Title

A comparison of opioid prescription trends in England and the United States from 2008 to 2020

Short title:

Prescription opioid trends: England and USA

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ABSTRACT

Background

The prescription opioid epidemic in the United States (US) is well documented, and recent measures have reduced prescribing rates in that country. Evidence suggests opioid prescriptions have been rising recently in other countries too.

Objective

The current paper aimed to compare trends in opioid prescribing in England and the US.

Methods

Trends in rates of prescriptions per 100 members of the population were calculated for England and the US using publicly available government data on prescriptions and population statistics.

Results

Rates of prescribing are converging. At the peak of the US epidemic in 2012, there were 81.3 prescriptions per 100 people, but this had fallen to 43.3 by 2020. Prescribing peaked in England in 2016 at 43.2 prescriptions per 100 people, but has fallen only slightly, so that in 2020 there were 40.9 prescriptions per 100 people.

Conclusions

The data indicate that levels of opioid prescribing in England are now similar to those in the US. They remain high in both countries, despite recent falls. This suggests the need for further measures to prevent over-prescribing and to support people who would benefit from withdrawing from these drugs.

KEYWORDS:

Opioids; prescribing trends; opioid dependence; opioid epidemic; opioid prescriptions

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INTRODUCTION

The epidemic of prescription opioid use in the United States (US) has been well-documented, along with the high number of deaths associated with it (1, 2). Public health measures, including the implementation and extension of prescription monitoring programmes, restriction of manufacturing and supply, public education and increased investment in prevention and treatment have been introduced to curb prescribing and its harmful effects (3-7). Prescribing has been declining since 2012 (8).

There has been less coverage of the situation elsewhere in the world, but evidence suggests that prescriptions of opioids have been increasing in some European countries (9, 10). Data from the United Kingdom (UK) show rising opioid prescriptions, associated with areas of greater social deprivation (11). Prescriptions rose by 34% between 1998 and 2016, with the equivalent dose of morphine increasing by 127% (12). There is also evidence of a rising number of associated deaths (13). Moreover, a large proportion of people prescribed these drugs become long-term users. A recent public health report found up to 60% of users were prescribed the drugs for more than 12 months (14).

Official and professional concern about increasing prescription of opioids in the United Kingdom (UK) has started to emerge, especially since accumulating evidence suggests they have limited effects in non-cancer pain (15). In 2019, Public Health England published a review of long-term use of, and dependence on opioids and other prescription drugs (14). Subsequent initiatives include the commission of National Institute for health and Care Excellence (NICE) guidelines on safer prescribing and withdrawal management for prescription drugs, including opioids (16). As in the US, rates of prescribing appear to be reducing in the UK, but only modestly (12). In the following paper we present comparative trends in the number of prescriptions relative to the size of the population in the US and England since 2006.

METHODS

Data on opioid prescriptions was obtained from government sources in the US and UK. A prescription in both countries consists of a written direction to provide a patient with a particular medicine, written by a healthcare profession, usually a doctor. US data from 2006 to 2020 was obtained from the Center for Disease Control and Prevention (CDC). It is presented in terms of the number of prescriptions per 100 people in the population, figures that have been calculated using estimates from the US census bureau (8). This data is based on a sample of 50,400 community pharmacists that dispense nearly 92% of retail prescriptions in the US. Prescriptions of any duration between 1 and 365 days are included. Prescriptions for buprenorphine, codeine, fentanyl, hydrocodone, hydromorphone, methadone, morphine, oxycodone, oxymorphone, propoxyphene, tapentadol, and tramadol are included. The data excludes cough and cold preparations that contain opioids, formulations of buprenorphine commonly used to treat opioid addiction and methadone dispensed through methadone treatment programmes. In addition, since 2017, a small number of prescriptions that were voided before they reached the patient have been excluded from the data, resulting in a 1.9% 'downward shift' in measured opioid prescriptions dispensed since that year (8).

