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E-CIGARETTE REGULATION AND COMPLIANCE IN NEW SOUTH WALES

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The NSW Poisons Information Centre has prepared a surveillance report for NSW Health on vaping and e-cigarette products based on calls to the NSW Poisons Information Centre (attached). This report summaries the information available from the NSW Poisons Information Centre on the health effects of vaping and e-cigarettes, as evidenced through calls to the service. E-cigarette and Vaping-induced Lung Injury (EVALI) has been reported in Australia, please find attached the published case report.

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AUSVAPESAFETY NSW 2022 SURVEILLANCE REPORT – CALLS TO NSW POISONS INFORMATION CENTRE
MARCH 2023

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Introduction

Vape use is increasing in the Australian population(1), along with concerns about subsequent possible harms(2). Vapes are battery-operated devices containing a liquid (e-liquid) which is heated to form an aerosol that individuals inhale(3). As this e-liquid often contains nicotine along with other substances of variable and/or unknown toxicity(4), risks from vapes include nicotine toxicity (especially with e-liquid ingestion), E-cigarette and vaping-product associated lung injury (EVALI) along with other emerging adverse effects(4-6).

Surveillance of vape products and potential harms is particularly important given changing patterns of use and a relatively newer product market(7). In addition, it is valuable to assess the impact of regulatory changes, such as the October 2021 change to restrictions to allow personal importation of nicotine-containing vapes with a prescription(8). Given our role as a central source of advice on poisonings for both the NSW public and health professionals, the NSW Poisons Information Centre (PIC) is well positioned to contribute to this surveillance. This includes obtaining detailed data on exposures including the products involved, the circumstances around exposure and the resulting clinical effects.

As such, our aims are to

1) Examine the products involved in e-cigarette poisoning exposures and patient outcomes in New South Wales (NSW).
2) Pilot a clinical monitoring system for ongoing pharmacovigilance for e-cigarettes.

Methods

Case definition

We examined all calls from NSW to the NSW Poisons Information Centre relating to exposures to any vape-related substances or products 1 January – 31 December 2022.

Ethics

Case follow-up is part of international PIC best practice and is performed where resources are available for priority call types. Use of data for research is covered by Sydney Children's Hospitals Network Human Research Ethics Committee - HREC Reference: 2021/ETH00165 (Australian Drug Intoxication and Treatment (AuDIT) Program of Research). Callers from the community were informed of the planned follow-up during their call to NSW PIC.

Data collection

At the time of the initial call, PIC Specialists in Poisons Information (SPIs) collected data relating to the product, source, circumstances around exposure and clinical effects, using a standardised form. At this time, photos of the involved product/s were also requested. Where calls were received from the patient or relative (i.e. not a health practitioner), we conducted a follow up call to obtain information about clinical progression, and any product and exposure details that were not available at the time of the initial call. When the caller could not be reached, we sent an online survey link via SMS using the number provided by the caller. Callers in the community were not followed up if they declined when explicitly invited, did not provide a phone number or provided an invalid number, were assessed as unsuitable based on aggressive-type phone behaviour, and where the exposure involved deliberate self-poisoning or where effects described were determined to be unrelated and involved indirect inhalational exposure.

For cases that presented to hospital, we reviewed the electronic medical record to obtain further information regarding the treatment and clinical outcome. For cases that were referred to the NSW Ambulance service but did not present to hospital, we reviewed the ambulance record.

Data extraction and analysis

We extracted data to a form in REDCap (Research Electronic Data Capture). We generated descriptive statistics of the data using Microsoft Excel. When clinical symptoms were clearly attributed to a non-vaping aetiology by the treating clinicians, these cases were excluded from the analysis of clinical effects, but the principal diagnoses are provided.

Results

During 2022, the NSW Poisons Information Centre received 254 calls from NSW relating to 255 patients (Figure 1). This represents a small increase in call volumes seen in 2021 (Table 1).

Figure 1. Number of calls to NSW PIC from NSW regarding vape exposures by month.

