

# Emergency Department Visits for Drug-related Poisoning in the United States

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AT NATIONWIDE CHILDREN'S HOSPITAL



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# Background

- Drug-related poisoning cases have been consistently rising over the years.
- Many of these poisoning cases involve prescription medications.
- Drug-related poisoning is the second leading cause of injury deaths overall, and the leading cause for injury deaths among persons 35-54 years old.



# Study Objectives

- Provide national statistical estimates of emergency department visits due to drug-related poisonings
- Identify special groups who are at high risk for drug-related poisonings
- Identify major drugs that are responsible for current poisoning ED visits.



# Data Source: NEDS

- Nationwide Emergency Department Sample
- NEDS is a database that includes ED charge information for over 75% of patients in the US, regardless of payer, including patients covered by Medicaid, private insurance, and the uninsured.



# Data Source: U.S. Census

- U.S. Census data was used as the denominator in our study.
- The U.S. Census provides an estimate of the total population by age, allowing this study to potentially identify age groups at risk for drug-related poisonings.



# Statistical Analysis

- Emergency Department visits with 95% confidence intervals for all ages and genders were analyzed using SAS and SUDAAN software.
- ED visit payment as well as specific drugs involvements were also analyzed.



# Results

- In the year 2007, an estimated 699,123 poisoning cases occurred nationwide.
- 396,353 (56.7%) of the cases were females, and 302,682 (43.3%) were males.
- The 35-44 age group had the highest frequency of ED visits at 121,989 (17.5%).





# Male vs. Female Poisoning

**Table 1. Characteristics of U.S. Emergency Department Visits for Poisoning, 2007**

	Sample Size(n) in NEDS	National Estimate	Weighted % (95% CI*)
<b>Total</b>	153219	699123	100
<b>Gender</b>			
Male	66354	302682	43.3 (42.8-43.8)
Female	86848	396353	56.7 (56.2-57.2)
Unknown	11	88	0.01 (0.01-0.03)



# Poisoning by Age

<b>Age in Years</b>	<b>Sample Size(n) in NEDS</b>	<b>National Estimate</b>	<b>Weighted % (95% CI*)</b>
0-5	13588	63060	9.0 (8.3-9.8)
6-11	1433	6614	0.9 (0.8-1.0)
12-17	14110	64878	9.3 (8.8-9.8)
18-20	10050	45799	6.6 (6.4-8.8)
21-24	11815	53530	7.7 (7.5-7.9)
25-29	13813	62145	8.9 (8.7-9.1)
30-34	11616	52648	7.5 (7.3-7.7)
35-44	26811	121989	17.5 (17.0-17.9)
45-54	24627	112589	16.1 (15.7-16.5)
55-64	12030	54998	7.9 (7.6-8.1)
65+	13315	60813	8.7 (8.4-9.0)
Unknown	11	59	0.01 (0.00-0.02)