Data on prescriptions issued in England was obtained from 2008 from the Prescription Cost Analysis (17). This data includes all National Health Service prescriptions dispensed in the community for any duration. Private prescriptions, which are not commonly used in the UK, are not included. The data is categorised by individual drug and organised into drug classes. We included data on the following drugs: buprenorphine, codeine, diamorphine, dihydrocodeine, dipipanone, fentanyl, hydrocodone, hydromorphone, methadone, meptazinol, morphine, oxycodone, papaveretum, pentazocine, pethidine, tapentadol, and tramadol. We did not include cough and cold preparations that contain opioids. There is no information about how voided prescriptions are managed. The data in the Prescription Costs Analysis is presented as the total number of prescriptions issued. We converted it into the number of prescriptions per 100 members of the population using population estimates of the English population obtained from the Office of National Statistics (18).

Both sources include prescriptions actually dispensed in the community and exclude hospital data. Neither data set contains information on dose. The data do not indicate the number of people prescribed these drugs, since people who are prescribed opioids tend to receive many, 'repeat' prescriptions. However, calculating the number of prescriptions per unit of population enables comparisons of the volume of prescribing across the two countries, bearing in mind the differences between the two data sets.

RESULTS

Figure here

The Figure shows trends in the rates of prescribing of opioids in England and the US since 2006 and 2008 to 2020. At the start of the US data in 2006, there were 72.4 opioid prescriptions per 100 persons, and prescribing peaked in 2012 when it had risen to 81.3 opioid prescriptions per 100 persons – representing a 12% increase from 2006. Since 2012 opioid prescription rates in the US have fallen to 43.3 prescriptions per 100 persons in 2020; a 46.7% decrease.

In comparison, there were 28.6 prescriptions per 100 persons in England at the start of available data in 2008, which rose to a peak of 43.2 prescriptions per 100 persons in 2016. This represents a 51.0% increase since 2008. England's prescription rates have also fallen more recently, but less steeply than in the US. The opioid prescribing rate per 100 persons was 40.9 in 2020 – only a 5.3% decrease since the peak of 2016. In 2008, the first year with data from both countries, the difference between rates of opioid prescribing in the US and England was 49.6%, but with the large decrease in US prescribing and relatively smaller decrease in prescribing in England, the difference in 2020 was only 2.4%.

DISCUSSION

Although there are some differences between the data sets, it appears that levels of opioid prescribing in England are now almost as high as they are in the US. Despite recent declines, rates of prescribing remain high in both countries. Enough prescriptions are issued in the US and England at present for around 40% of the population to receive one (if each prescription was issued to a different person).

Rates of prescribing in the US have declined by almost half since their peak in 2012, reflecting concerted public health measures (3-5). Prescribing rates in England have declined only marginally,

though from a lower peak level, but there is increasing concern in the UK too that current levels of prescribing are wasteful of resources and expose people to risks and complications of opioids, including death and dependence, that are not justified by therapeutic benefits (14, 19). Recently published NICE guidance aims to reduce prescribing and facilitate withdrawal where appropriate (16).

The data does not reflect the actual number of people who receive prescriptions. In addition, information on the dose of prescription items, the relative strength of different preparations or defined daily dose is not provided in either data set. Other evidence suggests there has been an increase in the prescription of high strength opioids over the last two decades, so the amount of morphine equivalent being used has increased more sharply than the number of prescriptions (12). The data relate to England specifically, but there is no reason to believe trends are different in other parts of the UK.