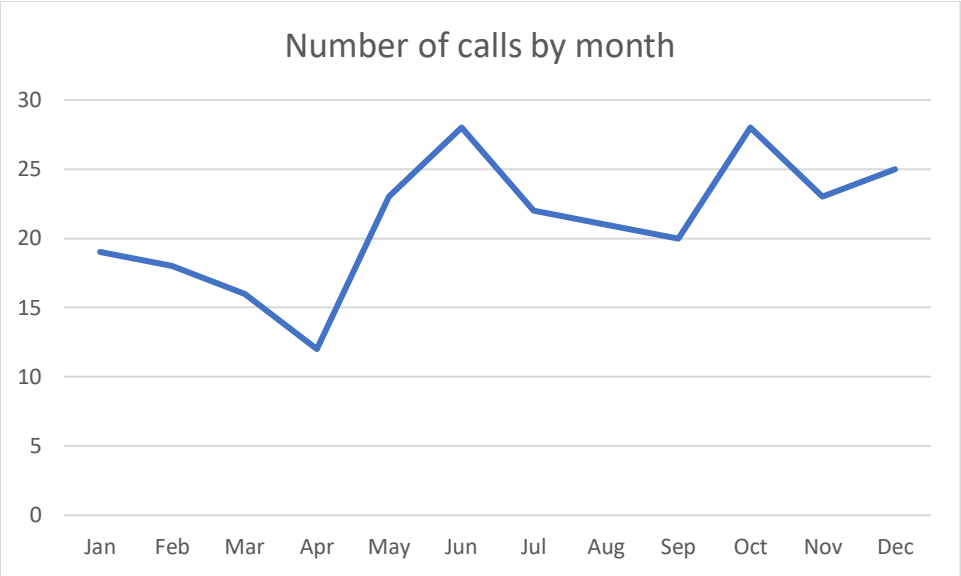

Table 1. Annual counts of cases consulted to NSW PIC from NSW, 1 January 2014 – 31 December 2022.

Year	Number of cases
2014	1
2015	5
2016	24
2017	30
2018	23
2019	52
2020	82
2021	205
2022	254

The majority of calls were from members of the public (87%), such as the patient themselves, a relative or a friend. Of the remaining calls from health professionals, 63% were from emergency department doctors, 19% from nurses, 9% from paramedics, 6% from general practitioners and 3% from a paediatric retrieval service) (Table 2). We attempted follow up calls from all eligible non-health professional callers (196 calls from the total 254 calls), and successfully reached 130 of the 196 eligible calls. All callers who were not successfully reached were sent a survey to complete via text, with 13 of these 66 completing the survey.

Table 2. Calls to NSW PIC about vape exposures broken down by caller role.

Caller role	Number of calls
Health practitioner	
ED doctor	20
Nurse	6
Paramedic	3
GP	2
Paediatric retrieval service	1
General public	
Family member	176
Self	40
Friend	5
Carer (excluding group home)	1
Group home	1
Total calls	**255**

Demographic data

The majority of patients were male (58%). While patients spanned all age groups except the elderly, the majority were toddlers (64%) (Table 3). Caller location information was available for 204 cases, with the most common Local Health Districts (LHD) being South Western Sydney (16%), Hunter New England (14%), Western Sydney (12%) and South Eastern Sydney (11%) (Table 4).

Table 3. Demographic data in calls to NSWPIC about vape exposures.

Characteristic		Male	Female	Total N (%)
Age (category)	Infant (4 weeks to 1 year)	8	10	18 (7%)
	Toddler (1 to 4 years)	94	70	164 (64%)
	Child (5 to 14 years)	8	5	13 (5%)
	Adolescent (15 to 19 years)	3	2	5 (2%)
	Adult (20 to 74 years)	34	20	54 (21%)
	Unknown	0	1	1 (0.4%)
Total		147	108	255

Table 4. Calls to NSW PIC about vape exposures broken down by Local Health District of caller.

