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Ziegler, L, Bennett, M [orcid.org/0000-0002-8369-8349](https://orcid.org/0000-0002-8369-8349), Mulvey, M [orcid.org/0000-0002-6357-3848](https://orcid.org/0000-0002-6357-3848) et al. (2 more authors) (2018) Characterising the growth in palliative care prescribing 2011–2015: Analysis of national medical and non-medical activity. *Palliative Medicine*, 32 (4). pp. 767-774. ISSN 0269-2163

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Title: Non medical prescribing in palliative care; analysis of national prescribing activity 2011-2015.

Authors :

Dr Lucy Ziegler, Senior Research Fellow <sup>1</sup>

Prof. Michael I Bennett, Professor of Palliative Medicine <sup>1</sup>

Dr Matt Mulvey, Research Fellow<sup>1</sup>

Dr Tim Hamilton, Research Fellow <sup>1</sup>

Prof. Alison Blenkinsopp <sup>2</sup>

1. Academic Unit of Palliative Care, Leeds Institute of Health Sciences, School of Medicine, University of Leeds, Leeds, UK

2. School of Pharmacy, University of Bradford, Bradford, UK

**Corresponding Author:** Dr Lucy Ziegler, Senior Research Fellow in Palliative Care  
Academic Unit of Palliative Care, Leeds Institute of Health Sciences  
School of Medicine, University of Leeds, LS2 9LJ  
Tel +44 0113 3437351 [l.e.ziegler@leeds.ac.uk](mailto:l.e.ziegler@leeds.ac.uk)

## Background

The role of nurses and pharmacists in prescribing medicines has been expanding in recent years and the UK's current model of prescribing is widely regarded as being at the international forefront (Latter, 2011). The original policy objectives for the development of non-medical prescribing (NMP) related to the principles set out in the NHS Plan (DH, 2000): improvements in patient care, choice and access, patient safety, better use of health professionals' skills and more flexible team working across the NHS. In working towards these objectives the NHS embarked on a graduated move to increase the scope and responsibilities of non-medical prescribing culminating in the opening of the British National Formulary (BNF) to independent nurse and pharmacist prescribers in 2006 and legislative changes which enabled the prescribing of controlled drugs in 2012. There are now over 1,300 pharmacists and over 18,000 nurse prescribers representing around 3% of the pharmacist and nursing workforce in England.

Some of the benefits of NMP have been substantiated through research (Courtenay, 2008, Carey and Stenner, 2011, Stenner and Courtenay, 2008) and non-medical prescribing continues to grow particularly in disease specific areas such as diabetes, asthma, hypertension and chronic obstructive airways disease. Several studies have identified that prescribing for patients with co-morbid conditions present challenges for non-medical prescribers, raising questions about the potential future impact of NMP within a healthcare system serving an increasing number of older people with multiple long term conditions.

Previous research exploring NMP has focussed almost exclusively on the views of the prescribers (Latter 2011). This research highlights the importance of understanding the barriers and facilitator to implementing NMP practice within routine services. However, empirical studies are required illustrating the growth and impact of NMP because there is concern that NMP is being driven by individual practitioners rather than organisational strategy (Latter 2011). Only half of UK NHS Trusts have a strategy for the development of NMP (Latter 2010). One of the key recommendations of a national evaluation of NMP was that it is necessary to gather and disseminate empirical evidence to demonstrate the clinical and economic impact of NMP (Latter 2011). To date this has not been achieved, possibly due to the

methodological challenges it presents. Establishing the extent of prescribing activity nationally or within a specific patient population is challenging. Although the UK Nursing and Midwifery Council and the General Pharmaceutical Register both maintain a record of members who are qualified prescribers, they do not hold information about the clinical setting in which they work. It would seem logical that the annual growth in non-medical prescribing activity is proportionate to the annual growth in qualified prescribers but previous studies (Courtenay, 2010) have found that many qualified prescribers do not actually prescribe and in some settings such as palliative care, the number of qualified NMPs not prescribing is as high as 50% (Ryan-Woolley et al., 2008). This may in part be explained by palliative care being a particularly challenging speciality for NMPs due to many of the patients having complex comorbid conditions and a high prevalence of pain which until the legislative changes permitting the prescribing of controlled drugs, (DOH, 2012) NMPs were ill equipped to treat. These changes had the potential to transform the scope of NMP in palliative care and facilitate the delivery of effective comprehensive pain management - a central component of high quality end of life care. Palliative care patients are therefore a particularly interesting population in which to examine the impact and growth of NMP.