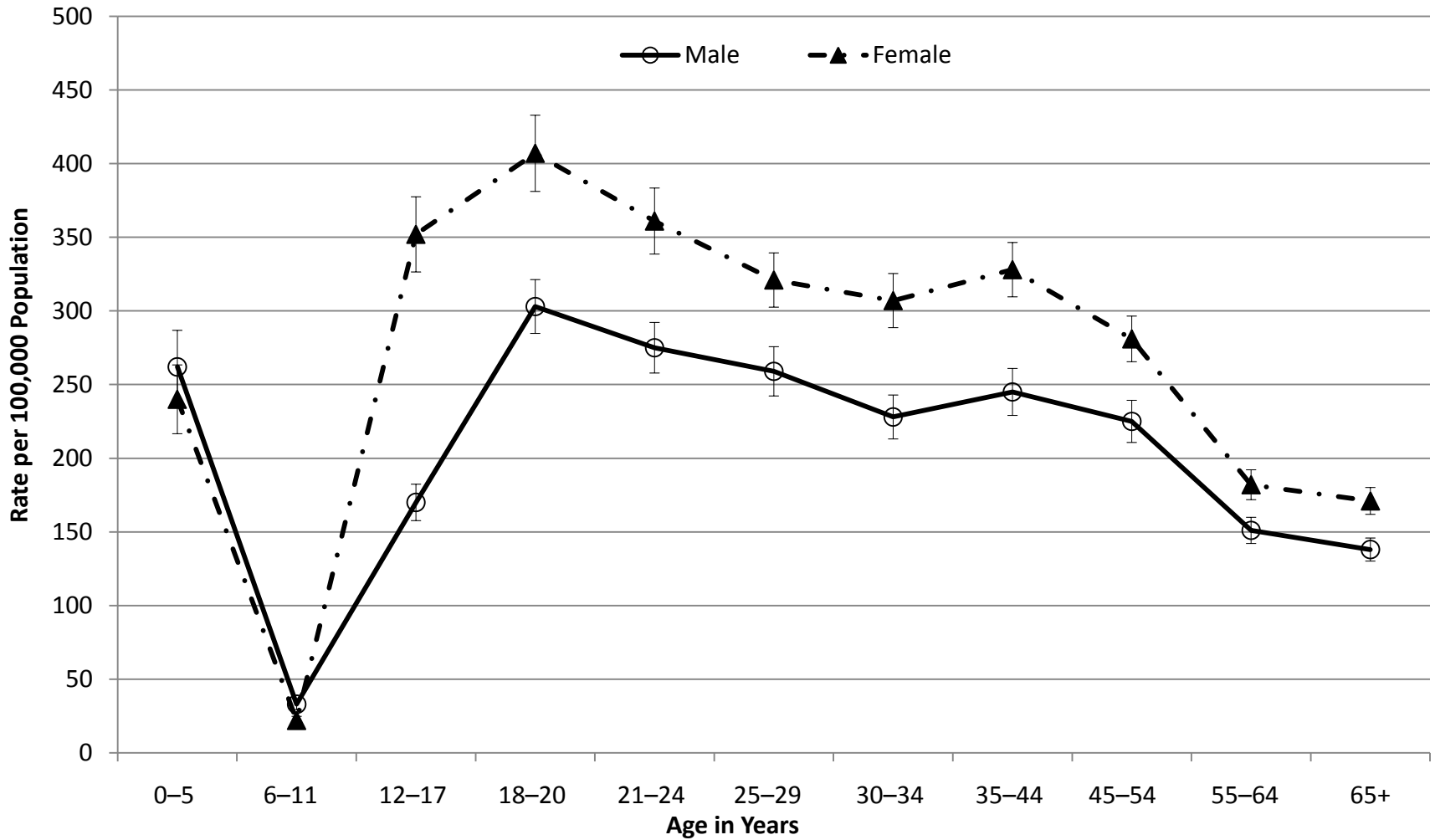


# Results (Continued)

- Overall females had a much higher rate of Emergency Department visits.
- This trend occurred because female poisonings with suicidal intentions were much higher than male.
- Children ages 0-5 had the highest rate of unintentional poisoning than any other age group.



