Opioid rain: opioid prescribing is growing and practice is diverging

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A fit, active, 57-year-old man of petite build, just 1.6 m tall, and weighing 50 kg, with “a long history of clean, drug-free living” is found dead in an elevator—his death is attributed by the coroner to a fatal overdose of self-administered fentanyl.1,2

Prince, the singer, songwriter, multi-instrumentalist and musical icon, died from an overdose of a strong opioid that in patch form is funded for use in New Zealand. Other strong opioids funded here include methadone, morphine, oxycodone and pethidine. A “strong” opioid is one classed as step 3 on the World Health Organization (WHO) analgesic “ladder” for cancer pain management, after weak opioids (tramadol, codeine and dihydrocodeine are subsidised in New Zealand) at step 2, and non-opioids (such as nonsteroidal anti-inflammatory drugs and paracetamol) at step 1.3

However, the benefits of opioids for chronic non-cancer pain have limited evidence, while the harms are increasingly apparent, including tolerance, adverse effects, aberrant behaviour, addiction, falls, overdose and death.4–8

In the US, commentators are describing a “prescription opioid overdose crisis” and an “epidemic” of addiction, abuse and overdose.9,10 The US Centers for Disease Control and Prevention (CDC) have released a new guideline for prescribing opioids for chronic pain in response to the astonishing figures:11–13

• Since 1999, sales of prescription opioids in the US have quadrupled.
• In 2012, prescribers wrote 82.5 opioid pain relief prescriptions per 100 people in the US.14
• From 1999 to 2014, more than 165,000 Americans are estimated to have died from a prescription opioid overdose.11

An estimated one in five American patients with non-cancer pain or pain-related diagnoses is prescribed an opioid. This figure doubled between 2000 and 2010 while non-opioid analgesic prescribing remained unchanged.11,15

• Wide regional variation in prescribing rates in the US is “unlikely to be attributable to underlying differences in the health status of the population.”14

In the UK work examining prescribing patterns suggests similar growth patterns to the US,16,17 but does the UK have “an epidemic of prescription opioid misuse and mortality”? Commentators suggest—due to the lack of reliable data—“maybe not” or “not yet”.18

“Opioids are neither an easy nor necessarily effective solution to the problem” of persistent pain, and indeed—fraught with problems of measurement—research has shown a 90–100% failure rate for strong opioids in treatment of chronic non-cancer pain.19

Thus opioids are a classic contender for wide variation in prescribing practice: evidence is patchy and evolving, indications are ambiguous and subject to individual interpretation, and patient preference is not well-informed. So what’s going on in New Zealand?

Opioid use in New Zealand—new data in the Atlas of Healthcare Variation

The opioid domain of the New Zealand Atlas of Healthcare Variation has been updated today with 2014 and 2015 data, tracking ten indicators of opioid use nationally and by district health board.
How do we compare internationally and between different parts of the country? Sixteen point four people per 1,000 were dispensed a strong opioid in New Zealand in 2015, a figure that has remained doggedly stable since 2011 (14.3 per 1,000) despite the increasing awareness of opioid-related harms and growing literature attesting to their dubious effectiveness in managing chronic non-cancer pain. Moreover, within that persistently “false flat” national mean (it may look level but is in fact a steady incline) lie 12,000 more people on a strong opioid between 2011 and 2015, and a more than twofold difference in the opioid dispensing behaviour of DHBs (see Figure 1).

By way of contrast, rates of opioid prescribing in Japan and many continental European countries have barely increased at all. International comparison suggests that other developed countries are able to manage without such high rates of opioid use but also that we are not alone in this problem (see Table 1).

Differences between comparable countries is one thing, but a twofold difference in the dispensing behaviour of DHBs raises questions. The purpose of atlases of variation in healthcare practice is not to assert that one or another figure is necessarily wrong, but given two such wildly varying practices both can’t be right. Atlases are the starting point in exploring varying practice where evidence is ambivalent or not being acted upon, where we find out where we sit in comparison with each other and how our practice changes over time.

So what’s going on?

Table 1: Selected opioid consumption by country; 2014.

