2013 and 2014(5), suggesting a continued and long-term trend towards increased use of strong opioids despite prescribing guidelines emphasising that they should be used as a last resort. While the reason for this trend is unclear, the OADA commented on the findings that an expectation that pain can be eradicated, rather than managed, could lead to patients expecting higher doses.

Brand trends

In 2015, the highest total NIC associated with analgesics prescriptions was for BuTrans® (buprenorphine; Figure 17). Conversely, Zapain® was identified as the branded analgesic for which the highest number of units were prescribed (Figure 18). Zapain® demonstrated a rapid growth, with the number of units prescribed increasing by 22% from 254 million in 2014 to 310 million in 2015.

“

The strong opioid increase could be patients still reporting pain when on the weaker analgesics and the doctors moving them up the pain ladder to stronger preparations but possibly not realising the addictive potential of these medicines ... Patient review is important and assessment of the risks from prescribing need to be done both initially and also regularly”

The Opioid Painkiller Dependence Alliance

Figure 17. Branded analgesics with the highest total NIC

- 2015
- 2014
- 2013

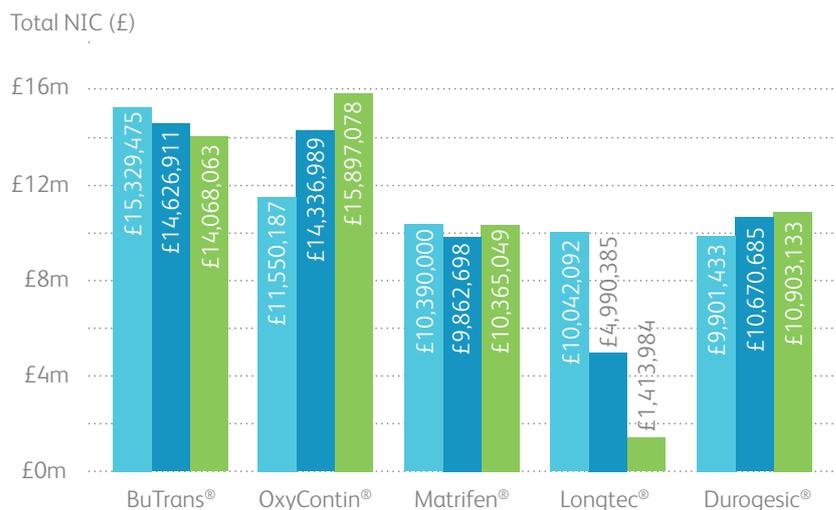
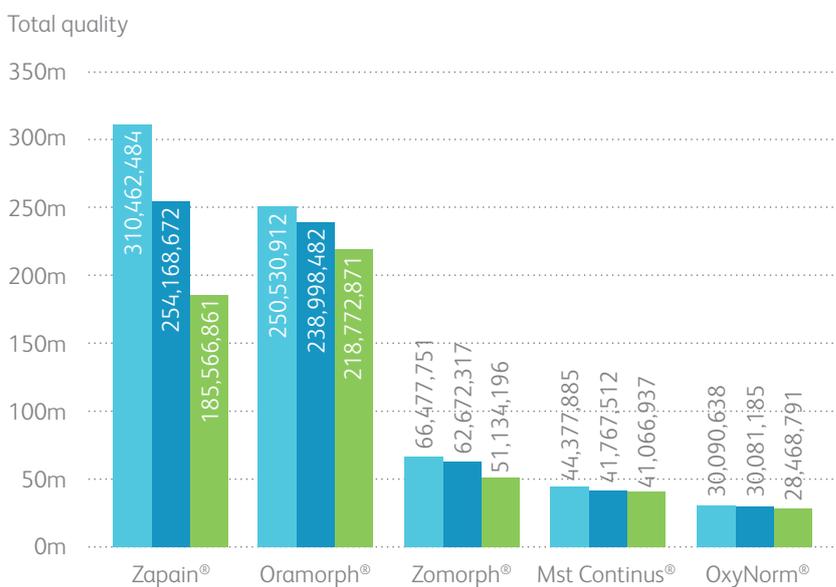


Figure 18. Branded analgesics with the highest quantities prescribed

- 2015
- 2014
- 2013



Antiepileptics

Epilepsy is a neurological disorder characterised by recurring seizures. In the UK, the prevalence of epilepsy is an estimated 5-10 cases per 1000 while the incidence is estimated to be 50 per 100,000 per year²⁹. NICE estimates that antiepileptic drugs offer satisfactory control of seizures in approximately two-thirds of patients with active epilepsy²⁹. However, variation in health services across the country has led to differing levels of success rates when treating epileptic seizures. For example, a House of Commons Committee of Public Accounts document reported that the proportion of epileptic patients who remained seizure-free for 21 months in 2013-2014 ranged from only 47% in Hull and North Manchester to almost 87% in South-West Lincolnshire³⁰. The inadequate healthcare offered in some regions does not only impact on patient well-being but also has economic consequences for the wider NHS, with an estimated £70 million spent on emergency admissions of epileptic patients³⁰.

Prescription trends

Macro trends

In 2015, the total NIC associated with prescriptions for antiepileptic drugs prescribed in English and Welsh general practices amounted to £536 million. Compared to 2014, this represented an 8% increase in both the quantities prescribed and associated total NIC.

The North of England was identified as the region with both the highest percentage of total NIC spend and the highest NIC per registered patient (33% of total NIC and £10.94 per registered patient) while Wales ranked at the bottom of both scales (3% of total NIC and £5.03 per registered patient) (Figures 19 and 20). Surprisingly, considering their low NIC per registered patient, Wales had lower levels of generic prescribing than other regions (72% of units). Meanwhile, the highest levels of generic prescribing were observed in London (81% of all prescriptions) (Figure 20).

