



THE BURDEN OF POISONING IN CHILDREN HOSPITALIZED AT A TERTIARY LEVEL HOSPITAL IN SOUTH AFRICA

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INTRODUCTION

- Paediatric poisoning is a serious but preventable public health concern which has significant effects on children, their families as well as health care services ¹.
- Globally, paediatric poisoning is noted to be one of the leading causes of unintentional injuries².
- There is a paucity of data from low- and middle-income countries³.

1. Sahin S, Carman KB, Dinleyici EC. Acute poisoning in children; data of a pediatric emergency unit. *Iran J Pediatr*. 2011;21(4):479-484.

2.. Ahmed A, Hasanul MSB, Shojon M, Mahdi Hasan M, Raheem E, Hossain MS. Accidental poisoning in children: a single centre case series study in Bangladesh. *BMJ Paediatr Open*. 2022;6(1):e001541

3. WHO. World Report on Child Injury Prevention. 2008. World Health Organization, Geneva. URL: https://apps.who.int/iris/bitstream/handle/10665/43851/9789241563574_eng.pdf. Last accessed 22 August 2023

OBJECTIVES

1. To describe the epidemiology of poisoning in hospitalized children less than 14 years of age at the Chris Hani Baragwanath Academic Hospital from 1st January 2016 to 31st December 2021.
 - To describe the estimated population incidence of poisoning.
 - To describe the prevalence of poisoning in children hospitalized at the CHBAH.
 - To compare the incidence of poisoning pre- (January 2016 to February 2020) and during the COVID pandemic (March 2020 to December 2021).
 - To describe the common causes of poisoning in children hospitalized at the CHBAH.
2. To describe factors (age, gender, and type of poison) that are associated with mortality in children hospitalised with poisoning at the CHBAH.

METHODS

- Design:
 - Retrospective Descriptive Study.
- Study Population:
 - Children less than 14 years of age hospitalised at the CHBAH with a diagnosis of poisoning from 1st January 2016 to 31st December 2021.

METHODS

- VIDA electronic discharge summary database.

Variables: Age, gender, date of admission, discharge diagnoses with the corresponding ICD 10 codes.
(associated with poisoning)

- Permission was obtain to extract data from the paediatric high care admission database.

Variables: Need for ICU/ High Care admission, need for invasive ventilation and inotropic support.

METHODS

- Statistical Analysis:
 - For the analysis:
 - Poison types were categorised:
 - Alcohol, medication, organic solvents, other substances, pesticides, unspecified agents.
 - Children under 5 years of age and those aged 5 to less than 14 years.
 - Categorical data was represented as frequencies.
 - Continuous variables were represented as means and medians.
 - Regression analysis was undertaken to identify predictors of mortality and COVID-19 pandemic on poisoning.
 - Adjusted odds ratios along with corresponding 95% confidence intervals were reported.

ETHICS

- Ethics approval obtained from the University of Witwatersrand Human Research Ethics Committee
- (HREC number: M220744).

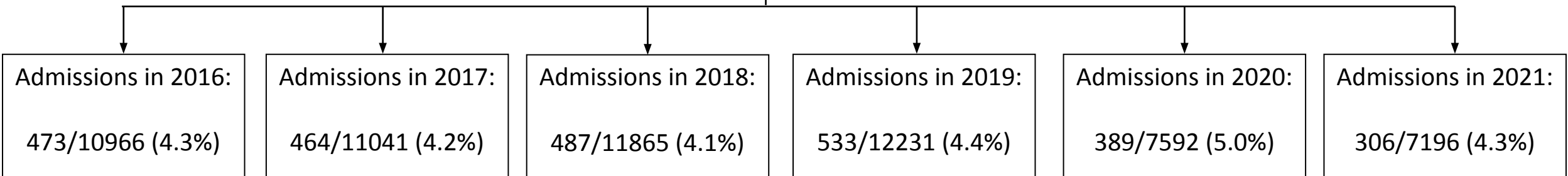
RESULTS

Total Admissions:
(January 2016-December 2021)