<table>
<thead>
<tr>
<th>Country</th>
<th>Milligrams (mg) morphine/capita</th>
<th>mg oxycodone/capita</th>
<th>Morphine equivalent excluding methadone/capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>134</td>
<td>84</td>
<td>732</td>
</tr>
<tr>
<td>US</td>
<td>74</td>
<td>194</td>
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<td>49</td>
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<td>48</td>
<td>212</td>
</tr>
<tr>
<td>New Zealand</td>
<td>45</td>
<td>27</td>
<td>155</td>
</tr>
<tr>
<td>Japan</td>
<td>2</td>
<td>4</td>
<td>24</td>
</tr>
</tbody>
</table>

NB. Consumption refers to amounts distributed to the retail level, not amounts dispensed to, or used by, patients. “Morphine equivalent” is an aggregate measure of the following strong opioids: fentanyl, hydromorphone, morphine, oxycodone, and pethidine.

* Weighted average: Denmark, Finland, Iceland, Norway, Sweden.
New data and what we can know

Digging deeper into the new data there are some striking findings.

Strong opioid prescribing continues to increase, and of those dispensed a strong opioid in 2015, most received morphine. The number of people dispensed morphine has significantly increased since 2011, from 7.5 to 11 per 1,000—approximately 17,600 more people in absolute numbers. More than 10% of those on morphine were taking it for six or more weeks.

Rates of both strong and weak opioid dispensing were higher in people of European or other ethnicity (as compared with Māori, Pacific or Asian ethnicities), and higher in women and people aged 80 and over (on which more later).

Another of the indicators in the atlas is people dispensed a strong opioid who had a public hospital event in the eight days prior. Nearly half of all New Zealanders dispensed a strong opioid had recently attended a public hospital event in the eight days prior. Nearly half of all New Zealanders dispensed a strong opioid had recently attended a public hospital as an inpatient or outpatient, suggesting these prescriptions are generated in hospital (see Figure 2).

The good news—oxycodone

But there is good news in what can be achieved in New Zealand.

Oxycodone is a strong synthetic opioid that was introduced to New Zealand in the early 2000s as a “new and improved” morphine—fewer side effects and less stigma and patient resistance. The drug was heavily marketed in the US in the 1990s on the basis of evidence now refuted, leading to federal charges against a manufacturer and the largest fine ever paid by a pharmaceutical company.\(^5\) Dispensing rates of oxycodone in New Zealand increased by 249% between 2007 and 2011,\(^6\) before mounting international evidence for adverse effects, addiction, emergency admissions, overdoses and mortality began to influence prescribing practice.\(^23–25\)

The Atlas has shown significant reductions in oxycodone dispensing with a rate of 5.4 people per 1,000 receiving the opioid in 2015, down from 7.3 per 1,000—7,800 fewer people in absolute numbers, compared to 2011. In DHBs where dedicated campaigns have sought to address optimal prescribing, the outcomes have been particularly positive. Nelson Marlborough and Wairarapa DHBs have reduced their dispensings of oxycodone by 60–70% and fallen below the national mean (see Figure 3).

It’s not all good news though. There remains extensive—more than threefold—
variation between many DHBs in oxycodone prescribing: 1.3 people per 1,000 (and falling) in Capital & Coast DHB; 12.3 per 1,000 in Bay of Plenty in 2015 (see Figure 4). Explicable through demography or differences in patient preference, or are people doing things differently? If so, why?

A special case: ageing, aged residential care (ARC) and fentanyl

Engagement and awareness appears to be driving a rationalisation in oxycodone prescribing, but elsewhere are some alarming findings. Adverse effects of strong opioids are more frequent in the older population, including constipation, falls, changes to mental status, and nausea.26,27 Yet strong opioid prescribing rates for those over 80 years are six to seven times higher than the rates for those under 65 (see Figure 5). Furthermore, these prescribing rates are rising: in the 80+ age group, 105.4 people in 1,000 were prescribed a strong opioid in 2013; a year later that figure was 111.4 per 1,000. In 2015 it was 112.3.

