Trends in dispensing ADHD medication to New Zealand youth

STEPHANIE D’SOUZA
Access to the data presented was managed by Statistics New Zealand under strict micro-data access protocols and in accordance with the security and confidentiality provisions of the Statistic Act 1975. Our findings are not Official Statistics. The opinions, findings, recommendations, and conclusions expressed are those of the researchers, not Statistics NZ.
National Science Challenges

A BETTER START
E Tipu e Rea

AGEING WELL
Kia eke hauranga ki te takuau mātuoanga

BUILDING BETTER HOMES, TOWNS AND CITIES
Ko Ngā whai Kāinga hei whakamāhorahora

HEALTHIER LIVES
He Oranga Hawaika

HIGH-VALUE NUTRITION
Ko Ngā Kai Whai Pāunga

NEW ZEALAND’S BIOLOGICAL HERITAGE
Ngā Koiora Tuku Iho

OUR LAND AND WATER
Tūranga te Whenua, Tūranga te Wai

RESILIENCE TO NATURE’S CHALLENGES
Kia manawaroa – Ngā Ākina o Te Ao Tūria

SCIENCE FOR TECHNOLOGICAL INNOVATION
Kia kotahi mai – Te Ao Pāraa o Te Ao Hangarau

SUSTAINABLE SEAS
Ke ngā moana whakauka

THE DEEP SOUTH
Te Kāmata o Te Tonga
National Science Challenges

A BETTER START
E Tipu e Rea

BIG DATA

- HEALTHY WEIGHT
- RESILIENT TEENS
- SUCCESSFUL LEARNING AND LITERACY
Attention-deficit/hyperactivity disorder
DSM-5 Diagnostic Criteria

- **16 years or under**: 6+ symptoms
- **17 years plus**: 5+ symptoms

- Behaviour/symptoms are:
  - Present for 6 months
  - Inappropriate for developmental level
  - Disruptive
  - Present before 12 years and in multiple settings
Management

- Counselling/therapy
- Lifestyle changes
- Medication
Prevalences

Worldwide prevalence of ADHD - 3.4%

Figure 1. Percent prevalence of ADHD medication use in children and adolescents (0–19 years) in youth cohorts from five countries, 2005/6–2012. Adapted from Bachmann et al. (2017).

Figure 2. Overall annual prevalence of attention deficit hyperactivity disorder medication use in children aged 3–18 years. Adapted from Raman et al. (2018).
**The Integrated Data Infrastructure**

**Data Source:** Statistics New Zealand Integrated Data Infrastructure (IDI)
- Large database of de-identified administrative and survey data.
- Linked at the individual level
- Can connect information about a person across different sources
The Integrated Data Infrastructure

1. Safe people
2. Safe projects
3. Safe settings
4. Safe data
5. Safe output

Source: Statistics New Zealand
ADHD medication in NZ

Obtained from the community pharmaceutical collection.

Methylphenidate hydrochloride
Dexamphetamine sulfate
Atomoxetine
Modafinil
Clonidine
ADHD medication in NZ

Sample: All individuals in NZ aged 1 – 24 years from 1st July 2007 – 30th June 2017
  ◦ N = 2,395,209

Data analysis: Dispensing prevalence for each fiscal year

\[
\frac{\text{Number with one or more dispensing}}{\text{Total number in resident youth population}} \times 100,000
\]

Prevalence also calculated for each sex, age group, ethnicity (total response), 2013 NZDep quintile, and DHB.
Total population dispensing prevalence

Period prevalence was 1,182 per 100,000 population

Fiscal year

<table>
<thead>
<tr>
<th>Year</th>
<th>Rate per 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007/08</td>
<td>516</td>
</tr>
<tr>
<td>2008/09</td>
<td>566</td>
</tr>
<tr>
<td>2009/10</td>
<td>617</td>
</tr>
<tr>
<td>2010/11</td>
<td>652</td>
</tr>
<tr>
<td>2011/12</td>
<td>708</td>
</tr>
<tr>
<td>2012/13</td>
<td>780</td>
</tr>
<tr>
<td>2013/14</td>
<td>826</td>
</tr>
<tr>
<td>2014/15</td>
<td>876</td>
</tr>
<tr>
<td>2015/16</td>
<td>928</td>
</tr>
<tr>
<td>2016/17</td>
<td>996</td>
</tr>
</tbody>
</table>
Dispensing prevalence by sex

Rate per 100,000

Fiscal year

Male
Female
Dispensing prevalence by age

![Dispensing prevalence by age graph]

- **Rate per 100,000**
- **Fiscal year**: 2007/08 to 2016/17
- **Age groups**:
  - 1-6yrs
  - 7-12yrs
  - 13-17yrs
  - 18-24yrs

The graph shows the increasing trend of dispensing prevalence across different age groups over the fiscal years from 2007/08 to 2016/17.
Dispensing prevalence by ethnicity
Dispensing prevalence by deprivation
Dispensing prevalence by DHB

[Graph showing dispensing prevalence by DHB from 2007/08 to 2016/17 for various regions including Auckland, Hawke's Bay, Northland, Waikato, and others. The x-axis represents fiscal years from 2007/08 to 2016/17, while the y-axis represents rate per 100,000.]
Dispensing prevalence by DHB

![Dispensing prevalence by DHB](image_url)
## Prevalence by medication type (per 100,000)