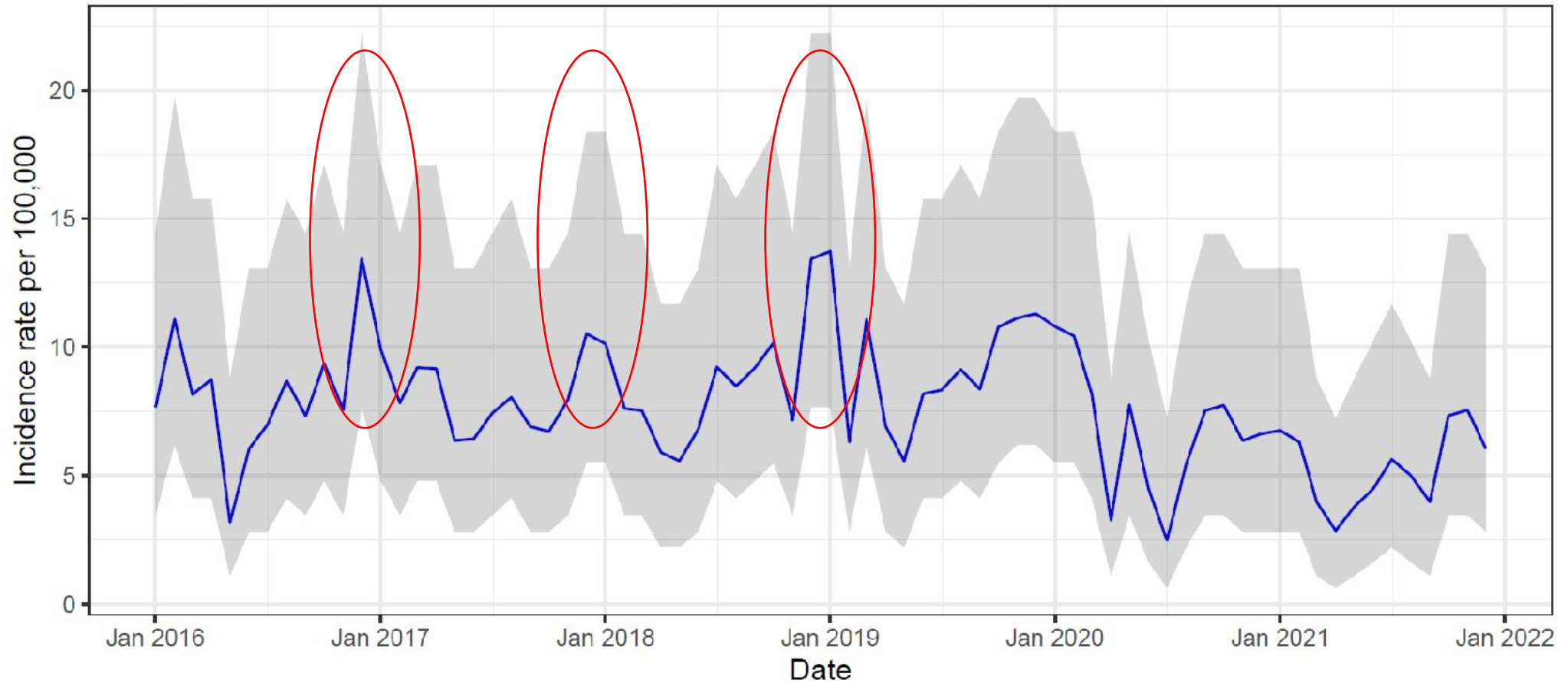
n = 60901

Total Admissions for Poisoning:
(January 2016-December 2021)