On top of this, rates of prescribing are higher in aged residential care (ARC) than in the community. Access to primary care support, allied health and pain management specialists, and pharmacists is problematic for ARC so treatment may not be ideal in this vulnerable group. Pain is under-reported in the cognitively impaired so it is in fact even possible we are under-treating some ARC patients.28

Fentanyl is a strong opioid recommended for people with chronic cancer pain as an alternate option after morphine and depending on patient circumstances. Fentanyl is convenient: a three-day patch that doesn’t require qualified staff for twice-daily administration. However, the drug has the potential for severe adverse effects such as significant respiratory depression in opioid-naïve patients or those with chronic obstructive pulmonary disease (COPD).29 It is cautioned in those with hepatic or renal impairment, or bradyarrhythmias.29 Fentanyl can have life-threatening opioid toxicity in those with chronic skin conditions30 and can be addictive like other opioids. Elderly patients have increased sensitivity.29

The Atlas shows fentanyl dispensing is rising year on year in roughly half of all DHBs despite clear evidence of consistently
low usage in one large DHB. In fact, fentanyl dispensing varied sixteen-fold between DHBs in 2015 (see Figure 6).

Is it possible that fentanyl is being used in lieu of oxycodone as awareness grows of the dangers of the latter but not the former?

Further preliminary analysis has been conducted by the Atlas expert advisory group comparing dispensing rates of morphine, oxycodone and fentanyl to people 65 and over living in ARC versus those in the community. (Those in ARC receiving higher levels of care, such as rest-home hospital, dementia or psychogeriatric care, were excluded to increase comparability between groups.) The results are shown below (Figure 7).

All strong opioids were prescribed more in ARC than the community; morphine up to five times so. Oxycodone dispensing trended downwards in both settings but all other strong opioids increased over the three years and increased more rapidly in residential care. Dispensing of fentanyl in ARC almost doubled.

Why it’s hard: “If all variation were bad, solutions would be easy”31

General practitioners (GPs) prescribing in ARC describe some of the complicated issues at play.32

In general, more people at higher acuities are being admitted to ARC and receiving palliative care. Meeting their needs, particularly in smaller DHBs, is challenging as the problem is multi-faceted and structural. Staffing issues and lack of access to specialist pain and palliative services means requests for relief from bad pain are often met by nurses or clinicians unaware of the pain history, and who may not have the time or training to design a tailored pain management program or initiate de-escalation of analgesia. (It is instructive to note there are only 11.5 full-time equivalent pain specialists in New Zealand,33 and GP ARC visits can be three months apart.) Plus there are communication deficits and issues of cognitive impairment in patients with moderate to severe dementia.

A lack of shared knowledge on the part of clinicians and patients not only of effec-

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**Figure 6:** People dispensed fentanyl by DHB: total by year, rate per 1,000.

Legend: Red = national mean; purple = selected DHBs

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**Figure 7:** Percentage of population 65 and over dispensed morphine, oxycodone and fentanyl in the community versus those living in aged residential care (rest home) by year to 2014.

Source: Health Quality & Safety Commission routine data analysis 2016. NZ resident population derived from StatsNZ population projections.
tiveness but also side effects of strong opioids exacerbates the problem. Patients and residents, for example, can resist morphine because they fear it signals they're dying, but often don't want a so-called “weak” opioid—they want the best, which means the strongest. Strong opioids do not necessarily mean strong analgesia.

There are others who are not even aware they are on an opioid.

Change is possible

Nelson Marlborough and Wairarapa DHBs show that where the problem is clear, improvement is possible. The Find My Patients query tool in primary care patient management systems, developed by the Health Quality & Safety Commission, can be used by GPs to identify patients in their own practice who are prescribed a strong opioid: 24

A) for at least a month, by individual medicine
B) and who have diagnosed COPD where strong opioids are either contra-indicated or have a caution
C) have no co-prescribed stimulant laxative to deal with the common side effect of constipation.

The first step is finding out where as a DHB one stands, how that prescribing practice compares with others and how it has changed over time. The Atlas can help.

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11. US Centers for Disease Control and Prevention


31. Mulley AG. Improving productivity in the NHS. BMJ. 2010 Jul 27;341:c3965. doi: 10.1136/bmj.c3965.


33. Faculty of Pain Medicine, Australian and New Zealand College of Anaesthetists audit of fellows 2016.

34. Health Quality & Safety Commission. The Find My Patients tool is accessible via the link on the lower right hand side of the relevant Atlas page.