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To cite this article: Brandon Hoeflein , Lorna Chiu , Gabriel Corpus , Mego Lien , Michelle A. Jorden & Joyce Chu (2020): Ethnic variations in suicide method and location: An analysis of decedent data, *Death Studies*, DOI: [10.1080/07481187.2020.1805820](https://doi.org/10.1080/07481187.2020.1805820)

To link to this article: <https://doi.org/10.1080/07481187.2020.1805820>



Published online: 13 Aug 2020.



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REPORT



## Ethnic variations in suicide method and location: An analysis of decedent data

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### ABSTRACT

This study analyzed ethnic variations in suicide method and suicide location for 1,145 suicide deaths in a diverse California county. Hanging was the most common method of suicide death. Latino/a/x and Asian and Pacific Islander (API) decedents were more likely to suicide-by-hanging; White and African American decedents were more likely to suicide-by-firearms. API and African American decedents were less likely than White decedents to die-by-suicide at home. Suicide location can be predicted by the co-occurring influence of ethnicity and suicide method. Implications focus on culturally-informed suicide prevention research, assessment, and risk management.

Over the past 50 years, the field of suicide prevention has documented cultural variations in suicide stressors, suicide methods, and suicide acceptability (e.g., Leong & Leach, 2008). At the same time, a separate movement in suicide prevention has highlighted the critical role of decedent data in illustrating the antecedents, context, and circumstances of suicide deaths (e.g., Jordan & McNiel, 2020). However, few studies have synthesized these approaches to understand cultural variations in suicide method and suicide location based on decedent data. This study aims to fuse these two approaches in order to facilitate further development of effective, culturally-informed suicide prevention.

When examining individuals who have died-by-suicide (suicide decedents), a number of cultural analyses have pointed to firearms as the most common suicide method for White (e.g., Straif-Bourgeois & Ratard, 2012), African American (Joe et al., 2007) and Latino/a/x individuals (Ikeda et al., 2004). Although these studies are beneficial in that they provide an impetus for firearm means safety efforts, more recent analyses have revealed an increase in the rates of suicide-by-hanging (Curtin et al., 2016; Matthay et al., 2017), which appear particularly prevalent amongst ethnic minority individuals (Kuroki, 2018; Matthay et al., 2017; Shiang et al., 1998).

A small set of suicide decedent studies have analyzed the relationship between ethnicity and suicide method; however, these studies tend to interpret and report their findings in a manner that is not easily translatable to practice. For instance, one analysis of suicide decedent data compared suicide methods within a sample primarily composed of White and African American decedents from the Midwest (Fisher et al., 2015). They found that White decedents accounted for 76.6% of firearm suicide deaths and 82% of hanging suicide deaths, but they did not report which suicide method is most common for White decedents or African American decedents. Shiang et al. (1998) addressed some of these limitations when reporting that firearms accounted for a plurality of suicide deaths for White (26%) and African American decedents (30%), but hanging was the most common suicide death method for Latino/a/x (31%) and API (27%) decedents. However, this analysis is limited in generalizability as the data is a generation old and limited in the number of African American decedents. More specific analyses of the ethnicity-method relationship are needed in order to move the field forward.

Compared to the oft-studied variable of suicide method, there is a dearth of data on suicide location. This gap is notable because there is reason to suggest that suicide location is a factor highly susceptible to the influence of culture, such as the social

implications of how the decedent's body is found (Shiang et al., 1998). In fact, it may be time to discuss whether suicide location has cultural meaning.

As early as the 1980s, ethnic variations in suicide location have been noted, with one early study finding that 9 of 11 out-of-state suicide decedents were White men (Hanzlick & Ross, 1987). From 1990 through 2004, Manhattan was the site of 407 suicide deaths by individuals who did not live in New York City; these individuals tended to be White or API (Gross et al., 2007). Lester and Frank (1990) noted equal rates of out-of-state suicide deaths among White and African American individuals, but did not report on Latino/a/x or API individuals. These studies are limited in their generalizability due to small sample size (Hanzlick & Ross, 1987) and exclusion of Latino/a/x and API decedents (Gross et al., 2007; Lester & Frank, 1990).