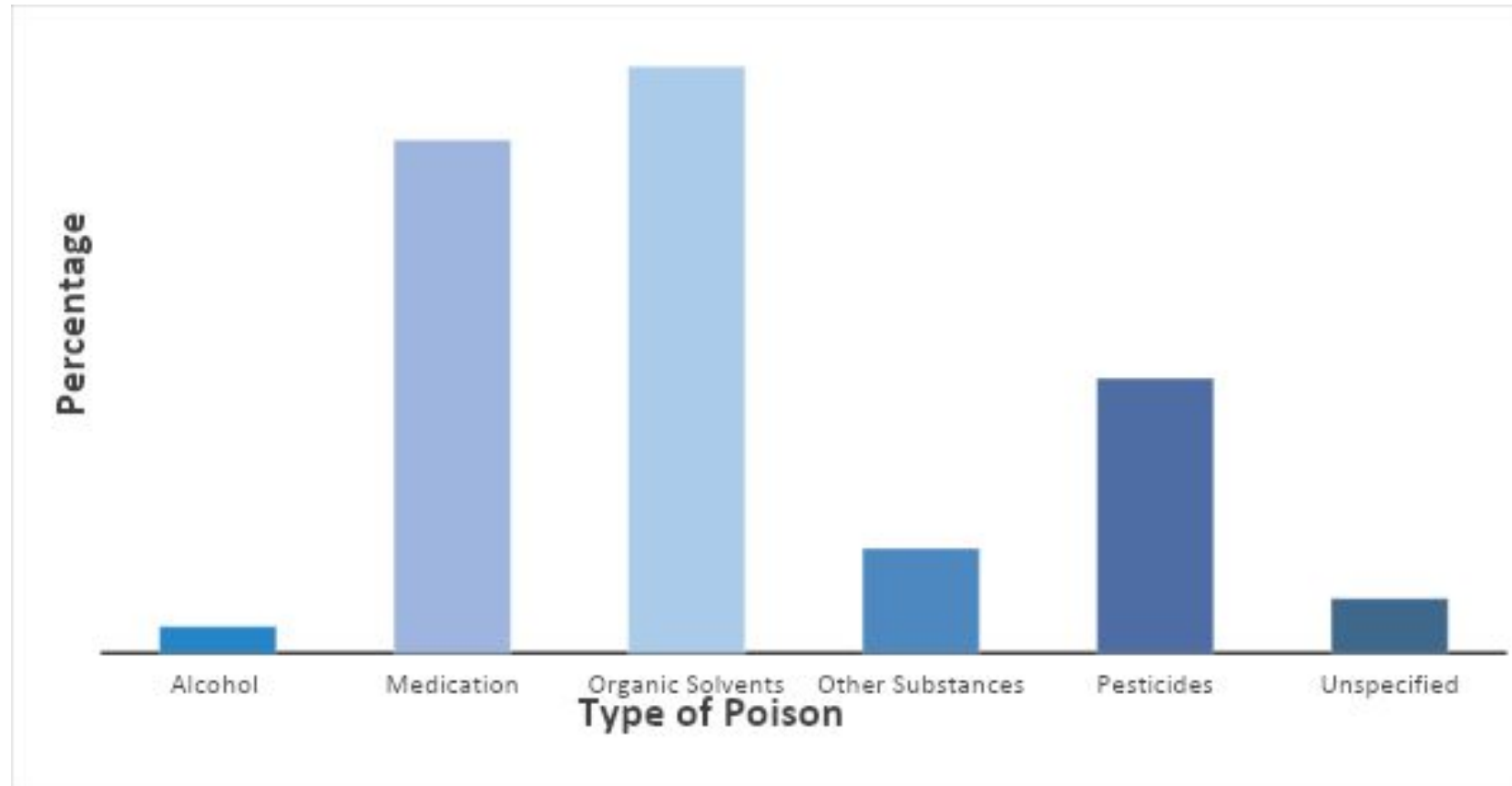
n=2652(4.4%)



INCIDENCE



TYPE OF POISONING



DEMOGRAPHICS

	n=2652
<u>Gender:</u>	
Male	1459 (55.0%)
Female	1177 (44.4%)
Unknown	16 (0.6%)
<u>Age:</u>	
< 5 years	2073 (78.2%)
5 years - < 14 years	579 (21.8%)
<u>Diagnosis:</u>	
Primary diagnosis of poisoning	2489 (93.9%)
Secondary diagnosis of poisoning	163 (6.1%)
Required High Care or ICU	93(3.5%)
<u>Outcome:</u>	
Discharged	2574 (97.1%)
Demised	56 (2.1%)

MULTIVARIANT REGRESSION – OUTCOME (ALIVE VS DEMISED)