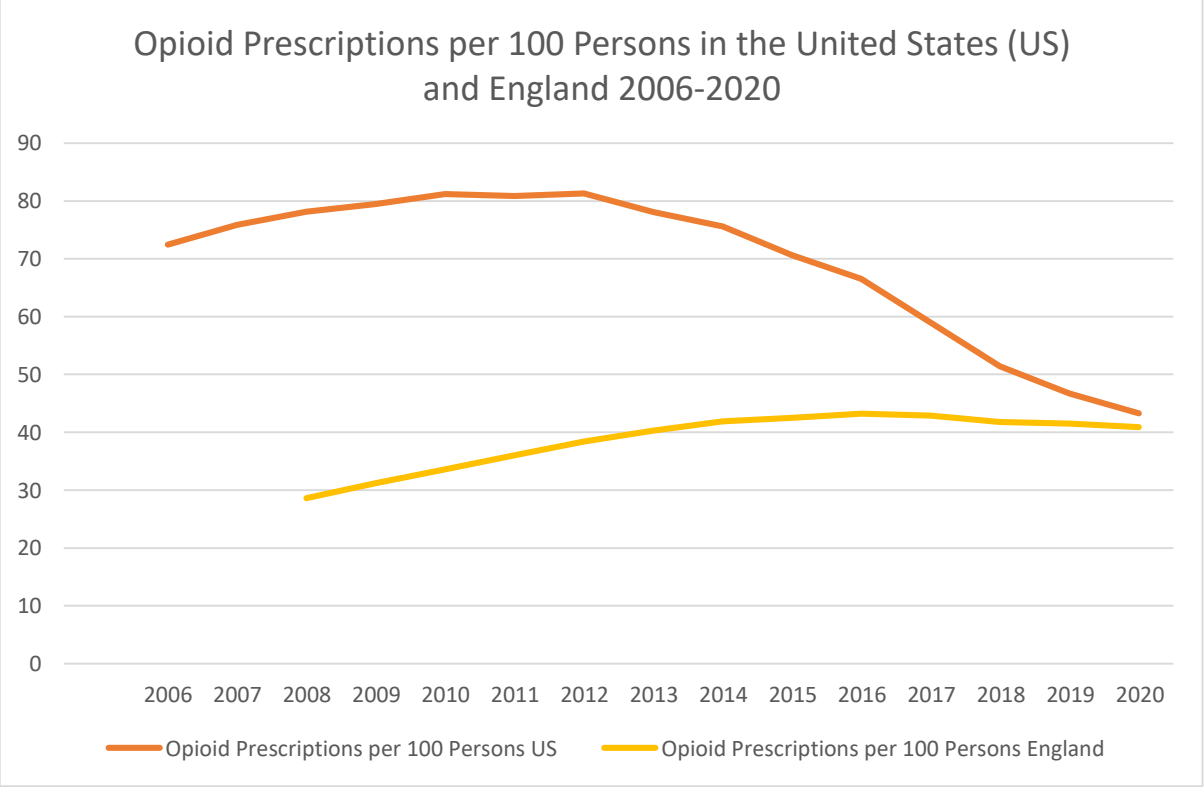
There are some differences between the US and UK data sets. The US data excludes buprenorphine preparations commonly used for treatment of substance misuse and methadone dispensed through methadone treatment programmes. In the UK data methadone made up small minority of opioid prescriptions, however, 0.1% in 2020, for example, so this is unlikely to have an impact on the data. The exclusion of some buprenorphine preparations from the US data may be significant, but the increase in prescribing in the UK does not appear to be due to substance misuse treatment, as the number of people receiving treatment for illicit opioid addiction has been declining since 2008 in England (20). The UK data set excludes private prescriptions. There are no data on how common these are, but a large majority of prescribing in the UK is through the NHS. In addition, a small part of the declining trend in the US since 2017 is due to the exclusion of voided prescriptions from the data from this time. Moreover, types of opioids commonly prescribed and licensed in the UK and US are likely to vary, but there is no data on relative use of different agents in the US.

Despite these differences, the fact that levels of opioid prescribing in England are now approximately as high as they are in the US suggests there may be a need for further measures to reduce the extent of unnecessary and potentially harmful prescribing in the UK. The recent NICE guidelines (16) will be useful in this regard, and services to support withdrawal for people who have become dependent may also be required.

Conflicts of Interest statement:

Neither author has any conflicts of interest

Figure


Opioid Prescriptions per 100 Persons in the United States (US) and England 2006-2020
90
80
70
60
50
40
30
20
10
0
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Opioid Prescriptions per 100 Persons US
Opioid Prescriptions per 100 Persons England

References

1. National Academies of Sciences E, and Medicine,, Health and Medicine Division, Board on Health Sciences Policy, Committee on Pain Management and Regulatory Strategies to Address Prescription Opioid Abuse, Phillips JK, Ford MA, et al. Pain Management and the Opioid Epidemic: Balancing Societal and Individual Benefits and Risks of Prescription Opioid Use. In: Phillips JK, Ford MA, RJ B, editors. Trends in Opioid Use, Harms, and Treatment. Washington (DC): National Academies Press; 2017.
2. National Institute on Drug Abuse. Overdose death rates Washington (DC): National Institute of Health; 2021 [Available from: https://www.drugabuse.gov/drug-topics/trends-statistics/overdose-death-rates.
3. Davis CS, Pierce M, Dasgupta N. Evolution and convergence of state laws governing controlled substance prescription monitoring programs, 1998-2011. Am J Public Health. 2014;104(8):1389-95.
4. United States Drug Enforcement Administration (DEA). Justice Department, DEA propose significant opioid manufacturing reduction in 2019 Washington (DC): United States Drug Enforcement Administration (DEA)

