Unintended consequences of a cautious approach to e-cigarette laws

In reply: We thank Mendelsohn and Wodak for their comment on our letter.[1]

Although we acknowledge that there is a range of reported lethal nicotine doses in humans ranging from 0.5 mg/kg to 13 mg/kg,[2,3] the value of 60 mg stated in our original letter is used in numerous studies and in toxicology textbooks.[4,5] There have been documented paediatric deaths from accidental nicotine ingestion,[6] with some articles suggesting that the lethal dose in a child may be as low as 10 mg.[7] Of note, one case report described a lethal dose of 4.2 mg/kg in a 15-month old child. Despite vomiting immediately after the ingestion, there was rapid progression to cardiac arrest and hypoxic brain injury.[8] Therefore, with the risk of significant morbidity and mortality, a conservative approach to an accidental ingestion is needed.

Even if a lethal dose of 500 mg is applied — equating to about 8 mg/kg per dose in an adult with a weight of 70 kg — the volume of nicotine required to produce a lethal dose in a child would still be significantly smaller. With the reported nicotine concentrations in electronic nicotine delivery systems (ENDS) ranging from 0 mg/mL to 36 mg/mL,[3] the ingestion of only 5 mL (one teaspoon) of a solution with a concentration of 18 mg/mL would be needed to produce a potentially lethal dose in a child who weighs 10 kg.

We advocate for the safe labelling and childproof packaging of ENDS products in Australia to prevent deaths from accidental ingestion. The fact remains that even a small amount of ingested liquid nicotine has the potential to cause serious harm to a child, at a time when ENDS products are both widely available and, at this point, unregulated.

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Competing interests: No relevant disclosures. ■

doi: 10.5694/mja2.50278

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