Isomers of THC

Section 5: Epidemiology
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1. Epidemiology

Of the 95 studies relevant to THC, one study analyzed changes in potency of cannabis in the United States between 1995 and 2014 by both $\Delta^9$-THC and $\Delta^8$-THC content (8). Prior to 2009, $\Delta^8$-THC was not detected in cannabis seizures in the United States; a gradual increase in $\Delta^8$-THC was observed from 0.01% to 0.07% in 2014 (8). Compared to $\Delta^9$-THC, $\Delta^8$-THC content was lower by a factor of 10 and increasing potency of $\Delta^8$-THC did not appear to impact $\Delta^9$-THC concentrations (8)

2. Industrial use

No data available

3. Therapeutic use

No data available

4. Non-medicinal use, abuse, dependence

No data available

5. Nature and magnitude of the public health problems related to misuse, abuse, and dependence

No data available

6. Licit production, consumption, and international trade

No data available

7. Illicit manufacture and traffic

No data available
8. References

Appendix 1: Search Strategy for isomers of THC
Following databases were searched using OVID on March 8, 2018:
1. Embase
2. Medline
3. PsycINFO

The search strategy (Table 1) was the same as for report 3, but for report 4, we further selected all articles which contained specific information on isomers (for a list of isomers see Table 2).

8.1.1 Table 1: Search strategy for Reports 3 and 4

<table>
<thead>
<tr>
<th>No.</th>
<th>Searches</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Human/ or humans/</td>
<td>36244807</td>
</tr>
<tr>
<td>2</td>
<td>limit 1 to yr=&quot;2000 -Current&quot;</td>
<td>21066974</td>
</tr>
<tr>
<td>3</td>
<td>(bibliography or case reports or clinical conference or conference abstract or conference paper or conference proceeding or &quot;conference review&quot; or comment or editorial or in vitro or letter).pt.</td>
<td>8530671</td>
</tr>
<tr>
<td>4</td>
<td>2 not 3</td>
<td>16300231</td>
</tr>
<tr>
<td>5</td>
<td>epidemiology or exp epidemiology/</td>
<td>3693795</td>
</tr>
<tr>
<td>6</td>
<td>prevalence or exp prevalence/</td>
<td>1580556</td>
</tr>
<tr>
<td>7</td>
<td>incidence or exp incidence/</td>
<td>1888341</td>
</tr>
<tr>
<td>8</td>
<td>population or exp population/</td>
<td>3537733</td>
</tr>
<tr>
<td>9</td>
<td>5 or 6 or 7 or 8</td>
<td>8094152</td>
</tr>
<tr>
<td>10</td>
<td>delta-9-tetrahydrocannabinol</td>
<td>6047</td>
</tr>
<tr>
<td>11</td>
<td>tetrahydrocannabinol or THC</td>
<td>25380</td>
</tr>
<tr>
<td>12</td>
<td>dronabinol or exp dronabinol/</td>
<td>13589</td>
</tr>
<tr>
<td>13</td>
<td>10 or 11 or 12</td>
<td>29610</td>
</tr>
<tr>
<td>14</td>
<td>4 and 9 and 13</td>
<td>1331</td>
</tr>
<tr>
<td>15</td>
<td>remove duplicates from 14</td>
<td>1055</td>
</tr>
</tbody>
</table>
8.1.2 Figure 1: PRISMA Diagram for Reports 3 and 4 (4)
### 8.1.3 Table 2: IUPAC and trivial names of THC isomers

<table>
<thead>
<tr>
<th>IUPAC name</th>
<th>Trivial name</th>
</tr>
</thead>
<tbody>
<tr>
<td>7,8,9,10-tetrahydro-6,6,9-trimethyl-3-pentyl-6H-dibenzo[b,d] pyran-1-ol</td>
<td>Δ-6a, 10a-tetrahydrocannabinol</td>
</tr>
<tr>
<td>(9R,10aR)-8,9,10,10a-tetrahydro-6,6,9-trimethyl-3-pentyl-6H-dibenzo[b,d]pyran-1-ol</td>
<td>Δ-6a(7)-tetrahydrocannabinol</td>
</tr>
<tr>
<td>(6aR,9R,10aR)-6a,9,10,10a-tetrahydro-6,6,9-trimethyl-3-pentyl-6H-dibenzo[b,d]pyran-1-ol</td>
<td>Δ-7-tetrahydrocannabinol</td>
</tr>
<tr>
<td>(6aR,10aR)-6a,7,10,10a-tetrahydro-6,6,9-trimethyl-3-pentyl-6H-dibenzo[b,d]pyran-1-ol</td>
<td>Δ-8-tetrahydrocannabinol</td>
</tr>
<tr>
<td>6a,7,8,9-tetrahydro-6,6,9-trimethyl-3-pentyl-6H-dibenzo[b,d] pyran-1-ol</td>
<td>Δ10-Tetrahydrocannabinol</td>
</tr>
<tr>
<td>(6aR,10aR)-6a,7,8,9,10a-hexahydro-6,6-dimethyl-9-methylene-3-pentyl-6Hdibenzo[b,d]pyran1-ol</td>
<td>Δ-9(11)-tetrahydrocannabinol</td>
</tr>
</tbody>
</table>

Trivial names from: (5)

Of 1055 studies retrieved from the search, 179 were included after screening of title and abstract (see Appendix 1 for Reports 3 and 4 for details). After full-text screening, 95 studies were ultimately included as relevant to THC.

Few articles focused on isomers of THC. The majority of articles retrieved in this search relevant to THC isomers were pharmacological and animal studies.

One study explored the different effects of smoking THC isomers and homologues, but only reported on Δ⁹-THC and Δ³-THC; the latter is not relevant to this report (6). Another study found the different structures of THC isomers to affect potency; Δ⁸-THC is reportedly extremely potent as defined by its affinity for the cannabinoid receptor measured by a competitive binding assay (7). Strictly relevant for epidemiology was only one study on increasing and Δ⁸-THC concentrations (8).