Figure 19. Regional distribution of total NIC for antiepileptic prescriptions

- North
- Midlands and East
- South
- London
- Wales

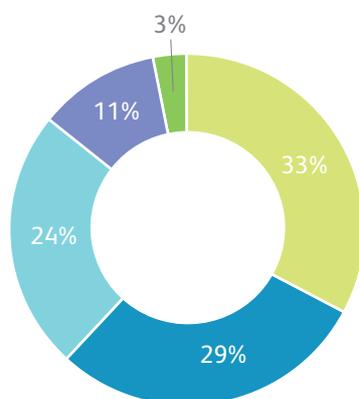
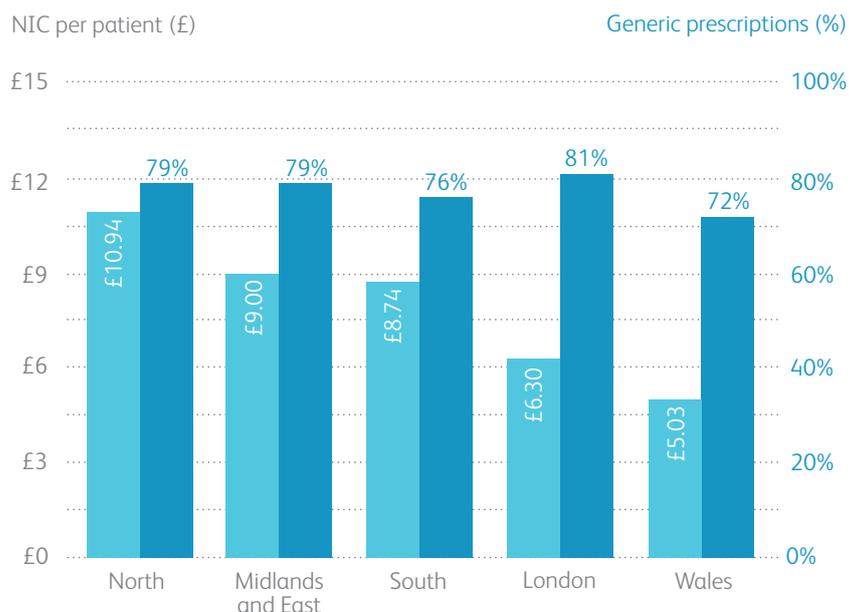


Figure 20. NIC per registered patient for antiepileptic prescriptions and percentage of all units prescribed generically

- NIC per registered patient
- Quantity prescribed generically



On a macro level, nearly four-fifths (78%) of all antiepileptic units prescribed in 2015, accounting for 74% of the total NIC, were prescribed generically rather than for a branded product. This represented a small decrease from 2014 when generic prescribing accounted for 80% of all units prescribed and 85% of the total NIC. However, while generic prescribing is typically encouraged in the NHS there is a medical argument for branded prescribing in the field of epilepsy and therefore it could be argued that the trend towards more generic prescribing is not a positive one. Specifically, it has been suggested that demonstrating bioequivalence for certain antiepileptic drugs with a narrow therapeutic window may not be sufficient to exclude the possibility of clinical non-equivalence to the originator drug³¹. To prevent potential harm arising from generic substitution of these antiepileptic drugs, the MHRA has therefore divided the available antiepileptic drugs into three categories, each with their own prescribing guidance (Table 5)³¹. It is recommended that patients taking drugs in category 1 are maintained on the particular product they were first prescribed, whether this is an originator drug or a branded generic. Prescriptions for drugs in category 2 may be issued generically according to the clinician’s judgement. Finally, prescriptions for drugs in category 3 may be issued generically unless there is special reason not to, such as patient anxiety or a risk of dosing error if different preparations are taken³¹. However, while the MHRA has recommended against generic prescribing of many antiepileptic drugs some medical charities believe the guidance should go even further in ensuring patients always receive the same version of a drug, whether this drug is a generic or branded originator product³².

Table 5. MHRA antiepileptic treatment categories

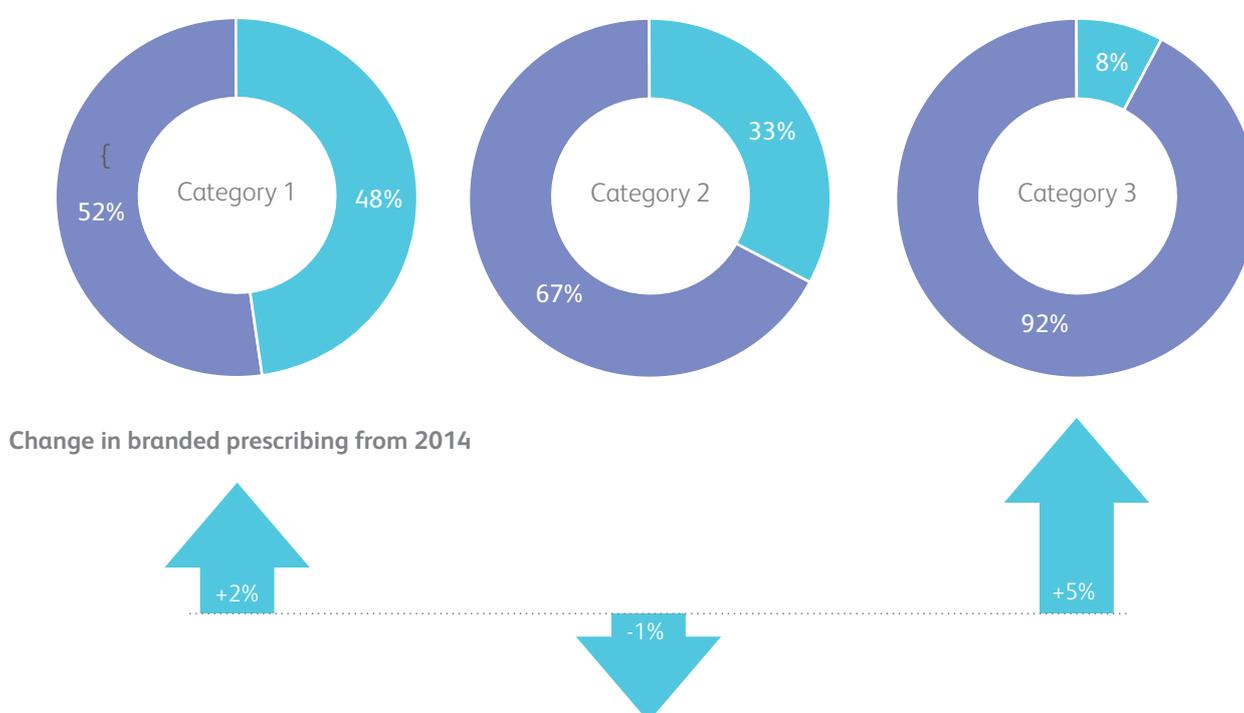
Category 1	Category 2	Category 3
Carbamazepine	Eslicarbazepine Acet	Ethosuximide
Phenobarb Sod	Clobazam	Gabapentin
Phenobarb	Clonazepam	Lacosamide
Primidone	Lamotrigine	Levetiracetam
	Oxcarbazepine	Pregabalin
	Perampanel	Tiagabine
	Retigabine	Vigabatrin
	Rufinamide	
	Topiramate	
	Valproic Acid	
	Zonisamide	
	Sod Valpr	

In line with MHRA guidance³¹ the proportion of drugs (when measuring the quantity of units prescribed) prescribed generically was highest for category 3 drugs (Figure 21). However, despite the MHRA stating that antiepileptic drugs in category 1 “need specific prescribing, supply and dispensing measures to ensure consistent supply of a particular product”³¹, over half (52%) of these prescriptions were issued generically in 2015 (Figure 21).

It was also noted that branded [currently generic] prescribing levels had changed from 2014. Branded prescribing had increased both for drugs falling into category 3 (+5% since 2014) and category 1 (+2% since 2014) while it had decreased for drugs in category 2 (-1%) (Figure 21).