	Characteristic	aOR ¹	95% CI ²	p-value
POISON AGENT	Organic solvents	Ref	Ref	
	Alcohol	0.00	0.00 - —	0.999
	Medication	3.48	1.08 -15.5	0.057
	Pesticides	13.9	4.52 - 60.8	<0.001
	Other ingested substances	1.26	0.14 - 8.92	0.800
	Unspecified	12.7	3.27 - 62.8	<0.001
AGE	< 5 years	Ref	Ref	
	> 5- <14 years	1.47	0.75 - 2.79	0.300
GENDER	Male	Ref	Ref	
	Female	0.78	0.42 - 1.41	0.400
DIAGNOSIS	Secondary	Ref	Ref	
	Primary	0.05	0.03 - 0.11	<0.001
HCA ADMISSION	No	Ref	Ref	
	Yes	15.8	6.12 -41.7	<0.001

MULTIVARIANT REGRESSION – OUTCOME (PRE-COVID vs COVID)

	Characteristic	aOR ¹	95% CI ²	p-value
POISON AGENT	Organic solvents	Ref	Ref	
	Alcohol	3.23	1.72 - 6.09	<0.001
	Medication	1.24	0.99 - 1.54	0.063
	Pesticides	1.40	1.07 - 1.81	0.013
	Other ingested substances	1.36	0.94 - 1.96	0.100
	Unspecified	0.47	0.23 - 0.86	0.022
AGE	< 5 years	Ref	Ref	
	5 - < 14 years	1.17	0.93 - 1.45	0.200
GENDER	Male	Ref	Ref	
	Female	1.03	0.86 - 1.23	0.700
DIAGNOSIS	Secondary	Ref	Ref	
	Primary	1.22	0.83 - 1.83	0.300
HCA ADMISSION	No	Ref	Ref	
	Yes	1.09	0.66 - 1.77	0.7



DISCUSSION

- One in 25 children admitted to the CHBAH presented with poisoning.
- The prevalence of 4.4% was slightly higher than reported in France.¹
- The mortality of 2.1% which is 4-fold higher than reported in higher income countries².
- The mortality rate associated with unspecified agent poisoning was the highest at 9.8%, followed by pesticide poisoning at 5.6%.

1. Lamireau, T, Llanas, B, Kennedy, A, Fayon, M., Penouil, F, Favarell-Garrigues, J. C., et al. Epidemiology of poisoning in children: a 7-year survey in a paediatric emergency care unit. Eur J Emerg Med. 2002;9(1):9-14.

2. Alshahrani, M.M.;Albogami, H.A.; Asiri, A.A.; Alhaydhah, K.S.; Aldeaij, I.M.; Aldehaim et al. Epidemiological Trends of Acute Chemical Poisoning among Children over a Recent Three-Year Period in Saudi Arabia ,Children

(Basel). 2023 ;10(2) :295



DISCUSSION

- 17.5% - pesticide poisoning - more than double the rate in high-income countries¹.
- A decrease in the incidence of poisoning was noted during the COVID pandemic years, which contrasts with international studies².

1. Razwiedani LL, Rautenbach P. Epidemiology of Organophosphate Poisoning in the Tshwane District of South Africa. *Environ Health Insights*. 2017;11:1178630217694149

2. Salman H, Salman Z, Akçam M. Childhood Poisoning During the COVID-19 Pandemic. *Turk Arch Pediatr*. 2023;58(3):268-273. doi:10.5152/TurkArchPediatr.2023.22247



LIMITATIONS

- The study was a retrospective review which impacted on data collection for other important variables related to poison exposure, such as time of arrival post poison exposure, circumstances relating to exposure and clinical manifestations of the exposure.
- The use of ICD 10 codes for analysis did not allow us to accurately ascertain whether the poisonings were intentional or unintentional.

CONCLUSION AND RECOMMENDATIONS

- The study highlights a disturbingly high prevalence of poisoning and associated mortality among children hospitalized at CHBAH.
- Further studies are needed to evaluate the burden of poisoning in different settings in SA.
- Urgent public health measures are warranted to alleviate the burden of child poisoning.

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Thank You.