This study aims to establish the level of NMP activity in palliative care settings across England and consider the likely overall contribution NMPs are making at a national level in this context in relation to medical prescribing.

## **Methods**

### **Source of data**

This study uses data derived from the Prescribing Analysis Cost Tool (PACT) system which is maintained by NHS Prescription Services and covers prescriptions prescribed by GPs, nurses and pharmacists in England and dispensed in the community. Prescriptions issued by non-medical prescribers are identifiable by a unique prescriber code. The PACT system does not indicate the specific clinical setting within community care in which the prescriber is working. We therefore devised a methodological approach which used drugs specific to palliative care

settings and prescriber codes to identify prescriptions most likely to have been issued in palliative care by both medical and non-medical prescribers.

### **Non-analgesic Palliative care prescriptions**

We worked with clinicians and pharmacists with palliative care expertise to identify a core list of drugs used almost exclusively in palliative care settings and are within the prescribing competencies for NMPs. The core list of drugs comprised Haloperidol, Hyoscine Butylbromide, Hyoscine Hydrobromide, and Levomepromazine or Levomepromazine Maleate.

### **Opioids**

Opioids are the mainstay of pain management in palliative care (Gagnon et al., 2015) however they are also used in the management of chronic non cancer pain. To calculate the proportion of all opioid prescriptions issued that were attributable to prescribing in a palliative care context we were guided by research evidence from a large recent cross sectional study which showed that 87.8% of prescriptions for the opioids buprenorphine, fentanyl, morphine and oxycodone were for chronic pain (Zin et al., 2014). Therefore these four drugs were added to our core list of palliative care drugs. We assigned 12% of the total number of medic issued prescriptions for these drugs to palliative care prescribing. Diamorphine was the final opioid added to the core list of palliative care drugs as it is the second most commonly used pain relief drug in the end of life care (Higginson and Gao, 2012). Diamorphine prescriptions were exempt from the adjustments made to the other four analgesics as it is not typically used for chronic pain management.

### **Data extraction**

All prescriptions for any of the 12 items in the core list of palliative care drugs and prescribed by NHS organisations in England and dispensed in the community in the UK between April 2011 and April 2015 were extracted from the PACT system by the Health and Social Care Information Centre in September 2015. The data was broken down by prescriber (medical prescribers, nurse prescribers and pharmacist

prescribers). Prescriptions written in England but dispensed outside England are included. Prescriptions written in hospitals or outpatient clinics that are dispensed in the community, prescriptions dispensed in hospitals, dental prescribing and private prescriptions are not included in PACT data.

## **Analysis**

It was intended that the prescribing activity for nurses and pharmacists would be evaluated separately. However, due to low numbers of prescriptions issued by pharmacists both they were group with nurse prescriptions and the combined group labeled "NMP". Basic descriptive analysis of prescription frequencies are presented by opioid, non-opioids and total prescriptions by year. To evaluate the yearly increase of NMP in relation to medical prescribing the total number of prescriptions were compared by year for each prescribing group (NMP versus medical). Overall changes in the proportion of opioid prescribing compared to non-opioid prescribing between 2011 and 2015 are presented descriptively by prescriber group. To evaluate the whether changes in prescription prevalence were associated with analgesic or non-analgesic prescriptions we separated the non-opioid palliative care prescriptions (Haloperidol, Hyoscine Butylbromide, Hyoscine Hydrobromide, Levomeprom Maleate and Levomepromazine) from the opioid (buprenorphine, fentanyl, morphine and oxycodone, diamorphine) prescriptions issued by NMPs and summarised the number of prescriptions issued for each group year on year

## **Results**

Number of prescriptions issued

Table 1 shows the number of prescriptions issued in palliative care between 2011 and 2015. The total number of prescriptions issued by both medical and non-medical prescribers increased by 25% from 1.2 million to 1.6 million over the four year period. The number of prescriptions issued by nurse prescribers in the same time period has more than doubled from 50,492 in 2011 to 106,462 in 2015.

