

State of Alaska
Epidemiology



Bulletin

Recommendations
and
Reports

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Alaska Suicide Toxicology Project Summary, 2015–2017

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Background

Alaska has consistently had one of the highest suicide rates in the nation since the National Violent Death Reporting System began in 2003,¹ and the incidence of suicide in Alaska has increased considerably in recent years.² Substance use has been linked to suicide attempts and completed suicide.³ The extent to which Alaska suicide decedents have used a substance shortly prior to their death has not been well characterized. In 2015, the Alaska Suicide Toxicology Project was initiated to better characterize the proportion of suicide decedents who test positive for alcohol or select drugs of abuse. The Project involves the State Medical Examiner's Office (SMEO) performing routine toxicological analysis of clinical specimens collected from suicide decedents. The purpose of this report is to relay the Alaska Suicide Toxicology Project findings to date.

Methodology

During 2015–2017, SMEO performed toxicology testing for alcohol, amphetamines, benzodiazepines, cocaine, marijuana, and opiates on all suicide decedents for whom specimens could be collected. Postmortem samples that were tested included blood, vitreous fluid, urine, and muscle. Test results were entered into the Alaska Violent Death Reporting System (AKVDRS), which includes data on intentional deaths (e.g., assault and self-harm) obtained from a range of sources, such as death certificates, medical examiner documents, and law enforcement investigation reports.² Samples that were not suitable for testing due to degradation or insufficient sample size were noted as such in AKVDRS. Data were analyzed using SAS software.

Results

Of the 597 suicide death reports identified during 2015–2017, 562 (94%) included toxicology testing results. Of the 562 decedents who were tested, 394 (70%) were positive for alcohol or drugs, 127 (23%) were positive for alcohol alone, 224 (40%) were positive for alcohol alone or alcohol with other substances, and 170 (30%) were positive for drugs without alcohol (Table 1). The most frequently identified substances were alcohol, opiates, marijuana, and amphetamines (Table 2). Analysis of substances identified in suicide decedents by year from 2015–

2017 indicated that alcohol use declined 19% (from 43% in 2015 to 35% in 2017) and opiate use increased 64% (from 11% in 2015 to 18% in 2017; Figure).

More female suicide decedents were positive for any substance than males (75% and 69%, respectively; Table 3). The age groups with the highest proportion of decedents who were positive for any substance were those aged 20–39 years, followed by those aged 40–59 years (Table 4). The proportion of decedents who were positive for any substance by race was highest among Alaska Native people (79%; Table 5). The proportion of toxicology-positive decedents by geographic region was highest in the Southwest (78%), Southeast (73%), and Northern (73%) regions (Table 6). There was little variation in the proportion of decedents positive for any substance by method of suicide (Table 7).

Discussion

This report demonstrates that during 2015–2017, 70% of Alaska suicide decedents on whom a valid toxicological test was performed were positive for one or more substances. The most frequently identified substance was alcohol (in 40% of decedents tested).

Prior to implementation of the Alaska Suicide Toxicology Project in 2015, postmortem toxicology testing was not routinely performed as part of the forensic investigation unless deemed necessary to establish or support cause and manner of death. Routine forensic toxicology testing for all suicide decedents helps improve our understanding of the prevalence and types of substances used by suicide decedents shortly prior to their death. Moreover, the demographic variations presented here can be used to identify priorities for targeted public health, health care system, and medical interventions and to advance advocacy efforts to address health and wellness disparities.

References

1. Centers for Disease Control and Prevention. Web-based Injury Statistics Query and Reporting System. Available at: <https://www.cdc.gov/injury/wisqars/nvdrs.html>
2. Alaska *Epidemiology Bulletin*. "AKVDRS Suicide Death Update — Alaska, 2012–2017." No 1, January 2, 2019. Available at: http://www.epi.alaska.gov/bulletins/docs/b2019_01.pdf
3. Center for Substance Abuse Treatment. (2008). Substance Abuse and Suicide Prevention: Evidence and Implications. HHS Publication No. (SMA) 08-4352. Rockville, MD: Substance Abuse and Mental Health Services Administration.

Table 1. Substance(s) Identified in Suicide Decedents through Toxicology Screening, AKVDRS, 2015–2017

Number of Substances	# Positive for Any Substance	# Positive for Both Alcohol and Drugs	# Positive for Alcohol Only	# Positive for Alcohol Only or Alcohol and Drugs	# Positive for Drugs Only
1	242	--	127	127	115
2	107	66	--	66	41
3	34	21	--	21	13
4	10	9	--	9	1
≥5	1	1	--	1	0
Column Total	394	97	127	224	170
Column Total as % of All Decedents who were Tested (N=562)	70%	17%	23%	40%	30%
Column Total as % of All Decedents who Tested Positive (n=394)	100%	25%	32%	57%	43%

Table 2. Substance Type Identified in Suicides Decedents Who Tested Positive for One or More Substances, AKVDRS, 2015–2017 (n=394)

Substance	# (%) Decedents Only Positive for this Substance	# (%) Decedent Positive for this and Other Substances
Alcohol	127 (32%)	224 (57%)
Amphetamines	20 (5%)	67 (17%)
Benzodiazepines	8 (2%)	47 (12%)
Cocaine	2 (<1%)	12 (3%)
Marijuana	61 (15%)	141 (36%)
Opiates	23 (6%)	83 (21%)