Figure 21. Percentage of units in MHRA treatment categories 1, 2 and 3 that were prescribed by brand and generically

- Branded prescribing
- Generic prescribing



Brand trends

A separate analysis was conducted to identify the five branded antiepileptics for which the highest quantities were prescribed in 2015 as well as the five brands with the highest total NIC. The same branded products featured in both rankings, albeit with a slight difference in ranking order. The top ranking products included drugs from MHRA categories 1 (Tegretol[®]), 2 (Epilim[®] and Lamictal[®]) and 3 (Keppra[®] and Lyrica[®]).

The branded antiepileptic for which the most units were prescribed was Epilim[®] with approximately 200 million units prescribed in 2015 (Figure 22), accounting for a total NIC of over £24 million (Figure 23). This was in spite of a strengthened warning from the MHRA in January 2015, issued due to the risk of abnormal pregnancy outcomes associated with prescribing of Epilim[®]'s active ingredient, sodium valproate³³.

Epilim[®] was also ranked as the second-highest performing brand when analysing total NIC – only overtaken by Lyrica[®] for which nearly 55 million units were prescribed (Figure 22), accounting for a total NIC of over £62 million (Figure 23). However, while Lyrica[®] is categorised as an antiepileptic in the BNF, it is noted that the drug is also indicated for neuropathic pain and that much of its success in 2105 is likely due to increased prescriptions for neuropathic rather than epileptic patients (See 'Focus on Lyrica[®] prescribing' box).

Figure 22. Branded antiepileptics with the highest total NIC

- 2015
- 2014
- 2013

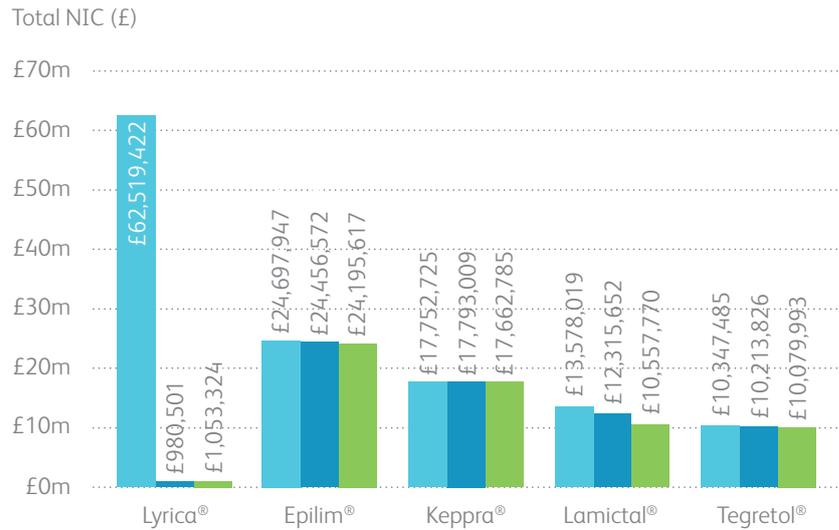
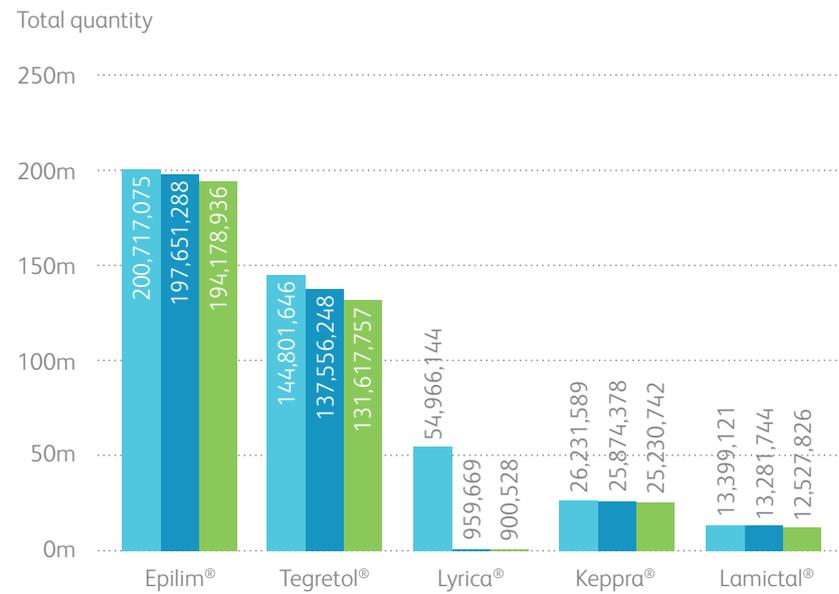


Figure 23. Branded antiepileptics with the highest quantities prescribed

- 2015
- 2014
- 2013



Focus on Lyrica® prescribing

Lyrica® (pregabalin) is indicated for neuropathic pain, epilepsy and generalised anxiety disorder⁷. In 2015 Lyrica®'s patent for epilepsy and generalised anxiety disorder, but not for neuropathic pain, expired³⁴. Following a high-court challenge by the manufacturer of Lyrica® against several generic manufacturers, NHS England issued a prescribing guidance to GPs in March 2015, stating that all prescriptions of pregabalin for the treatment of neuropathic pain should be made under the brand name Lyrica®, except in cases of clinical contraindications or special needs³⁵.

Oral nutrition

The BNF 'Oral nutrition' section, which this chapter focusses on, includes both foods for special diets and enteral nutrition products. Special diet foods contain alternatives to constituents that some individuals are intolerant to, such as gluten, while enteral nutrition products are given to patients who, for various reasons, cannot feed normally^{36,37}.

Food intolerances are common in the UK. Approximately 20% of adults reported having a food intolerance in a UK household survey in 1994³⁸ and 13% of English respondents self-reported gluten sensitivity in 2012³⁹. Treatment primarily focusses on changing the patient's diet to avoid the constituent to which the patient is intolerant, e.g. by replacing normal bread with gluten-free bread. However, as reported in our 2014 prescribing review⁵, some CCGs have restricted prescriptions, especially for gluten-free goods, due to budgetary pressures⁴⁰, which could in theory make it difficult for people on low income to avoid the food constituents they are intolerant to while maintaining a balanced and nutritious diet. The British Dietetic Association has therefore emphasised the importance of CCGs ensuring that coeliac patients can receive staple gluten-free foods on prescription⁴¹.

Malnutrition, for which enteral products are used, is defined as a body mass index (BMI) of less than 18.5kg/m², unintentional weight loss of over 10% within 3-6 months or a BMI under 20kg/m² and unintentional weight loss over 5% within 3-6 months⁴². Malnutrition affects approximately 5% of the adult population in England⁴³. The expenditure associated with malnourishment accounts for over 15% of public spending on health and social care⁴³ and a recent report by BAPEN indicated that the annual total healthcare cost of treating a malnourished individual is £7,408 annually, three times that of treating a person who was not malnourished (£2,155 per year)⁴³.