Local Health District (LHD)	Number of calls (%)	Rate of calls per 100,000 population[1]
South Western Sydney	32 (16%)	3.0
Hunter New England	28 (14%)	2.9
Western Sydney	24 (12%)	2.2
South Eastern Sydney	23 (11%)	2.4
Sydney	18 (9%)	2.5
Central Coast	16 (8%)	4.5
Nepean Blue Mountains	15 (7%)	3.9
Illawarra Shoalhaven	12 (6%)	2.8
Northern NSW	9 (4%)	2.9
Northern Sydney	8 (4%)	0.8
Murrumbidgee	5 (2%)	2.0
Mid North Coast	4 (2%)	1.8
Southern NSW	4 (2%)	1.8
Western NSW	4 (2%)	1.4
Far Western NSW	1 (0.5%)	3.3
Albury Wodonga Health (Victoria)	1 (0.5%)	1.8
Total number of cases where location data was available	**204**	

[1]Based on NSW Department of Planning 2016 projections of 2021 population(9)

The projected Albury Wodonga Health population only includes Albury Local Government Area, not the Victorian population of Albury Wodonga Health.

Vaping products

Product type

The majority of products implicated in exposures were vape devices (86% of 216 cases where the product was known), and where the specific type of vape device was known, disposable vapes were far more common than refillable vapes (96% vs 4% respectively). Refill liquid was involved in 14% of exposures (Table 5).

Table 5. Types of products involved in calls to NSW PIC regarding vape exposures.

Product type		Number of related exposures
Vape device		186
	Disposable vape	174
	Refillable vape	8
	Unknown	4
Refill liquid		30
Unknown		39
Total exposures where involved product known		**216**
Total exposures		**255**

Brand information

Brand information was obtained in 188 cases. The most common brands were IGET (63% of known cases), Gunnpod (15% of cases) and HQD (8% of cases). For vape devices with volume data (n=121),

volumes ranged from 3ml to 14ml (median 12ml); for refillable pods (n=4), volumes ranged from 1.9-5.5ml (median 2ml) and for refill liquids (n=20), container volumes ranged from 10ml to 1000ml (median 162.5ml).

Nicotine concentration

71% of exposures were known to involve nicotine-containing devices or liquids, with nicotine status unknown in 24% of cases and no nicotine in 5% of cases. Where a specific nicotine-containing product could be identified, information about the nicotine concentration was reported as clearly available on outer packaging only in 17% of cases, with information available online in 77% of cases. For vape devices, nicotine concentration was most commonly 50mg/ml (median 50mg/ml, interquartile range 50-50mg/ml, range 0-60mg/ml) – such devices made up 81% of vape devices with a known nicotine concentration (n=126). For refill liquids, nicotine concentration was most commonly 100mg/ml (median 75mg/ml, interquartile range 14-100mg/ml, range 0-200mg/ml) – these devices made up 45% of refill liquids with a known nicotine concentration (n=22).

There were no cases of psychoactive substances other than nicotine present in the vape products reported in any calls. However, a post hoc audit of calls identified a single case not included in our cohort of an adult male who took a single puff of hemp oil he had loaded into a vape device.

Flavour types

While flavour data was unknown in 33% of exposures, when known, disposable vape devices all contained flavoured liquids, whereas refill liquid exposures were more often (67%) unflavoured. The most popular flavours were:

- fruit-based[1] (83% of reported flavours);
- energy drink-flavoured (3%);
- lolly-flavoured (2%);
- cola-flavoured (1%);
- lemonade-flavoured (1%); and
- cigarette-flavoured (1%).

Safety features

Reported safety features included:

- Child-resistant closure for their products (n=12)
- Flow restrictor (n=3)
- Button mechanism to turn the device on and off (n=3)
- Complex mechanism to open the vape (n=1)
- Sealed/enclosed nature of their disposable vape devices was reported as a safety feature (n=11).

There were no reported safety features in 109 cases (43%) and this data was unknown in the remaining cases.

[1] Fruit flavours included apple, banana, blackberry, blueberry, cherry, grape, guava, kiwi, lemon, lime, lychee, mango, melon, orange, papaya, passionfruit, peach, pineapple, pomegranate, raspberry, strawberry, watermelon and/or combinations of the above.

Sources

While the source of purchase was unknown in 49% of exposures, when known, vapes were most commonly obtained from tobacconists (50% of cases where source was known), overseas-based websites (11%) and service stations (11%) (Table 6). The vast majority were not prescribed (91% of cases where prescription status was known). For toddler and child exposures, the vape device or liquid usually belonged to a family member (74% of cases where vape owner was known); for adolescents and adult exposures, the vape device or liquid usually belonged to the patient (68%).