The average annual increase in NMP issued prescriptions was 28% compared to an average annual increase of 9% in prescriptions issued by medics. Despite this, the annual growth in NMP was less than 1% a year in relation to total community palliative care prescribing activity in England. By 2015 NMPs were responsible for 6.7% of all prescriptions issued in community palliative care compared with 4.2% in 2011.

### Types of drugs prescribed

The yearly total of analgesic and non-analgesic prescription are presented in Figure 1. The total number of opioid prescriptions issued increased approximately 30% each year; (31% 2012-2013; 28% 2013-2014; and 33% 2014-2015). The number of non-opioid prescriptions issued by non-medical prescribers showed a similar trend initially with a 32% increase between 2012 and 2013. For subsequent years however the rate of increase slowed with a 12% increase between 2013 and 2014 and a 10% increase between 2014 and 2015. This illustrates that the growth in total prescriptions issued by non-medical prescribers over the 2011-2015 period is almost entirely attributable to an increase in opioid prescriptions.

We explored whether medical prescribing had followed the same trend. Figure 2 illustrates that in 2011 opioids accounted for approximately 66% of prescriptions issued by both medical and non-medical prescribers. For medical prescribers this proportion remained stable (rising 1% to 67% in 2015) whereas for non-medical prescribers by 2015 opioids represented 76% of their overall prescribing activity.

### Discussion

This study set out to address a stated need (Scrafton et al., 2012, Creedon et al., 2015) for data to establish the level of NMP activity at a national level and consider the likely overall contribution NMPs are making in relation to medical prescribing. To

the best of our knowledge no previous studies have attempted to quantify prescribing longitudinally in a specific patient population and consequently it was necessary to design and pilot a methodological approach to achieve this. The approach we have taken could be adapted using a 'core list of drugs' specific to other patient populations to determine the extent of NMP in other contexts.

We have identified that a year on year growth in the number of prescriptions issued by non-medical prescribers in palliative care. However, the proportion of NMPs issued in relation to medical prescribing remains relatively small. At the current rate of growth it will be 20 years before non-medical prescribers are prescribing 25% of all drugs issued in community palliative care.

The number of opioid prescriptions issued by non-medical prescribers started to increase following the 2012 legislative changes (DOH, 2012) which permitted NMPs to prescribe controlled drugs, previously NMPs were only able to prescribe these drugs with the oversight of a medical colleague. The growth in opioid prescribing suggests NMPs have fully embraced the opportunity. NMP issued prescriptions for non-opioid medications have remained relatively stable over the same time period. This may simply reflect the fact that pain is the most prevalent symptom in end of life care (Gagnon et al., 2015) and as NMPs are now able to prescribe appropriate medication to manage it, it follows that it is likely to constitute a growing proportion of their prescribing activity.

In terms of the impact of NMP on patient care, we have considered whether our data can determine if NMP could contribute to the national objective of improving pain control at the end of life (NICE, 2012)? The original policy objectives of implementing NMP (DOH, 2006) were to enable faster more responsive access to medications and relieve the prescribing burden from medical colleagues. Whilst this study cannot determine whether NMP has influenced the timing of access to medication, our data provides empirical evidence to demonstrate NMPs are prescribing the full range of drugs at their disposal and supports the finding of previous studies into the benefits of the NMP role in palliative care and other healthcare contexts (Ziegler et al., 2015, Stenner and Courtenay, 2008, Stenner et



al., 2011). It is therefore reasonable to conclude that NMP activity positively contributes to improved pain control at the end of life.