Prescription trends

Macro trends

In 2015, the total NIC associated with prescriptions for oral nutrition products issued in English and Welsh general practices amounted to £397 million (Figure 3). Relative to 2014, the quantity prescribed had increased by 2% while the total NIC associated with these prescriptions increased by 4%.

As in the previous year⁵, the highest proportion of the total NIC was associated with prescriptions issued in the North (31% of total spend) and in the Midlands and East England (30% of total NIC) (Figure 24). Wales was responsible for the lowest proportion of the total NIC (6% of total NIC) (Figure 24) but did have the highest NIC per registered patient (£7.79) (Figure 25). Meanwhile, the lowest relative NIC was found in London (£5.32 per registered patient).

Figure 24. Regional distribution of total NIC for oral nutrition prescriptions

- North
- Midlands and East
- South
- London
- Wales

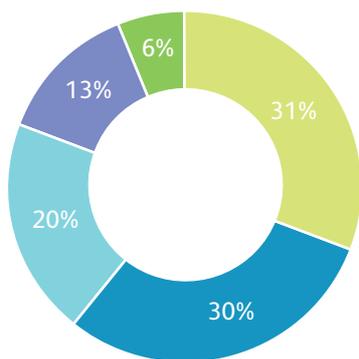
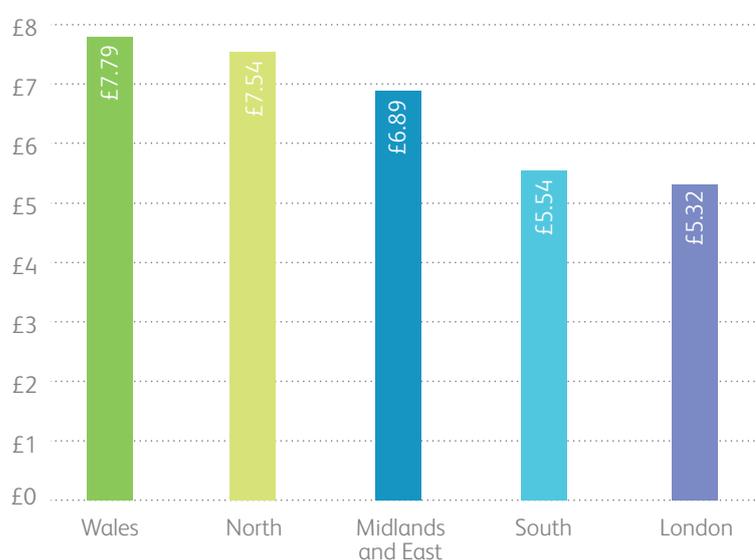


Figure 25. NIC per registered patient for oral nutrition prescriptions

NIC per patient (£)



Product category trends

As in 2014⁵, the majority of all units prescribed in 2015, and associated total NIC, was attributed to prescriptions for enteral products (77% units prescribed and 67% of total NIC) (Figures 26 and 27). For the second year in a row, the largest percentage increase in total NIC was observed for the 'Other food for special diet preparations' category which includes nutritional supplements and paediatric milk intolerance (13% increase in total NIC). Meanwhile, the total NIC associated with prescriptions for products in the 'specific food intolerances' category, which includes gluten-/wheat-free products, low protein products, and products that are both gluten-/wheat-free and low protein, decreased by 4% relative to 2014.

Figure 26. Total NIC for prescriptions for different types of oral nutrition products

● 2015
● 2014
● 2013

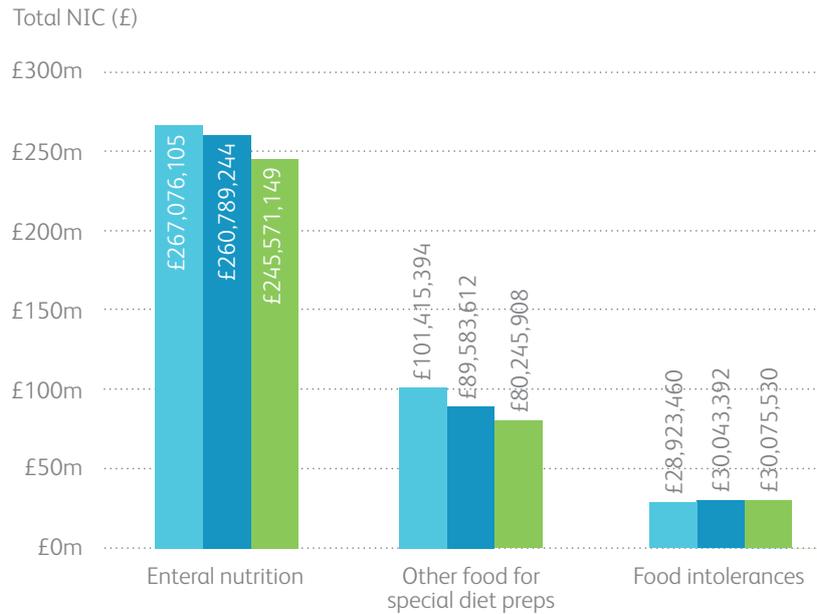
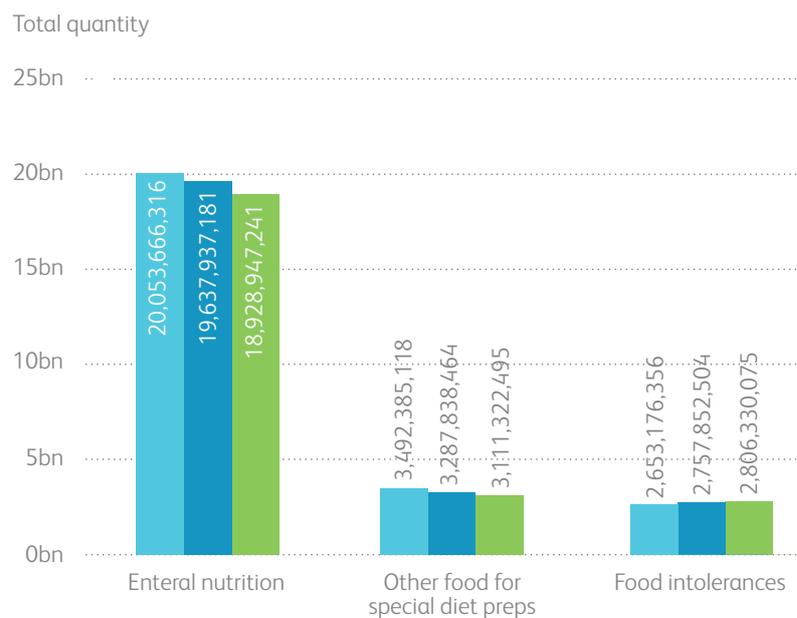


Figure 27. Quantities prescribed for different types of oral nutrition products

● 2015
● 2014
● 2013



Brand trends

The branded oral nutrition products with the highest total NIC associated to their prescriptions in 2015 were predominantly energy supplement drinks (Figure 28), which are prescribed for patients suffering from, or at risk of, malnutrition. The exception was first-placed Neocate[®] LCP, which is indicated for infants in their first year who have an allergy to cow's milk, a multiple food protein intolerance or other condition where an amino acid based formula is recommended. Neocate[®] LCP continued to experience a strong increase in prescription spending, gaining 23% in 2015 compared with 2014. Overall, Nutricia products continued to dominate the market, with their Fortisip Bottle[®], Fortisip Compact[®] and Fortijuice[®] taking the second, fourth and fifth top-ranked by total NIC in 2015.