Figure. Substances Identified in Suicide Decedents, by Year, AKVDRS, 2015–2017

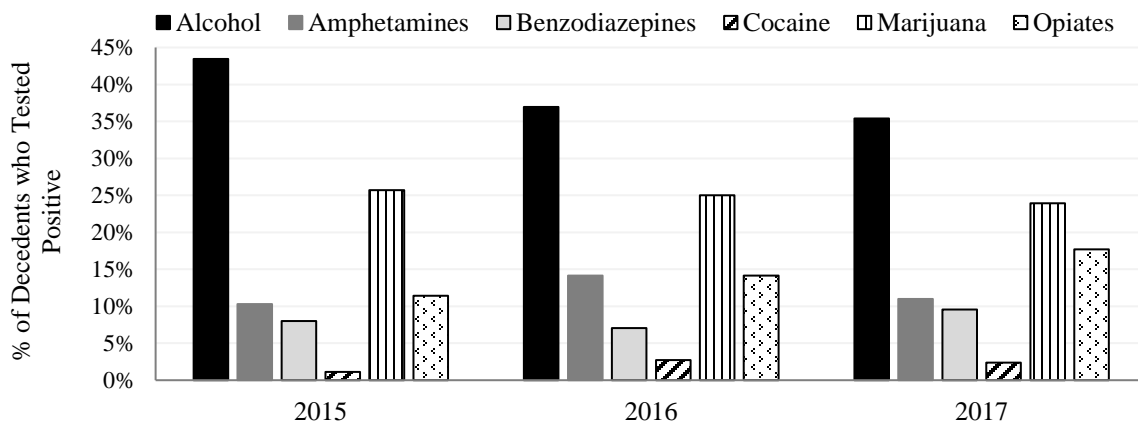


Table 3. Substances Identified in Suicide Decedents, by Sex, AKVDRS, 2015–2017 (N=562)

Sex	Total # of Decedents Tested	# (%) Positive for Any Substance	# (%) Positive for Alcohol Only or Alcohol and Drugs	# (%) Positive for Drugs Only
Male	434	298 (69%)	170 (39%)	128 (29%)
Female	128	96 (75%)	54 (42%)	42 (33%)

Table 4. Substances Identified in Suicide Decedents, by Age Group, AKVDRS, 2015–2017 (N=562)

Age Group (years)	Total # of Decedents Tested	# (%) Positive for Any Substance	# (%) Positive for Alcohol Only or Alcohol and Drugs	# (%) Positive for Drugs Only
10–19	56	25 (45%)	13 (52%)	12 (21%)
20–29	169	130 (77%)	76 (58%)	54 (32%)
30–39	106	83 (78%)	49 (59%)	34 (32%)
40–49	91	66 (73%)	40 (61%)	26 (29%)
50–59	67	49 (73%)	28 (57%)	21 (31%)
60–69	48	33 (69%)	14 (42%)	19 (40%)
70+	25	8 (32%)	4 (50%)	4 (16%)
Total	562	394 (70%)	224 (57%)	170 (30%)

Table 5. Substances Identified in Suicide Decedents, by Race, AKVDRS, 2015–2017 (N=562)

Race	Total # of Decedents Tested	# (%) Positive for Any Substance	# (%) Positive for Alcohol Only or Alcohol and Drugs	# (%) Positive for Drugs Only
White	324	218 (67%)	113 (35%)	105 (32%)
American Indian/ Alaska Native	165	130 (79%)	85 (52%)	45 (27%)
Other	67	41 (61%)	23 (34%)	18 (27%)
Unknown	6	5 (83%)	3 (50%)	2 (33%)

Table 6. Substances Identified in Suicide Decedents, by Region, AKVDRS, 2015–2017 (N=562)

Region	Total # of Decedents Tested	# (%) Positive for Any Substance	# (%) Positive for Alcohol Only or Alcohol and Drugs	# (%) Positive for Drugs Only
Anchorage	200	137 (69%)	77 (39%)	60 (30%)
Interior	86	56 (65%)	30 (35%)	26 (30%)
Southwest	67	52 (78%)	32 (48%)	20 (30%)
Gulf Coast	64	44 (69%)	26 (41%)	18 (28%)
Mat-Su	59	42 (71%)	23 (39%)	19 (32%)
Southeast	45	33 (73%)	15 (33%)	18 (40%)
Northern	41	30 (73%)	21 (51%)	9 (22%)

Table 7. Toxicology Testing Results of Suicide Decedents, by Method, AKVDRS, 2015–2017 (N=562)

Method	# of Decedents	# (%) of Decedents who were Tested	# (%) of Decedents Who Tested Positive for One or More Substances
Firearm	360	335 (93%)	224/335 (67%)
Hanging/Strangulation/Suffocation	167	161 (96%)	118/161 (73%)
Poisoning (includes intentional substance overdose)	48	47 (98%)	43/47 (91%)
Other	22	19 (86%)	9/19 (47%)
Total	597	562 (94%)	394/562 (70%)