<table>
<thead>
<tr>
<th>Fiscal year</th>
<th>Methylphenidate</th>
<th>Clonidine</th>
<th>Dexamphetamine</th>
<th>Atomoxetine</th>
<th>Modafinil</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007/08</td>
<td>462</td>
<td>50</td>
<td>36</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>2008/09</td>
<td>507</td>
<td>51</td>
<td>33</td>
<td>12</td>
<td>&lt;1</td>
</tr>
<tr>
<td>2009/10</td>
<td>555</td>
<td>50</td>
<td>28</td>
<td>28</td>
<td>&lt;1</td>
</tr>
<tr>
<td>2010/11</td>
<td>586</td>
<td>52</td>
<td>26</td>
<td>28</td>
<td>&lt;1</td>
</tr>
<tr>
<td>2011/12</td>
<td>638</td>
<td>57</td>
<td>28</td>
<td>31</td>
<td>1</td>
</tr>
<tr>
<td>2012/13</td>
<td>703</td>
<td>66</td>
<td>29</td>
<td>35</td>
<td>1</td>
</tr>
<tr>
<td>2013/14</td>
<td>744</td>
<td>70</td>
<td>30</td>
<td>37</td>
<td>1</td>
</tr>
<tr>
<td>2014/15</td>
<td>790</td>
<td>79</td>
<td>32</td>
<td>39</td>
<td>1</td>
</tr>
<tr>
<td>2015/16</td>
<td>834</td>
<td>89</td>
<td>31</td>
<td>42</td>
<td>1</td>
</tr>
<tr>
<td>2016/17</td>
<td>899</td>
<td>98</td>
<td>34</td>
<td>46</td>
<td>1</td>
</tr>
</tbody>
</table>
Comparison to other regions

Overall prevalence in ADHD medication dispensing was 1.18% (95% CI 1.17 – 1.20)

<table>
<thead>
<tr>
<th>Region</th>
<th>Prevalence (%)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia and Australia</td>
<td>0.95</td>
<td>0.35–1.56</td>
</tr>
<tr>
<td>North America</td>
<td>4.48</td>
<td>2.86–6.10</td>
</tr>
<tr>
<td>Northern Europe (Nordic countries)</td>
<td>1.95</td>
<td>1.47–2.44</td>
</tr>
<tr>
<td>Western Europe (France, Spain, UK)</td>
<td>0.70</td>
<td>0.31–1.10</td>
</tr>
</tbody>
</table>

*Table 1.* Prevalence (95% CI) in ADHD medication dispensing. Adapted from Raman et al. (2018)
Comparison with disorder prevalence

Polanczyk and colleagues

- Worldwide-pooled prevalence of ADHD – 3.4%
- Variability in ADHD prevalence estimates explained by methodological factors
- No evidence that ADHD prevalence is increasing
Comparison with disorder prevalence in NZ Health Survey (2016/17)


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Comparison with antidepressant dispensing

Bowden et al. (under review) – from 2006/07 to 2015/16

**Antidepressants**
- **2015/16:** 2,777 per 100,000
- 49% relative increase

**ADHD medication**
- **2015/16:** 928 per 100,000
- 79% relative increase (92% to 2016/17)
Comparison with antidepressant dispensing
Comparison with antidepressant dispensing

Antidepressants

ADHD medication
Concluding thoughts

- Increase in dispensing prevalence rates from 2007/08 to 2016/17
- Medication dispensing prevalence lower than disorder prevalence
- Differences across DHBs in dispensing prevalence
- Group differences in rates may reflect differences in access to healthcare and medication
  - Ethnicity: cultural variation in the perception of ADHD and treatment
  - Sex and age: genuine differences in prevalence of ADHD in these groups
Limitations

- Dispensings not prescriptions
- Medications may be prescribed for other conditions
- Lack of information on other treatments
- IDI not sufficient in exploring reasons for discrepancies in dispensing prevalence rates
Acknowledgements

- COMPASS team
- Better Start team
- Public Policy Institute
- Stats NZ
Questions
## Attention-deficit/hyperactivity disorder

<table>
<thead>
<tr>
<th>Inattention symptoms</th>
<th>Hyperactivity/Impulsivity symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fails to give close attention to details or makes careless mistakes.</td>
<td>Fidgets with or taps hands or feet, or squirms in seat.</td>
</tr>
<tr>
<td>Has trouble holding attention.</td>
<td>Leaves seat in situations when remaining seated is expected.</td>
</tr>
<tr>
<td>Does not seem to listen when spoken to directly.</td>
<td>Inappropriately runs about or climbs (adolescents or adults may be limited to feeling restless).</td>
</tr>
<tr>
<td>Does not follow through on instructions and fails to finish tasks.</td>
<td>Unable to play or take part in leisure activities quietly.</td>
</tr>
<tr>
<td>Has trouble organizing tasks and activities.</td>
<td>“On the go” acting as if “driven by a motor”.</td>
</tr>
<tr>
<td>Avoids, dislikes, or is reluctant to do tasks that require mental effort over a long period of time.</td>
<td>Talks excessively.</td>
</tr>
<tr>
<td>Loses things necessary for tasks and activities.</td>
<td>Bursts out an answer before a question has been completed.</td>
</tr>
<tr>
<td>Easily distracted.</td>
<td>Trouble waiting his/her turn.</td>
</tr>
<tr>
<td>Forgetful in daily activities.</td>
<td>Interrupts or intrudes on others.</td>
</tr>
</tbody>
</table>


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