When ranking products according to their quantities prescribed, the top-ranking product was Ensure[®] Plus[®] milkshake-style drink (Figure 29), with 2.5 billion units prescribed in 2015. However, despite its high performance, this actually represented a 7% decrease relative to 2014. Instead, the only products in the top five to experience a growth in the quantities prescribed were Nutricia's Fortisip Compact[®] and Fortijuice[®].

Figure 28. Branded oral nutrition products with the highest total NIC

- 2015
- 2014
- 2013

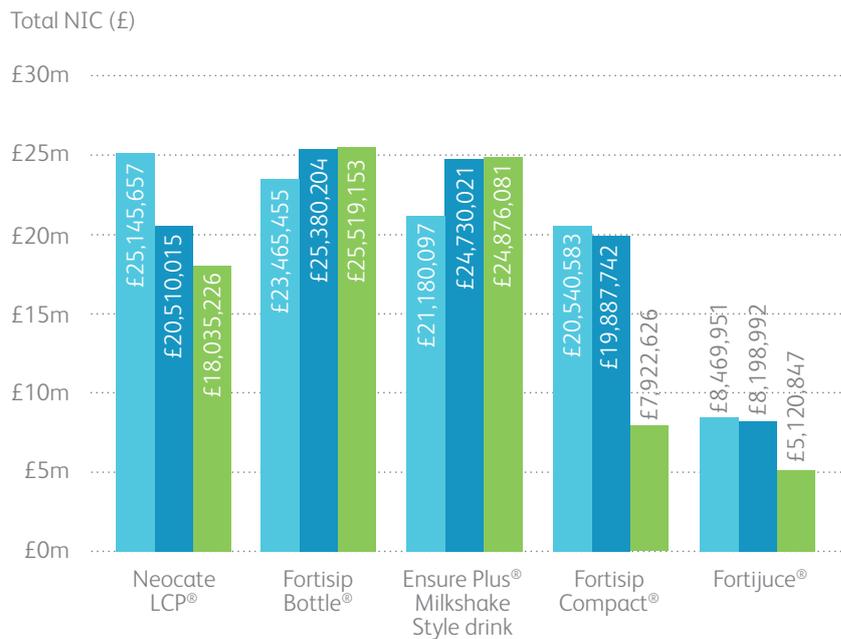
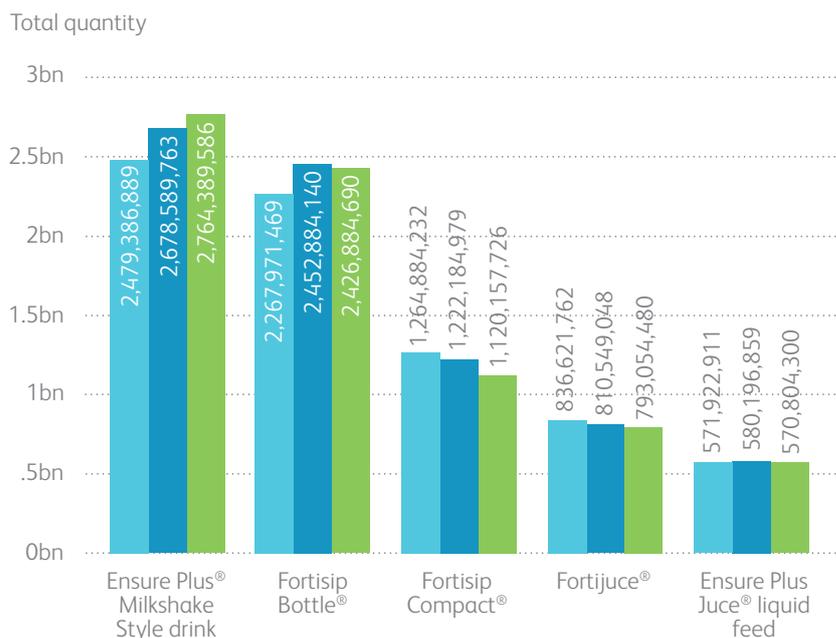


Figure 29. Branded oral nutrition products with the highest quantities prescribed