In terms of whether NMP is relieving the prescribing burden borne by medical colleagues, our data indicate that NMP is taking over from medical prescribing activity in palliative care at a rate of 1% each year. Impact on medical prescribing (in terms of number of prescriptions issued) is therefore minimal and the ability to increase this impact is made more difficult by the current growth in the palliative care population which creates an ever increasing demand for prescriptions.

It is arguable whether the number of prescriptions issued provides an accurate reflection on the impact of the NMP's role. Earlier studies (Ziegler et al., 2015, Ryan-Woolley et al., 2007) have found that the role of non-medical prescribers working in palliative care extends beyond issuing prescriptions. Prescribers reported a significant proportion of 'prescribing' time is spent reviewing and rationalising current medication, discontinuing drugs and titrating doses. Polypharmacy is common in end of life care and minimising adverse effects by reviewing and discontinuing unnecessary or contraindicated medication is an important NMP activity which our data does not capture.

## **Conclusions**

Until now we have relied on local service level audits of NMP prescribing practice to chart the growth in prescribing activity which is often used as evidence of successful implementation and impact of NMP and provides justification for further service level investment. This study demonstrates for the first time that although a growth in NMP is evident, the number of prescriptions issued remains small in relation to medical prescribing. NMPs are prescribing the full range of drugs and proportionately more opioids than doctors. This suggests that although their impact in terms of numbers of prescriptions issued is small, the mainstay of their prescribing activity is pain management which is of crucial importance in end of life care.

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Figure 1 Prescribing activity by non-medical prescribers 2011-2015

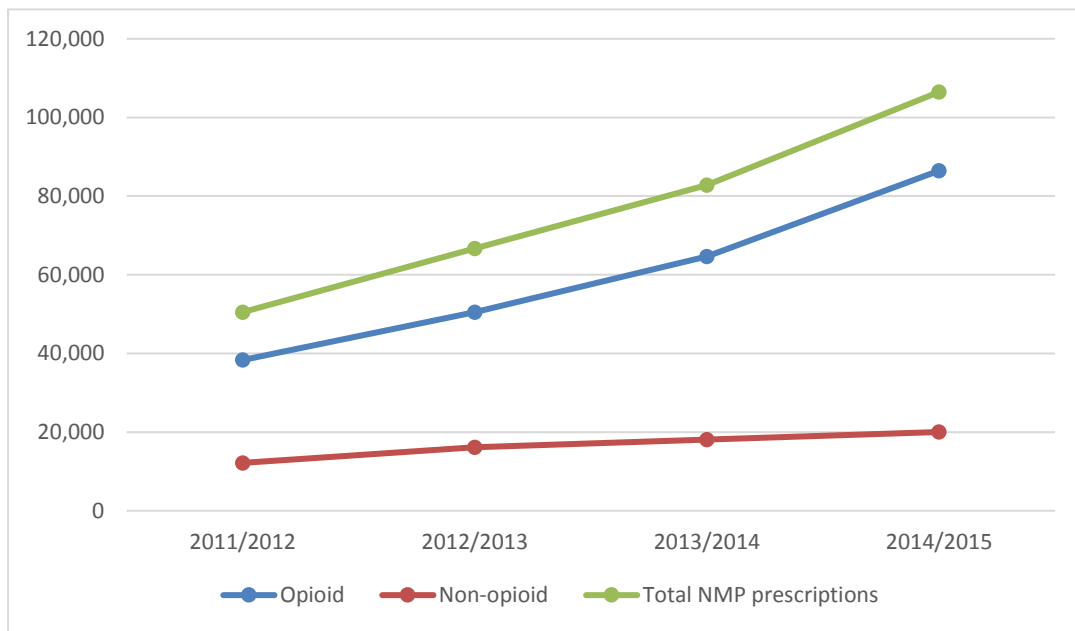


Figure 2; Proportion of opioid prescribing undertaken by NMPs and medical prescribers during 2011 and 2015