Table 6. Source of vape products in calls to NSW PIC about vape exposures.

Source of vape product		Number of related exposures
Online		
	Local website	7
	Overseas website	15
	Unknown whether local or overseas website	4
Tobacconist		66
Service station		15
Convenience store		10
Other retail		9
Pharmacy		0
Other		5
Unknown		124
Total exposures where source known		**131**
Total exposures		**255**

Circumstances around exposure

The majority of exposures occurred in the home (84% of cases where place of exposure was known). While this data was not routinely collected, notable vape product locations included the fridge or freezer where the e-liquid leaked onto other foods (n=3), under the sofa (n=1), having fallen out of a friend or family member's pocket (n=4) or having been left in a public place by a stranger (n=3). The most common routes of exposure were inhalation (73%), ingestion (21%) or dermal exposure (4%). While most effects were suspected due to vape liquid exposure, one case involved suspected battery malfunction. In infants, toddlers and children, the majority of exposures were accidental (96%), while the majority of exposures in adolescents and adults were due to either accidental exposure (45%) or recreational use[2] (25%). Some exposures in adults were initially reported as possible deliberate self-poisoning (n=3); although one case was lost to follow up, in the remaining two cases further medical and psychiatric review determined that nicotine ingestion had not actually occurred.

[2] An exposure resulting from the intentional use of a substance where the patient was likely attempting to gain a high, euphoric effect or some other psychotropic effect, including recreational use of a substance for any effect.

Clinical effects

Overall, most exposures were associated with mild severity or no effects by the Poisoning Severity Score(10):

- No effects: 71 calls (28%)
- Mild severity: 172 calls (67%)
- Moderate severity: 6 calls (2%)
- Severe severity: 1 call (<1%)
- Unknown severity: 5 calls (2%)

The most common reported adverse effects were cough (n=116), nausea/vomiting (n=35) and local irritation (n=15). More significant reported symptoms included drowsiness/decreased level of consciousness (n=11), chest pain (n=9) and seizure (n=4) (Table 7).

Table 7. Clinical effects described in calls to NSW PIC about vape exposures.[3]

Symptom	Number of exposures with the sign/symptom
Respiratory	
Cough	116
Dyspnoea	11
Choking	4
Wheeze	2
Perioral cyanosis	1
Rhinorrhoea	1
Gastrointestinal	
Vomiting	24
Nausea (without vomiting)	11
Abdominal pain	6
Diarrhoea	2
Neurological	
Drowsiness/decreased level of consciousness	11
Headache	7
Seizure	4
Tremor	4
Hypotonia	2
Jitteriness/restlessness	2
Blurry vision	1
Urinary/faecal incontinence	1
Irritability	1
Muscle twitching	1
Paraesthesia	1
Tinnitus	1
Vertigo	1
Weakness	1
Cardiovascular	
Chest pain	9
Tachycardia/racing heart	7
Bradycardia	1

[3] Callers can have one or more of the symptoms above.

Palpitations	1
Hypotension	1
Syncope	1
Other	
Local irritation	15
Dizziness/lightheadedness	12
Pallor	9
Chills	5
Subjective fever	2
Flushing	1
Diaphoresis	3
Sialorrhoea	4
Acid-base disturbances	1
Electrolyte disturbances	1
Dry mouth	1
Skin irritation/oedema	1

Ten cases were subsequently excluded from the analysis of clinical effects due to the treating clinicians either clarifying that there had been no acute exposure to vape products or attributing the symptoms to another cause.