- 2015
- 2014
- 2013



References

1. Health and Social Care Information Centre. Numbers of Patients Registered at a GP Practice - January 2015 [Internet]. 2015 [cited 2015 Jan 16]. Available from: <http://www.hscic.gov.uk/article/2021/Website-Search?productid=16843&q=Numbers+of+Patients+Registered+at+a+GP+Practice&sort=Relevance&size=10&page=1&area=both#top>
2. National Health Service Wales Informatics Service. Welsh GP practice registrations. 2015.
3. National Health Service England. NHS England CCG tools [Internet]. 2016. Available from: <http://ccgtools.england.nhs.uk/ccgoutcomes/html/atlas.html>
4. Health and Social Care Information Centre. Primary Care [Internet]. 2015 [cited 2016 Nov 4]. Available from: <http://www.hscic.gov.uk/primary-care>
5. Murphy E, Spain V. General Practice Prescribing Trends in England and Wales 2014 Annual Review. Cogora; 2015.
6. Mylan Launches First Bioequivalent Alternative to Combination Asthma Therapy Seretide® Evohaler® (Salmeterol Xinafoate/Fluticasone Propionate) Under the Brand Name Sirdupla™ in the UK [Internet]. Mylan.co.uk. 2015. Available from: <http://www.mylan.co.uk/en-gb/news/2014/mylan-launches-first-bioequivalent-alternative>
7. European Medicines Agency. Lyrica: EPAR - Product Information [Internet]. 2016. Available from: http://www.ema.europa.eu/docs/en_GB/document_library/EPAR_-_Product_Information/human/000546/WC500046602.pdf
8. Warner-Lambert v NHS England [Internet]. 2015 [cited 2016 Nov 4]. Available from: <https://www.england.nhs.uk/wp-content/uploads/2015/03/Judgment.pdf>
9. National Institute for Health and Care Excellence. NICE advice ESNM47 [Internet]. 2014 [cited 2015 Apr 7]. Available from: <https://www.nice.org.uk/advice/esnm47#product-overview>
10. European Medicines Agency. Incruse: EPAR - Product Information [Internet]. 2015 [cited 2016 Nov 4]. Available from: http://www.ema.europa.eu/docs/en_GB/document_library/EPAR_-_Product_Information/human/002809/WC500167430.pdf
11. UK Medicines Information. New Drugs Online Report for umeclidinium [Internet]. 2014 Feb [cited 2016 Nov 4]. Available from: http://www.ukmi.nhs.uk/applications/ndo/record_view_open.asp?newDrugID=5399
12. All Wales Medicines Strategy Group. Final Appraisal Recommendation – 3514: Umeclidinium (Incruse®) 55 micrograms inhalation powder. [Internet]. 2014 [cited 2016 Nov 4]. Available from: <http://www.awmsg.org/awmsgonline/app/appraisalinfo/1352>
13. National Institute for Health and Care Excellence. Clinical Guideline 15. Type 1 diabetes: Diagnosis and management of Type 1 diabetes in children, young adults and adults. London: National Institute for Health and Care Excellence; 2004.
14. National Institute for Health and Care Excellence. Clinical Guideline 87. Type 2 diabetes, the management of type 2 diabetes. London: National Institute for Health and Care Excellence; 2014.
15. Health and Social Care Information Centre. Quality and Outcomes Framework – prevalence, achievement and exceptions report. 2014 Oct.
16. Health and Social Care Information Centre. Hospital Episode Statistics, Admitted Patient Care - England, 2014-15 [NS] [Internet]. 2015 Nov [cited 2016 Nov 4]. Available from: <http://www.hscic.gov.uk/searchcatalogue?productid=19420&q=title%3a%22Hospital+Episode+Statistics%2c+Admitted+patient+care+-+England%22&sort=Relevance&size=10&page=1#top>
17. MIMS. Corticosteroids [Internet]. [cited 2015 Feb 2]. Available from: <http://www.mims.co.uk/search/Drugs/phrase/corticosteroids/field/drugs/sortby/therapeutic%20area/resultsPerPage/50/>
18. SIGN, Healthcare Improvement Scotland. Guideline 101. British guideline on the management of asthma. 2008 revised 2012.
19. National Institute for Health and Care Excellence. Clinical Guideline 101. Chronic obstructive pulmonary disease. Management of chronic obstructive pulmonary disease in adults in primary and secondary care (partial update). London: National Institute for Health and Care Excellence.; 2010.
20. Health and Social Care Information Centre. Health Survey for England - 2010, Respiratory health: Chapter 2, Respiratory symptoms and disease in adults. 2010.
21. Dhanji S, Prigmore S, Rabheru-Doddy R. Medicines Management of Asthma Guidelines for Primary Care [Internet]. Wandsworth Clinical Commissioning Group; 2015. Available from: <http://www.wandsworthccg.nhs.uk/aboutus/Prescribing%20Guidelines%20v20/Asthma%20Medicines%20Management%20Guidelines%20December%202015.pdf>
22. Dorset Medicines Advisory Group. Commissioning Statement for Duoresp® Piromax® (Budesonide and Formoterol Fumarate Dehydrate) Inhalation Powder for Asthma or COPD [Internet]. 2016. Available from: <http://www.dorsetccg.nhs.uk/Downloads/aboutus/medicines-management/Other%20Guidelines/Commissioning%20Statement%20Duoresp%20Spiromax.pdf>
23. Joint Formulary Committee. British National Formulary, 4.7 Analgesics. London: BMJ Group and Pharmaceutical Press; 2014 Nov.
24. National Institute for Health and Care Excellence. Clinical Guideline 150. Headaches in over 12s: diagnosis and management. London: National Institute for Health and Care Excellence; 2012.
25. National Institute for Health and Care Excellence. Clinical guideline 173. Neuropathic pain in adults:

- pharmacological management in non-specialist settings. London: National Institute for Health and Care Excellence; 2013.
26. World Health Organisation. WHO's cancer pain ladder for adults [Internet]. 2016 [cited 2015 Jan 23]. Available from: <http://www.who.int/cancer/palliative/painladder/en/>
 27. Barking and Dagenham CCG. Treatment algorithm for non palliative pain in adults - primary care [Internet]. 2013 [cited 2015 Mar 13]. Available from: <http://www.barkingdagenhamccg.nhs.uk/downloads/For-health-professionals/Medicines-management/Guidance/BHR%20pain%20management%20guidelines%20July%202013.pdf>
 28. Tameside & Glossop Health Services. Palliative care pain & symptom control guidelines, 3rd edition. 2013 Oct.
 29. National Institute for Health and Care Excellence. Clinical Guideline 137. Epilepsies: diagnosis and management. London: National Institute for Health and Care Excellence; 2016 Feb.
 30. House of Commons. Services to people with neurological conditions: progress review [Internet]. 2016 Feb. Report No.: 24. Available from: <http://www.publications.parliament.uk/pa/cm201516/cmselect/cmpubacc/502/502.pdf>
 31. Medicine and Healthcare products Regulatory Agency. Formulation switching of antiepileptic drugs. A Report on the Recommendations of the Commission on Human Medicines from July 2013. 2013 Jul.
 32. Epilepsy Society. MHRA guidance on anti-epileptic drugs [Internet]. 2013. Available from: https://www.epilepsysociety.org.uk/mhra-guidance-anti-epileptic-drugs#.VwfjZ_krKM9
 33. Medicines and Healthcare products Regulatory Agency. Medicines related to valproate: risk of abnormal pregnancy outcomes [Internet]. gov.uk; 2015. Available from: <https://www.gov.uk/drug-safety-update/medicines-related-to-valproate-risk-of-abnormal-pregnancy-outcomes>
 34. Wise J. Doctors are warned not to prescribe generic pregabalin for pain control. *Br Med J*. 2015;350(h1724).
 35. National Health Service England. Schedule 1: The Pregabalin Guidance [Internet]. 2015 [cited 2016 Nov 4]. Available from: <http://psnc.org.uk/sunderland-lpc/our-news/pregabalin-lyrica-urgent-update/>
 36. Joint Formulary Committee. British National Formulary, 9.4.1 Foods for special diets. London: BMJ Group and Pharmaceutical Press;
 37. Joint Formulary Committee. 9.4.2 Enteral nutrition. London: BMJ Group and Pharmaceutical Press;
 38. Young E, Stoneham M., Petrukevitch A, Barton J, Rona R. A population study of food intolerance. *The Lancet*. 1994;343(8906):1127–30.
 39. Aziz I, Lewis N, Hadjivassiliou M, Winfield S, Kelsall A, Rugg N, et al. A UK study assessing the population prevalence of self-reported gluten sensitivity and referral characteristics to secondary care. *Eur J Gastroenterol Hepatol*. 2014;26(1):33–9.
 40. Opinion Leader. The impact of the restrictions to gluten-free prescription foods on people with Coeliac Disease. Report of findings. 2013.
 41. The British Dietetic Association. Policy Statement: Gluten Free Food on Prescription [Internet]. The British Dietetic Association; 2015. Available from: https://www.bda.uk.com/improvinghealth/healthprofessionals/policy_statement_gluten_free_food_on_prescription
 42. National Institute for Health and Care Excellence. Nutrition support for adults: oral nutrition support, enteral tube feeding and parenteral nutrition [Internet]. National Institute for Health and Care Excellence; 2006. Available from: <https://www.nice.org.uk/guidance/cg32>
 43. Marinos E. The cost of malnutrition in England and potential cost savings from nutritional interventions (full report) [Internet]. Malnutrition Action Group of BAPEN and the National Institute for Health Research Southampton Biomedical Research Centre; 2015 Nov. Available from: <http://www.bapen.org.uk/pdfs/economic-report-short.pdf>
 44. Health and Social Care Information Centre. Report 1: Care Processes and Treatment Targets. 2016 Jan. (National Diabetes Audit 2013-2014 and 2014-2015). Report No.: 1.
 45. UK Medicines Information. New Drugs Online Report for insulin glargine biosimilar (LY2963016 [Internet]. Available from: http://www.ukmi.nhs.uk/applications/ndo/record_view_open.asp?newDrugID=5484
 46. Competition and Markets Authority. CMA issues statement of objections to Pfizer and Flynn Pharma in anti-epilepsy drug investigation [Internet]. gov.uk; 2015. Available from: <https://www.gov.uk/government/news/cma-issues-statement-of-objections-to-pfizer-and-flynn-pharma-in-anti-epilepsy-drug-investigation>
 47. National Health Service. Food allergy or food intolerance? [Internet]. NHS Choices. 2016. Available from: <http://www.nhs.uk/Livewell/Allergies/Pages/Foodallergy.aspx>
 48. Barking and Dagenham, Havering and Redbridge Clinical Commissioning Groups. Treatment Algorithm for Non Palliative Pain in Adults – Primary Care [Internet]. 2015. Available from: <http://www.barkingdagenhamccg.nhs.uk/downloads/For-health-professionals/Medicines-management/Guidance/BHR%20pain%20management%20guidelines%20July%202013.pdf>
 49. Asomaning K, Abramsky S, Liu Q, Zhou X, Sobel R, Watt S. Pregabalin prescriptions in the United Kingdom: a drug utilisation study of The Health Improvement Network (THIN) primary care database. *Int J Clin Pract*. 2016 Mar 29;
 50. European Medicines Agency. Briavact: EPAR - Product Information [Internet]. 2016. Available from: http://www.ema.europa.eu/docs/en_GB/document_library/EPAR_-_Product_Information/human/003898/WC500200206.pdf
 51. European Medicines Agency. CHMP assessment report: DuoResp Spiromax [Internet]. 2014 Feb. Available from: http://www.ema.europa.eu/docs/en_GB/document_library/EPAR_-_Public_assessment_report/human/002348/WC500167183.pdf

Appendix

Grouping of products into different therapy areas was done based on the BNF section they fell into. Data were thereafter further segmented according to BNF paragraph and subparagraph, which provide information on the drug class a product belongs to. An overview of the BNF sections, paragraphs and subparagraphs that products included in the report's data analysis fell into are provided in the tables below. The tables also show the specific products (by chemical name) that were included in the analysis.

Table 6. Products included in the BNF Diabetes section (section 0601)

Paragraph	Subparagraph	Chemical
Insulin	Short-Acting Insulins	Insulin Aspart, Acid Insulin Injection, Insulin Lispro, Soluble Insulin (Neutral Insulin), Insulin Glulisine, Insulin Human Inhaled, Insulin Human
	Intermediate And Long-Acting Insulins	Biphasic Insulin Injection, Biphasic Isophane Insulin, Biphasic Insulin Lispro, Insulin Zinc Suspension, Insulin Zinc Suspension (Amorphous), Insulin Zinc Suspension (Crystalline), Isophane Insulin, Protamine Zinc Insulin, Insulin Glargine, Biphasic Insulin Aspart, Insulin Detemir, Insulin Degludec, Other Intermed&Long-Acting Insulin Preps
Antidiabetic Drugs	Sulfonylureas	Glimepiride, Acetohexamide, Chlorpropamide, Glibenclamide, Glibornuride, Gliclazide, Glipizide, Gliquidone, Glymidine, Tolazamide, Tolbutamide
	Biguanides	Metformin Hydrochloride, Phenformin Hydrochloride
	Other Antidiabetic Drugs	Vildagliptin, Liraglutide, Saxagliptin, Metformin Hydrochloride/Sitagliptin, Linagliptin, Linagliptin/Metformin, Dapagliflozin, Saxagliptin/Metformin, Lixisenatide, Alogliptin/Metformin, Alogliptin, Dapagliflozin/Metformin, Canagliflozin, Empagliflozin, Acarbose, Pioglitazone Hydrochloride, Guar Gum, Miglitol, Repaglinide, Rosiglitazone, Troglitazone, Nateglinide, Metformin Hydrochloride/Rosiglitazone, Metformin Hydrochloride/Pioglitazone, Sitagliptin, Exenatide, Metformin Hydrochloride/Vildagliptin
Treatment Of Hypoglycaemia	Treatment Of Hypoglycaemia	Diazoxide, Glucagon, Glucose
Diabetic Nephropathy & Neuropathy	Diabetic Nephropathy & Neuropathy	Tolrestat
Diabetic Diagnostic & Monitoring Agents	Diabetic Diagnostic & Monitoring Agents	Glucose Blood Testing Reagents, Urine Testing Reagents, Ketone Blood Testing Reagents, Other Screening & Monitoring Agent Preps

Table 7. Products included in the BNF Respiratory Corticosteroids section (section 0302)

Paragraph	Subparagraph	Chemical
Corticosteroids (Respiratory)	Corticosteroids (Respiratory)	Beclometasone Dipropionate, Betamethasone Valerate, Budesonide, Fluticasone Propionate (Inh), Mometasone Furoate, Triamcinolone Acetonide, Ciclesonide

Table 8. Products included in the BNF Analgesics section (section 0407)