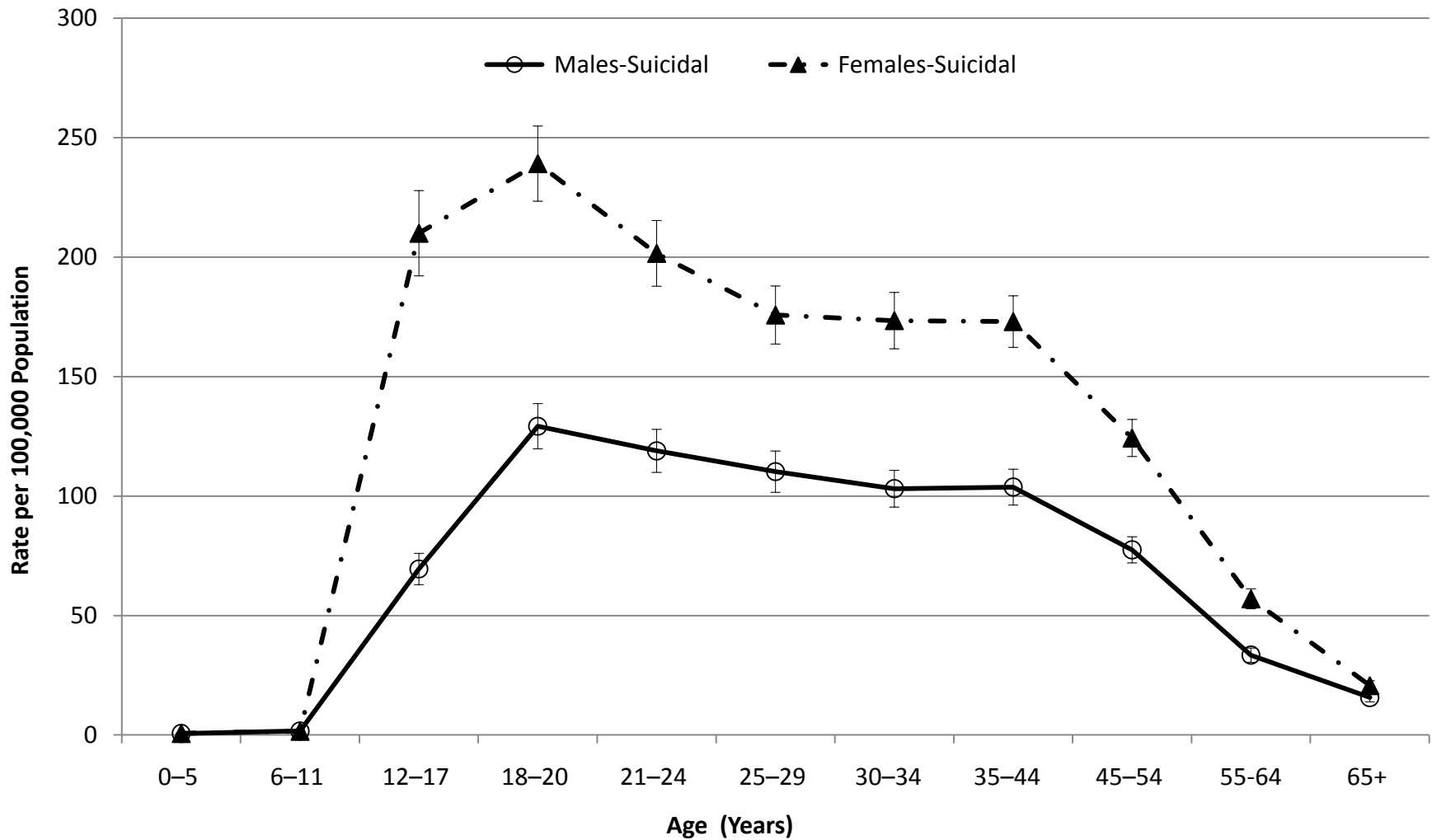
# Age Specific Rate- All Poisoning



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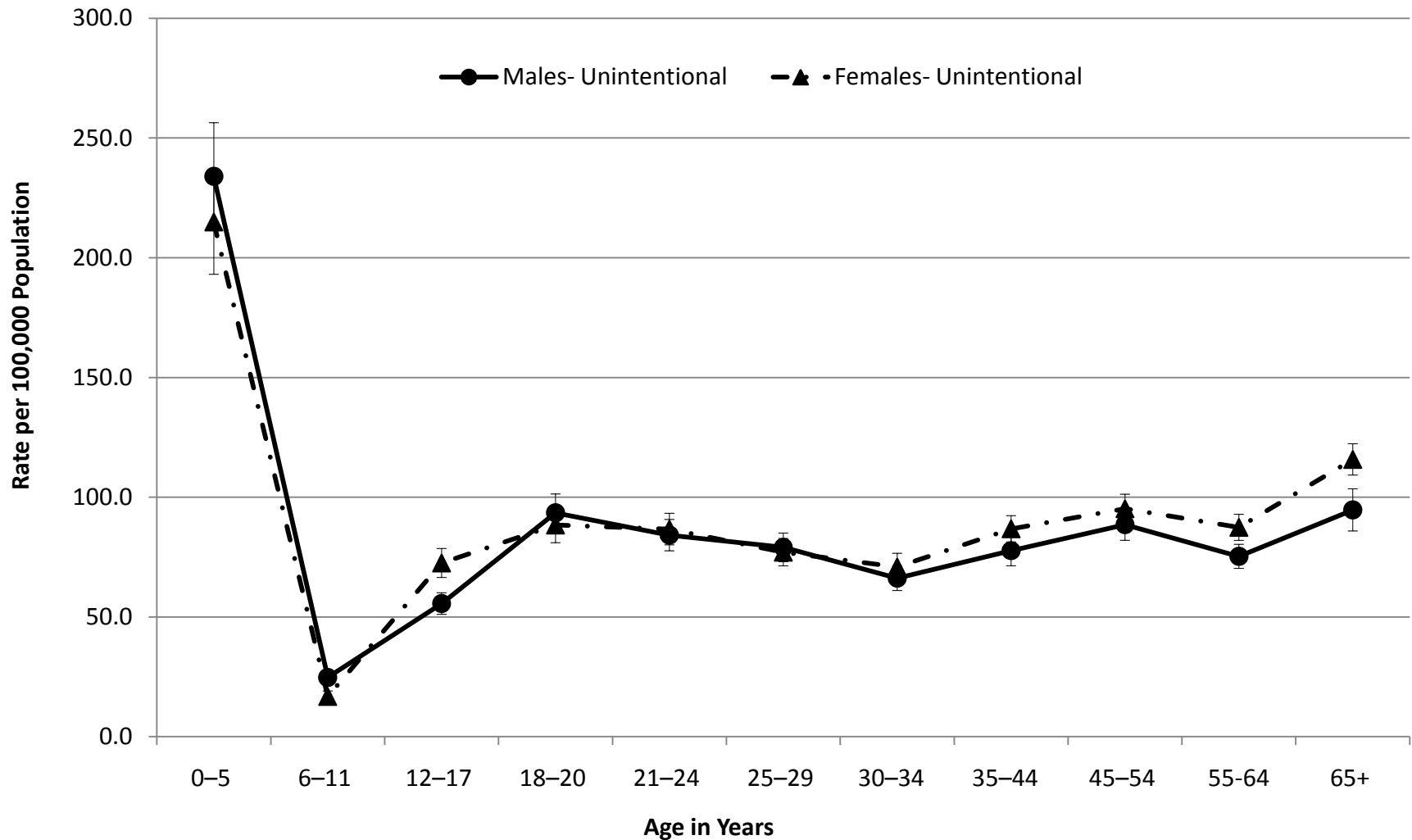
# Age Specific Rate- Suicidal Poisoning



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# Age Specific Rate- Unintentional Poisoning



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# Results (Continued)

- Our data analysis showed that southern areas, as well as low income areas in the U.S. had the highest frequencies for drug-related poisonings.
- Our data further showed that almost 1.4 billion dollars was spent in 2007 alone on ED visits for drug related poisoning, 41.1% of this amount being paid for by government healthcare plans.