- Two cases involved adults who initially reported deliberate self-poisoning with nicotine liquid, but later denied this and did not develop clinical features of nicotine toxicity.
- A boy with chronic vape use presented with possible chest pain, drowsiness and ataxia which was attributed to alcohol toxicity.
- An adolescent with chronic vape use presented with respiratory distress requiring intubation and was ultimately diagnosed with pulmonary haemorrhage and post-infectious glomerulonephritis.
- An adolescent with chronic vape use developed headache, intermittent dizziness, blurry vision and feeling 'spaced out' which was attributed to her preexisting venous malformation.
- An adult with chronic vape use developed insomnia, anxiety and shakes after using cocaine, MDMA (3,4-methylenedioxymethamphetamine; ecstasy), dexamphetamine, nitrous oxide, methamphetamine and vaping, and their symptoms were attributed to polydrug use.
- An adult developed chest pain and palpitations after ingestion of clenbuterol, caffeine and colchicine, vaping, and smoking marijuana, and their symptoms were attributed to the effects of clenbuterol and/or caffeine.
- An adult presented with abdominal pain, nausea and possible seizure and their symptoms were attributed to their deliberate self-poisoning with mefenamic acid.
- An adult had 3 presentations for persistent chest pain with a history of vaping and was diagnosed with pericarditis.
- An adult had lightheadedness, shortness of breath, pruritis and sensory disturbances ('hallucinating a bit') with no medical concerns on ambulance assessment and their symptoms were suspected to be mental health-related.
- An adult developed dizziness, racing heart, headache and diaphoresis which was attributed to alcohol toxicity.

Disposition

In addition to the 27 calls from hospital, 45 other cases were referred to hospital, with 31 total cases confirmed to have presented to hospital. In hospital, all were monitored for minimum 4 hours post-exposure, with 5 patients requiring medical admission for exposure-related monitoring or treatment, one of whom was admitted to the intensive care unit (discussed in Appendix 1).

Of the remaining calls from home, 175 calls were advised to stay at home with monitoring of symptoms, 2 calls were referred for GP assessment, 2 calls from ambulance officers pre-arrival were advised to assess on site and call back for further advice, and 2 calls were of unknown disposition.

Discussion

Summary of findings

This review of NSW Poisons Information Centre calls during 2022 demonstrates calls regarding vape devices and liquids are common, most frequently due to acute accidental exposures in young children, followed by accidental exposures and then chronic recreational use in adolescents and adults. While the most commonly implicated devices were disposable vapes, calls regarding refill liquid ingestion caused clinically significant effects (such as coma), reflecting that the population group using refillable vapes are also of concern. Overall, there were a range of clinical effects, which were most commonly mild; however, significant effects reported included chest pain, seizure and drowsiness/decreased level of consciousness.

The clinical implications of our findings include:

- clinicians should be aware of the broad spectrum of signs and symptoms of vaping, and that vaping-induced illnesses should be considered in the differential diagnoses in people who vape
- age groups from infancy to adulthood can be affected
- labelling can be unreliable
- ingestions can be potentially life-threatening
- the utility of laboratory testing to assess for nicotine toxicity.

Demographic trends

Demographically, an unexpected finding was the large proportion of calls regarding young children. While this trend was affected by the lower threshold for concern for parents to call about their children compared to adults calling about themselves, it also reflects a secondary population affected by rising rates of vape use. This younger population is more susceptible to the effects of nicotine-containing e-liquid(6) and generally there are less data on the effects of other substances that may be present in e-liquids(11, 12). The overall risk to this group is increased by the progressive ubiquity of vape devices, as demonstrated by the reports of vape devices being left by strangers and found in public places such as parks and a vacation home. While many clinical histories usually reflected an appropriate level of supervision for the child's developmental stage and appropriate parental concern about the risks with exposure to the vape device, a common issue was that parents did not recognise the accessibility of the devices, and the ease with which their children could use the device and be exposed, prior to the exposure occurring.

Conversely, while rates of vape use amongst adolescents are rising(13), this population represented a small proportion of callers. While their pattern of exposures was similar to adults, unlike adults, no adolescents called PIC about themselves – all calls to PIC about adolescents were from parents or healthcare professionals. While this may have been due to the low absolute number of calls for

adolescents it may also reflect the still-developing health literacy and self-efficacy found in this population and the often covert nature of adolescent vape use(14, 15). These barriers to accessing healthcare may be addressed through including Poisons Information Centre details in school-based vaping education, broader health promotion material targeting adolescents, and provision of other access options such as web-based chat.