2018 [Available from: https://www.dea.gov/press-releases/2018/08/16/justice-department-dea-propose-significant-opioid-manufacturing-reduction.
5. U.S. Food and Drug Administration. Timeline of Selected FDA Activities and Significant Events Addressing Opioid Misuse and Abuse 2021 [Available from: https://www.fda.gov/drugs/information-drug-class/timeline-selected-fda-activities-and-significant-events-addressing-opioid-misuse-and-abuse.
6. Soelberg CD, Brown RE, Jr., Du Vivier D, Meyer JE, Ramachandran BK. The US Opioid Crisis: Current Federal and State Legal Issues. Anesth Analg. 2017;125(5):1675-81.
7. U.S. Department of Health and Human Services (HHS). 5-Point Strategy To Combat the Opioid Crisis Washington (DC): U.S. Department of Health and Human Services (HHS)

2021 [Available from: https://www.hhs.gov/opioids/about-the-epidemic/hhs-response/index.html.
8. Centers for Disease Control and Prevention (CDC). U.S. Opioid Dispensing Rate Maps Washington (DC): Centers for Disease Control and Prevention (CDC)

2020 [Available from: https://www.cdc.gov/drugoverdose/rxrate-maps/index.html.
9. Seyler T, Giraudon I, Noor A, Mounteney J, Griffiths P. Is Europe facing an opioid epidemic: What does European monitoring data tell us? Eur J Pain. 2021;25(5):1072-80.
10. Hurtado I, Garcia-Sempere A, Peiro S, Sanfelix-Gimeno G. Increasing Trends in Opioid Use From 2010 to 2018 in the Region of Valencia, Spain: A Real-World, Population-Based Study. Front Pharmacol. 2020;11:612556.
11. Mordecai L, Reynolds C, Donaldson LJ, de CWAC. Patterns of regional variation of opioid prescribing in primary care in England: a retrospective observational study. Br J Gen Pract. 2018;68(668):e225-e33.
12. Curtis HJ, Croker R, Walker AJ, Richards GC, Quinlan J, Goldacre B. Opioid prescribing trends and geographical variation in England, 1998-2018: a retrospective database study. Lancet Psychiatry. 2019;6(2):140-50.
13. Faculty of Pain Medicine of the Royal College of Anaesthetists. Current UK data on opioid misuse London: Royal College of Anaesthetists

2021 [Available from: https://fpm.ac.uk/opioids-aware-clinical-use-opioids/current-uk-data-opioid-misuse.
14. Taylor S, Annand F, Burkinshaw P, Greaves F, Kelleher M, Knight J, et al. Dependence and withdrawal associated with some prescribed medicines: an evidence review. London; 2019.

15. Stannard C, Moore A. Traditional opioids for chronic non-cancer pain: untidy, unsatisfactory, and probably unsuitable. Evidently Cochrane [Internet]. 2016. Available from: https://www.evidentlycochrane.net/opioids-chronic-non-cancer-pain/.
16. NICE. Medicines associated with dependence or withdrawal symptoms: safe prescribing and withdrawal management for adults (NG 2015). London: NICE; 2022. Available from: https://www.nice.org.uk/guidance/ng215.
17. Prescription Cost Analysis [Internet]. NHS Digital. 2021. Available from: https://digital.nhs.uk/data-and-information/publications/statistical/prescription-cost-analysis/.
18. Office for National Statistics. England population mid-year estimate London2020 [Available from: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/timeseries/enpop/pop.
19. Davies J, Cooper RE, Moncrieff J, Montagu L, Rae T, Parhi M. The costs incurred by the NHS in England due to the unnecessary prescribing of dependency-forming medications. Addict Behav. 2022;125:107143.
20. Office for Health Improvement and Disparities. Adult substance misuse treatment statistics 2020 to 2021: report. London: Office for Health Improvement and Disparities; 2022. Available from: https://www.gov.uk/government/statistics/substance-misuse-treatment-for-adults-statistics-2020-to-2021/adult-substance-misuse-treatment-statistics-2020-to-2021-report#trends-over-time.