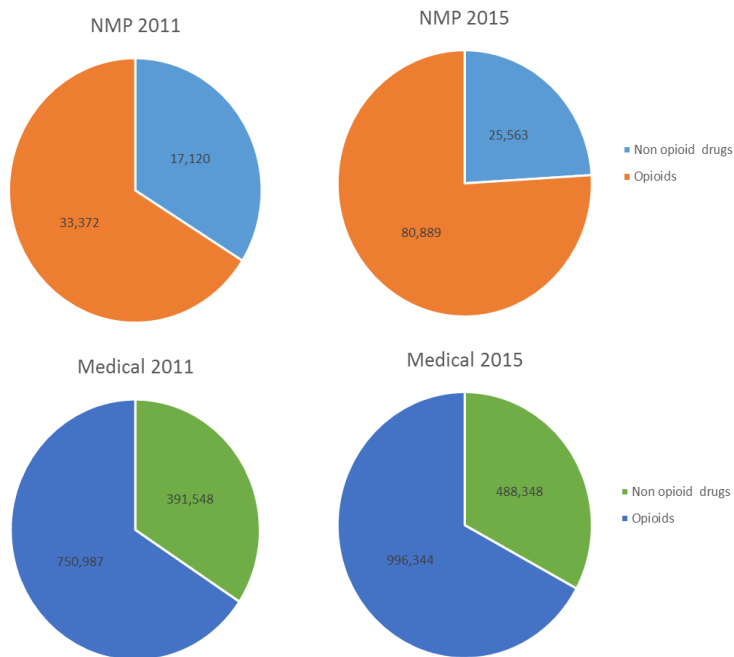


Table 1 – Palliative care prescribing activity 2011-2015: comparing medical and non-medical prescribers.

Parameter	Year											
	2011/2012			2012/2013			2013/2014			2014/2015		
	Medical	NMP	All	Medical	NMP	All	Medical	NMP	All	Medical	NMP	All
Buprenorphine	152,828	5,264	158,092	167,537	7,113	174,650	185,912	10,627	196,539	208,675	14,716	223,391
Diamorphine	113,309	4,876	118,185	113,857	5,518	119,375	109,692	5,362	115,054	114,088	5,556	119,644
Fentanyl	128,746	5,694	134,440	133,692	6,731	140,423	139,850	8,123	147,973	143,426	11,061	154,487
Haloperidol	28,803	1,567	30,370	32,706	1,955	34,661	37,445	2,331	39,776	43,844	2,769	46,613
Hyoscine Butylbromide	35,701	1,580	37,281	41,806	2,207	44,013	47,470	2,575	50,045	58,230	3,098	61,328
Hyoscine Hydrobromide	32,012	1,560	33,572	35,374	1,809	37,183	34,763	1,922	36,685	31,655	1,768	33,423
Levomeprom Maleate	36,136	440	36,576	37,616	565	38,181	38,844	609	39,453	38,654	634	39,288
Levomepromazine	44,307	2,154	46,461	48,899	3,066	51,965	51,414	3,480	54,894	56,810	3,623	60,433
Midazolam	101,280	4,867	106,147	1,19,379	6,546	125,925	127,087	7,177	134,264	145,067	8,125	153,192
Morphine Sulfate	348,408	17,088	3,65,496	395,866	23,644	419,510	442,336	30,344	472,680	489,730	41,414	531,144
Oxycodone	121,007	5,402	1,26,409	130,262	7,499	137,761	141,968	10,219	152,187	154,515	13,698	168,213
<b>Total</b>	<b>1,142,537</b>	<b>50,492</b>	<b>1,193,029</b>	<b>1,256,994</b>	<b>66,653</b>	<b>1,323,647</b>	<b>1,356,781</b>	<b>82,769</b>	<b>1,439,550</b>	<b>1,484,694</b>	<b>106,462</b>	<b>1,591,156</b>
<b>Percentage of yearly total</b>	95.8	4.2	100	95.0	5.0	100	94.3	5.7	100	93.3	6.7	100
Total increase on previous year	-	-	-	114,457	16,161	66,653	99,787	16,116	115,903	127,913	23,693	151,606
Percentage increase on previous year	-	-	-	10.0	32.0	5.6	7.9	24.2	8.8	9.4	28.6	10.5

NMP = Non-medical prescriber