Involved products and associated concerns

Our analysis of involved vape products demonstrated a significant predominance of disposable vaping devices compared to refillable vapes, with implications on safety regulations, as disposable and refillable vapes have different device-related safety risks. Disposable vapes were less likely to have 'on-off' buttons or complex child-safe mechanisms for use. However, ingestion of nicotine-containing e-liquid is of higher risk than inhalation(16), and unlike refillable vapes, disposable vapes do not require the user to have access to bulk e-liquid, so using disposable vapes may limit the prevalence of large volume containers of e-liquid in the community, thereby limiting the possibility of high-risk accidental or deliberate ingestion from the container. However, some callers reported concern that their disposable vape had leaked e-liquid, so their use does not remove concerns about e-liquid ingestion from disposable vapes.

Currently, nicotine-containing vaping products may only be obtained legally with a prescription, either from pharmacies or importation from overseas(8). In NSW, it is illegal for non-pharmacy retailers to sell vaping products that contain nicotine(17). Despite this, the vast majority of products we encountered were bought without a prescription and/or bought from local non-pharmacy retailers, suggesting poor compliance with the current regulatory framework.

Implications of clinical severity results

While the majority of accidental ingestions resulted in mild or no symptoms, there is significant potential for toxicity in these situations, with many such cases reflecting a 'near miss' situation. Toddlers exposed to refill liquid would require only 50-100mg to receive the potentially lethal dose of 5mg/kg stated in some references (18), which would be equivalent to 0.5-1ml of a 100mg/kg solution, the most common concentration of liquid nicotine in our sample. These high concentration nicotine liquids were stored in volumes up to 1000ml, often with unclear labelling and no safety features, further increasing the risk of a clinically significant accidental ingestion.

Furthermore, there were some cases in children of significant clinical effects associated with minimal exposures - i.e. one puff of a nicotine-containing vape. Unfortunately the variability in products and poor quality control of these products mean it is unclear whether these stories reflect inaccurate exposure histories or currently unknown adverse effects associated with one or more of the vape product contents. There is minimal experience in children with inhaled nicotine exposures (compared with ingestion) and so this may represent previously undocumented effects.

Difficulties attributing clinical symptoms to vaping

In many of our significant cases, it was difficult to definitively associate the clinical symptoms with vape use. For example, in the two cases of adolescents with seizures, samples were analysed by the Forensic & Analytical Science Service (FASS) which determined there was no detectable nicotine (or the metabolite, cotinine) in blood, making nicotine poisoning very unlikely. It was therefore unlikely that vaping had caused the seizure – the temporal association with vaping could be coincidental, could have triggered the seizure in someone with a seizure predisposition, or perhaps a different undetectable substance in the vape could have triggered the seizure(19). Similarly, we excluded

cases where symptoms were susbequently attributed by treating clinicians to a different cause. While some of these suspected alternate diagnoses – such as mental illness or polydrug use – would be consistent with reported symptoms, it can not be excluded that vaping contributed to the clinical picture.

Feasibility of NSW PIC as a clinical monitoring system

The AusVapeSafety study also functioned as a pilot pharmacovigilance monitoring system for e-cigarettes. The NSW PIC is a trusted public service fielding calls from both health practitioners and the general public which enables a wide range of exposures to be captured. A significant amount of unsolicited feedback was provided praising the availability of the service and the advice provided. Specialists in Poisons Information (SPIs) were able to incorporate the AusVapeSafety questionnaire into their call handling, with very few callers declining to answer questions. As a result, a valuable depth of data regarding products and exposure circumstances in addition to clinical symptoms was obtained, enabling analysis of trends.

One area of improvement identified with this system was a bias towards limited data collection with more clinically significant poisonings, as is also outlined below under limitations of this study. During the initial call, if the patient is identified as unwell it may not be clinically appropriate to complete some of the data collection at the risk of delaying medical care. Populations who are more likely to have clinically significant exposures, for example adolescents and adults with chronic vaping use and patients with mental health issues who undertake deliberate self-poisoning, are likely to have a higher threshold of concern before engaging with health services compared to parents of children with minimal exposures, and less likely to engage with follow up. Significantly poisoned cases that present to hospital may be managed by the internal toxicology service without PIC consultation. Some potentially significant cases were identified but lost to follow up due to incomplete personal identifiable data required to obtain the ambulance or hospital record. As a result, while the process of surveillance and follow up was generally excellent for low-severity cases, there were cases with a concerning exposure mechanism or incomplete but potentially concerning clinical history where we were unable to contact the caller (n=26) or obtain relevant medical records (n= 23).