Paragraph	Subparagraph	Chemical
Non-Opioid Analgesics And Compound Prep	Non-Opioid Analgesics And Compound Prep	Aspirin & Caffeine, Paracetamol & Phenylephrine HCl, Isometheptene Mucate, Paracetamol & Ibuprofen, Aspirin & Papaveretum, Aspirin, Dipyrone Sodium, Co-Codamol (Codeine Phos/Paracetamol), Paracetamol, Phenazone, Phenol, Co-Codaprin (Codeine Phos/Aspirin), Co-Dydramol (Dihydrocodeine/Paracet), Nefopam Hydrochloride, Co-Proxamol (Dextroprop HCl/Paracet), Aspirin, Phenacetin & Codeine (Codeine Co), Aspirin & Paracetamol, Aspirin, Paracetamol & Codeine, Paracetamol & Caffeine, Paracetamol & Codeine Phosphate, Aspirin Combined Preparations, Paracetamol Combined Preparations, Aloxiprin, Other Non-Opioid Analgesic Preps, Lysine Aspirin, Co-Methiamol (Methionine/Paracetamol)
Opioid Analgesics	Opioid Analgesics	Butorphanol Tartrate, Papaveretum, Phenoperidine Hydrochloride, Oxycodone Hydrochloride, Diamorphine Hydrochloride (Top), Oxycodone HCl/Naloxone HCl, Tapentadol Hydrochloride, Fentanyl, Buprenorphine, Codeine Phosphate, Dextromoramide Tartrate, Dextropropoxyphene, Dihydrocodeine Tartrate, Dipipanone Hydrochloride, Levorphanol Tartrate, Diamorphine Hydrochloride (Systemic), Meptazinol Hydrochloride, Methadone Hydrochloride, Morphine, Morphine Hydrochloride, Morphine Sulfate, Pentazocine Hydrochloride, Pentazocine Lactate, Pethidine Hydrochloride, Powdered Opium, Phenazocine Hydrobromide, Nalbuphine Hydrochloride, Oxycodone, Morphine Anhydrous, Morphine Tartrate & Cyclizine Tartrate, Tramadol Hydrochloride, Hydromorphone Hydrochloride
Neuropathic Pain	Neuropathic Pain	Gabapentin (Neuropathic Pain)

Table 8 cont. Products included in the BNF Analgesics section (section 0407)

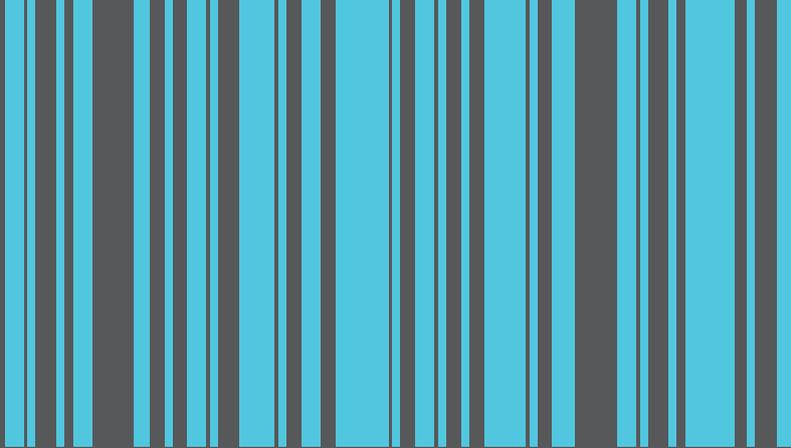
Paragraph	Subparagraph	Chemical
Antimigraine Drugs	Treatment Of Acute Migraine	Eletriptan, Frovatriptan, Analgesics with Anti-Emetics, Almotriptan, Dihydroergotamine Mesilate, Ergotamine Tartrate, Naratriptan Hydrochloride, Rizatriptan, Sumatriptan Succinate, Tolfenamic Acid, Zolmitriptan, Other Treatment of Acute Migraine Preps
	Prophylaxis Of Migraine	Semisodium Valproate, Clonidine Hydrochloride, Methysergide, Pizotifen Malate, Other Prophylaxis of Migraine Preps

Table 9. Products included in the BNF Antiepileptics section (section 0408)

Paragraph	Subparagraph	Chemical
Control Of Epilepsy	Control Of Epilepsy	Felbamate, Tiagabine, Zonisamide, Pregabalin, Rufinamide, Stiripentol, Lacosamide, Eslicarbazepine Acetate, Retigabine, Perampanel, Levetiracetam, Beclamide, Carbamazepine, Oxcarbazepine, Clonazepam, Gabapentin, Lamotrigine, Ethosuximide, Mesuximide, Methylphenobarbital, Pheneturide, Phenobarbital, Phenobarbital Sod, Phenytoin Sodium, Mephenytoin, Phenobarbital & Phenytoin, Phensuximide, Primidone, Trimethadione, Sodium Valproate, Vigabatrin, Sultiame, Phenytoin, Valproic Acid, Barbexalone, Topiramate, Clobazam
Drugs Used In Status Epilepticus	Drugs Used In Status Epilepticus	Clonazepam, Paraldehyde, Phenytoin Sodium, Fosphenytoin Sodium, Midazolam Maleate, Midazolam Hydrochloride

Table 10. Products included in the BNF Oral Nutrition section (section 0904)

Paragraph	Subparagraph	Chemical
Foods For Special Diets	Foods For Special Diets	Gluten Free/Wheat Free Mixes, Gluten Free/Wheat Free Cooking Aids, Gluten Free/Wheat Free Cereals, Gluten Free/Wheat Free Cakes/Pastries, Gluten Free/Low Protein Cereals, Gluten Free/Low Protein Sweet/Savoury, Gluten Free/Wheat Free Meals, Gluten Free/Wheat Free/Low Protein Pasta, Gluten Free/Wheat Free/Low Protein Bisc,Gluten Free/Wheat Free/Low Protein Mixes/F /W/F /L/P Cooking Aids, Low Protein Meals, Low Protein Desserts, Low Protein Miscellaneous, Low Protein Cereals, Low Protein Pasta, Low Protein Cooking Aids, Low Protein Cakes, Low Protein Snacks, Gluten Free/Wheat Free Snacks, Wheat Free Cakes/Pastries, Gluten Free/Wheat Free Biscuits, Anhydrous Glucose, B-Galactosidase, Maize (Corn),Gluten Free/Low Protein Mixes, Gluten Free/Low Protein Bread, Fructose, Gluten Free Bread, Gluten Free Biscuits, Gluten Free Grains/Flours, Glucose, Gluten Free Cakes/Pastries, Gluten Free Cooking Aids, Gluten Free Cereals, Sunflower, Gluten Free Pasta, Diabetic, Gluten Free/Wheat Free Sweet/Savoury, Gluten Free/Low Protein Pasta, Gluten Free/Wheat Free Bread, Gluten Free/Low Protein Grains/Flours, Low Protein Biscuits, Low Protein Bread, Low Sodium Bread, Gluten Free/Low Protein Biscuits, Other Food For Special Diet Preps, Low Protein Mixes, Low Protein Grains/Flours, Gluten Free Mixes, Gluten Free/Low Protein Cakes/Pastries, Gluten Free/Low Protein Cooking Aids, Gluten Free/Low Protein Meals, Gluten Free/Wheat Free Grains/Flours, Gluten Free/Wheat Free Pasta, Maltodextrin
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