Sodium nitrite and sodium nitrate-related deaths in Australia 2009–2018

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ncis.org.au | ncis@ncis.org.au

National Coronial Information System

GPO Box 123, Melbourne VIC 3001
1300 395 723 (Aus only) | +61 3 9094 2303 (international)
ncis@ncis.org.au
ncis.org.au

Authorisation

This report was prepared by the National Coronial Information System (NCIS) Unit and approved by the relevant State/Chief Coroner(s).

Disclaimer

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PURPOSE

This report provides information about deaths reported to an Australian state or territory coroner. Cases were included where sodium nitrite or sodium nitrate was involved in the death. Cases were included where the death was notified to a coroner between 1 January 2009 and 31 December 2018.

Cases were included only where the coronial investigation has concluded and the case is closed on the National Coronial Information System (NCIS).

INTENDED USE OF DATA

This report is provided for [redacted] the Therapeutic Goods Administration (TGA).

The information provided in this report is intended to be provided by the TGA to the Delegate of the Secretary of the Department of Health and members of the Scheduling Advisory Committees to help inform deliberations about whether there are appropriate access restrictions to sodium nitrite as per the Scheduling delegate's final decisions.

In addition, the data may be published on the TGA website.

As a result, the data will be published in the public domain.

[redacted]

Any reproduction of this report or the data contained within it must acknowledge the NCIS as the source of the underlying data, and should be aligned with the guidelines provided by Mindframe regarding reporting of suicide.

About the recipient

The Therapeutic Goods Administration is a regulatory agency that aims to control how medicines and poisons are made available to the public.

Medicines and poisons are classified into Schedules according to the level of regulatory control over the availability of the medicine or poison required to protect public health and safety.

The Secretary of the Australian Department of Health may make decisions on the scheduling of medicines or chemicals, as well as changes to other parts and appendices of the Poisons Standard. This authority is provided under sections 52D, 52E and 52EAA of the *Therapeutic Goods Act 1989*. In practice, persons to whom the Secretary has delegated decision-making responsibility will make the decision (the 'Delegate').

Under Division 3D of Part 6 of the *Therapeutic Goods Regulations 1990*, the Delegate may refer a scheduling proposal to an expert Advisory Committee. Furthermore, under these regulations there is a requirement to publish the interim, final and the reasons for these decisions in a manner that the Secretary considers appropriate.

METHOD

The data presented in this report was obtained by conducting a search of the NCIS. The NCIS is a database containing information on deaths reported to a coroner in Australia and New Zealand. Data collection from Australian states and territories commenced on 1 July 2000 (Queensland from 1 January 2001) and from New Zealand on 1 July 2007.

For more information about the database, refer to the NCIS website

Case identification

Data was extracted on 1 February 2021 using the following criteria for case identification:

Date of notification	**=**	Between 1 January 2009 and 31 December 2018
Jurisdiction	**=**	All Australian states and territories
Case status	**=**	Closed
	AND	
Mechanism of injury	**=**	Exposure to chemical or other substance \ Poisoning by chemical or other substance \ Poisoning by other substance (not pharmaceutical)
Object or substance producing injury	**=**	Other non-pharmaceutical chemical substance \ Other non-pharmaceutical chemical substance \ Other specified non-pharmaceutical chemical substance \ "nitrite" or "nitrate"
	OR	
Cause of death (any)	**=**	"nitrite" or "nitrate"

Data analysis

A manual review was undertaken of the *Cause of death* fields of all cases in order to ensure their relevance.

The attached documentation (coronial findings, police narrative, autopsy report) of all cases were manually reviewed to determine the sodium nitrite source and the mechanism of injury (as supplied by the requester).

No further analysis other than described was carried out for the cases included in this report.

Important note: While sodium nitrite and sodium nitrate are different chemicals, both may result in toxicity by causing methaemoglobinaemia. It is possible the similarity in the terms 'sodium nitrite' and 'sodium nitrate' may result in reporting of the incorrect substance. The terms 'sodium nitrite' and 'sodium nitrate' were at times found to be

used alternately between different case documents. The NCIS Unit does not seek to comment on this variance.

LIMITATIONS

Toxicological detection of substances

Forensic testing practices vary within and between jurisdictions. Some substances may not always be routinely tested for as part of post-mortem toxicological analysis. In some circumstances, testing of certain substances may only be undertaken where specifically requested by an investigating coroner or pathologist. As a result, it is possible that the figures in this report are underestimates of the true number of deaths associated with administration of these substances. Caution is advised when interpreting these figures.