Some possible ways to improve data collection in more severe cases would be to routinely collect intended destination hospital when SPIs refer the caller to hospital, encourage the patient to request that the paramedic and/or emergency department staff contact PIC (which would also enable provision of further advice), to provide further education to ambulance services and emergency departments about the potential risks of vaping devices and greater encouragement to escalate to PIC with any concerns.

Limitations

There are some limitations to the conclusions that can be drawn from our data.

Firstly, calls to the NSW Poisons Information Centre may not be representative of population use and complications of vaping due to differences in patterns for contacting PICs. In general, the increase in calls probably reflects the increase in overall use. The data can inform health messaging (eg safe storage around toddlers) but does not exclude risk identification in all populations (adolescents may be less likely to seek help). A high proportion of cases involving low-risk accidental exposure by children is expected due to a low threshold for parents to contact PIC, leading to a greater proportion of cases in our data with mild or no effects due to the low level of exposure. However, this is still undercounting cases occurring statewide as it is not mandatory to contact a PIC for an exposure. In addition, cases that present directly to hospitals with inpatient toxicology units

may not contact PIC, leading to these clinically significant cases being missed from our data set. Further research could be done with these datasets.

Secondly, there are some difficulties inherent in the process of data collection. During the initial call, data collection can be incomplete as the caller may not be the owner of the vape or may be reluctant to answer questions due to their focus on their or their child's clinical symptoms. The discrepancy between answers in the initial call and in the follow up call highlighted that some questions are being misunderstood by callers, particularly whether the product is prescribed, and whether the product contains nicotine. As a result, further clarifying questions were asked in the follow up call and product details checked against online information. When the caller is advised to present to hospital but PIC is not contacted by the receiving hospital, it is not possible to access the electronic medical record to complete data collection due to a lack of identifying details recorded by NSW PIC. When calls are received directly from hospital, we do not obtain patient contact details, and so can not follow up with the family regarding the exact product and source, which is information unlikely to be obtained by the hospital staff in sufficient detail at the time of the call, or documented in the medical record.

Future directions

There is scope for further research in this area, including to substantiate the contents of vape e-liquid particularly as the composition of the market changes and different and/or newer products dominate. More data is also required on the toxic effects of these components, particularly when regularly inhaled and risks in different age groups. Accessing the PIC follow up population could be an avenue for research recruitment.

Continuing to protect the public from the risk of harm from nicotine-containing vaping products requires a multi-pronged approach:

- Limiting access to nicotine-containing vaping products without a prescription and from non-pharmacy retailers.
- Limiting the attractiveness and appeal of the product design (eg removing flavourings) and mandating safety features such as child-resistant closures for containers and an on-off mechanism for vaping devices would help prevent accidental ingestions and inhalations.
- Limitations on maximum nicotine concentration and container sizes would also reduce the considerable risk of harm from the high concentration large volume products currently available to Australian consumers.
- More accurate product labelling would help patients, families and health practitioners better assess the risk of harm from exposures and provide appropriate monitoring and treatment, rather than being misled by absent labelling to inaccurately conclude the exposure to be low risk.
- Ongoing education about the risks and safe storage of vaping products is also important to address the underestimation of potential harms amongst vape product users, including those with young children.

Finally, surveillance and case ascertainment could be enhanced by expanding this clinical monitoring system to Poison Information Centres nationwide and creating a central database to enable assessment of national trends. NSW PIC data could also be augmented by using the NSW Public Health Rapid, Emergency, Disease and Syndrome Surveillance (PHREDSS) system.

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APPENDIX 1. Clinical case examples - confidential

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4 Performed under the Prescription, Recreational and Illicit Substance Evaluation (PRISE) program.

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Attachment included with submission

B Chan, A Kiss, N McIntosh, V Sheppeard & A Dawson, 'E-cigarette or vaping product use-associated lung injury in an adolescent', The Medical Journal of Australia, vol 215, issue 7, October 2021.