# Patient Location

<b>Hospital Region</b>	<b>Sample Size(n) in NEDS</b>	<b>National Estimate</b>	<b>Weighted % (95% CI*)</b>
Northeast	23703	112608	16.1 (14.5-17.9)
Midwest	35228	173275	24.8 (22.8-26.8)
<b>South</b>	<b>62170</b>	<b>266458</b>	<b>38.1 (35.8-40.5)</b>
West	32118	146782	21.0 (19.2-22.9)
<b>Median Household Income in Patient's Zip Code</b>			
<b>\$1-\$37,999</b>	<b>44907</b>	<b>207857</b>	<b>29.7 (27.9-31.7)</b>
<b>\$38,000-\$46,000</b>	<b>40219</b>	<b>183758</b>	<b>26.3 (24.8-27.8)</b>
<b>\$47,000-\$61,999</b>	<b>36757</b>	<b>165918</b>	<b>23.7 (22.3-25.2)</b>
<b>\$62,000 or more</b>	<b>26593</b>	<b>120359</b>	<b>17.2 (15.6-18.9)</b>
<b>Unknown</b>	<b>4743</b>	<b>21232</b>	<b>3.0 (2.5-3.6)</b>





# Primary Payers

Primary Payer	Sample Size(n) in NEDS	National Estimate	Weighted % (95% CI*)
Medicare	26803	122304	17.5 (17.0-18.0)
Medicaid	35258	163080	23.6 (22.4-24.3)
Private including HMO	49758	228127	32.6 (31.6-33.7)
Self-pay	31862	143351	20.5 (19.5-21.6)
No charge	2301	9142	1.3 (0.8-2.2)
Other	6358	29775	4.3 (3.8-4.8)
Unknown	799	3344	0.5 (0.4-0.7)
<b>Total Charges for ED Services</b>	<b>\$1994 (mean)</b>	<b>\$1,394,051,262</b>	



# Results (Continued)

- Out of a large number of harmful substances, our data showed that psychotropic agents and analgesics, antipyretics, and antirheumatics had the highest frequencies of poisoning.
- Of these two groups of drugs, psychotropic agents were in more cases regarding poisoning with suicidal intent.



# Drug Data

**Table 4. Percentage of Unintentional and Suicidal Poisoning**

<b>(%) by Substances Listed as First Diagnosis, 2007</b>	<b>Intent %</b>		
	<b>Unintentional</b>	<b>Suicidal</b>	<b>Other</b>
<b>Substance category</b>			
<b>Analgesics, Antipyretics, and Antirheumatics</b>	40.1%	41.1%	18.8%
<b>Opiates and related narcotics</b>	49.8%	22.8%	27.4%
opium (alkaloids) unspecified	49.6%	18.2%	32.3%
heroin	45.2%	11.8%	43.0%
methadone	53.7%	18.8%	27.5%
other opiates and related narcotics	50.4%	29.8%	19.9%
<b>Salicylates</b>	32.2%	55.5%	12.3%
<b>Aromatic analgesics not elsewhere classified</b>	32.2%	56.1%	11.7%



# Drug Data (Continued)

<b>Psychotropic Agents</b>	<b>29.5%</b>	<b>52.4%</b>	<b>18.1%</b>
<b>Antidepressants</b>	<b>25.3%</b>	<b>61.9%</b>	<b>13.3%</b>
<b>Benzodiazepine-based tranquilizers</b>	<b>27.5%</b>	<b>54.1%</b>	<b>18.9%</b>
<b>Other tranquilizers</b>	<b>27.7%</b>	<b>59.4%</b>	<b>13.3%</b>



# Conclusions

- 1) Females are at higher risk regarding drug-related poisonings because of suicidal intent.
- 2) Children 0-5 years old are at risk due to unintentional drug-related poisonings.
- 3) Poisoning cases present a significant economic problem, costing almost 1.4 billion dollars in 2007 alone.



# Conclusions (Continued)

- 4) Southern areas, as well as low income areas have higher estimates of drug-poisonings and may be at higher risk.
- 5) Analgesics, antipyretics, antirheumatics, and psychotropic agents are responsible for a large part of drug-related poisonings.



# Conclusions (Continued)

- Poisoning prevention strategies should target suicidal females and young children as top priorities, as well as the usage of prescription medicines.