Keyword search case identification

Relevant cases were only able to be included in this report if the *Object or substance producing injury* or *Cause of death* coding contained a keyword that was searched. Reference to particular items, characteristics and other elements within coronial investigations is not standardised in terms of terminology. As a result, this may influence the identification of relevant cases.

Availability of documentation within NCIS database

The level of document attachment varies within the NCIS according to the reporting jurisdiction.

Coronial findings in relation to non-inquest cases may not contain details about the circumstances surrounding death. While best efforts are made to obtain reports for all cases on the NCIS (where relevant investigations are conducted), the proportion of report attachment varies across jurisdictions. This variation has the potential to impact the accurate identification of relevant information regarding sodium nitrite and nitrate source in this report.

For more information about document attachment, refer to the NCIS website

Only closed cases included

Only cases that are closed on the NCIS following coronial investigation are included in this report. It is possible cases of relevance may still be under coronial investigation and not included in this report.

For more information about NCIS case closure, refer to the NCIS operational statistics

Quality assessment of closed cases

The NCIS Unit conducts a quality assessment of the coding associated with closed cases. While every effort is made to quality review closed cases in a timely manner, there may be a delay between the case being closed and the completion of the quality review. It cannot be guaranteed that all cases included in this report have been quality assessed.

The NCIS Unit does not undertake quality assessment of data integrated from supplementary data sources.

For further information about data sources, coverage and limitations, refer to the NCIS explanatory notes

RESULTS

There were **17** deaths of relevance identified that were reported to an Australian state or territory coroner where sodium nitrite or sodium nitrate was involved in the death.

From January 2009 to December 2018, there were an average of **2 (1.7)** deaths of relevance identified per calendar year.

Dashes (-) indicate that no deaths were identified. In order to ensure the data is appropriately de-identified, figures below four are presented as '<4'.

The *Intent type (completion)* was coded as *intentional self-harm* for all cases identified in this report.

Statistical tables

Table 1. Sodium nitrite and sodium nitrate deaths by year of notification

Year of notification	Frequency	Percentage
2009–2016	-	-
2017	4	23.5
2018	13	76.5
Total	**17**	**100**

Table 2. Sodium nitrite and sodium nitrate deaths by jurisdiction of investigation

Jurisdiction of investigation	Frequency	Percentage
QLD	5	29.4
SA	5	29.4
ACT	<4	*Not available*
NSW	<4	*Not available*
TAS	<4	*Not available*
VIC	<4	*Not available*
NT	-	-
WA	-	-
Total	**17**	**100**

Table 3. Sodium nitrite and sodium nitrate deaths by sex of the deceased

Sex	Frequency	Percentage
Male	12	70.6
Female	5	29.4
Total	**17**	**100**

Table 4. Sodium nitrite and sodium nitrate deaths by age range of the deceased

Age range (years)	Frequency	Percentage
<21	-	-
21–30	<4	*Not available*
31–40	<4	*Not available*
41–50	<4	*Not available*
51–60	4	23.5
61–70	<4	*Not available*
71–80	5	29.4
>80	<4	*Not available*
Total	**17**	**100**

Table 5. Sodium nitrite and sodium nitrate deaths by employment status of the deceased

Employment status	Frequency	Percentage
Retired/pensioner	7	41.2
Employed	4	23.5
Other[1]	<4	*Not available*
Unlikely to be known	4	23.5
Total	**17**	**100**

Table 6. Sodium nitrite and sodium nitrate deaths by indigenous origin[2] of the deceased

Indigenous origin	Frequency	Percentage
Neither Aboriginal nor TSI	16	94.1
Unlikely to be known	<4	*Not available*
Total	**17**	**100**

Table 7. Sodium nitrite and sodium nitrate deaths by incident location type

Incident location type	Frequency	Percentage
Home or dwelling	10	58.8
Other[3]	7	41.2
Total	**17**	**100**

[1] The category of *Other* refers to employment status codes such as *unemployed, student* or *home duties*. Refer to the NCIS Data dictionary for further information about NCIS employment status codes

[2] *TSI* is used here to denote *Torres Strait Islander*

[3] The category of *Other* includes locations such as commercial areas, medical service areas and transport areas

Table 8. Sodium nitrite and sodium nitrate deaths by mechanism of injury[4]

Mechanism of injury	Frequency	Percentage
Chemical toxicity (food preparation)	4	23.5
Chemical toxicity (for agricultural/veterinary use)	<4	*Not available*
Chemical toxicity (other)	<4	*Not available*
Other	<4	*Not available*
Unknown	10	58.8
Total	**17**	**100**

[4] Specific mechanisms of injury were included at the request of the client and were determined based on a manual review of case documentation