The existing literature is also sparse in discussing whether ethnic minority suicide deaths are more likely to take place inside or outside of the decedent's home. One study found that White individuals are more likely than African American individuals to die-by-suicide at home (72% vs. 58%, respectively; Abe et al., 2006). More recently, international data have shown that 58.7% of U.S. suicide deaths in 2008 took place in the decedent's home; however, this analysis did not consider ethnic variations (Rhee et al., 2016). In sum, the minimal literature offers only preliminary evidence of ethnic variations in suicide location.

Determination of ethnic differences in suicide variables, particularly suicide location, would have notable implications for culturally-informed suicide assessment, management, and prevention strategies. This study is grounded in two gaps in the literature. First, many analyses of suicide decedent methods are outdated, and their samples are often limited in ability to draw conclusions about ethnic variations. Second, there is much to be learned regarding ethnic variations in suicide location.

The present study hypothesizes that ethnic minority decedents are more likely to suicide-via hanging. This study will also be among the first to explore the relationship between ethnicity and suicide location, the location of specific suicide methods, and potential ethnicity-method interactions in the prediction of suicide location.

## Method

### Population

Archival data were extracted for 1,183 suicide decedents from a northern California county for the years

2009 to 2016. Data came from the County Medical Examiner-Coroner's office, which is responsible for certifying cause and manner of death as well as investigating and collecting information on all unnatural deaths that occur in the County, including suicide deaths. The research team extracted the following variables of interest: ethnicity, location of death, and suicide method.

In total, 1,145 cases (846 male, 299 female) were included. The ethnic breakdown was as follows: 745 White (65.1%), 223 API (19.5%), 150 Latino/a/x (13.1%), and 27 African American (2.4%). Also, 38 cases were deleted because ethnicity was missing or there were too few cases to analyze (e.g., Middle Eastern, Native American).

## Measures

### Suicide method

Based on written descriptions from the Medical Examiner-Coroner's investigative death reports, the research team coded each decedent's suicide death into one of the following methods: hanging; firearms; drugs/poison; asphyxiation; train collision; jumping; stabbing/cutting; drowning; self-immolation; automobile collision; and other. After excluding suicide methods with less than 30 total cases, the following methods were included in the analyses: hanging; firearms; drugs/poison; asphyxiation; train; jumping; and stabbing/cutting.

### Suicide location

Based on the written descriptions from the Medical Examiner-Coroner's investigative death reports, the research team coded each decedent's suicide death as occurring inside the home (e.g., in the building, on the patio, in the backyard) or outside the home (e.g., hotel, public park, vehicle).

## Results

Hanging was the most prevalent suicide method for API and Latino/a/x decedents, and firearms were most prevalent for African American and White decedents. An omnibus chi-square test of independence revealed significant associations between ethnicity and suicide method ( $\chi^2 = 106.446$ ,  $p < .001$ ,  $df = 30$ , Cramer's  $V = 0.176$ ). As such, pairwise chi-square analyses indicated that rates of suicide-by-hanging were higher among Latino/a/x decedents (49.3%) and API (43.5%) decedents when compared to White decedents (25.6%;  $\chi^2 = 33.638$ ,  $p < .001$ ;  $\chi^2 = 26.194$ ,

**Table 1.** Rates of suicide method and suicide location, by ethnicity.

Method	White (n = 745)	Asian/Pacific Islander (n = 223)	Latino/a/x (n = 150)	African American (n = 27)
Hanging (n = 369)	191 (25.6%) <sup>a</sup>	97 (43.5%) <sup>b,c</sup>	74 (49.3%) <sup>b</sup>	7 (25.9%) <sup>a,c</sup>
Firearms (n = 352)	267 (35.8%) <sup>a</sup>	43 (19.3%) <sup>b</sup>	33 (22.0%) <sup>b</sup>	9 (33.0%) <sup>a,b</sup>
Drugs/Poison (n = 158)	120 (16.1%) <sup>a</sup>	20 (10.0%) <sup>b</sup>	14 (9.3%) <sup>b</sup>	4 (14.8%) <sup>a,b</sup>
Asphyxiation (n = 75)	58 (7.8%) <sup>a</sup>	14 (6.3%) <sup>a</sup>	2 (1.3%) <sup>b</sup>	1 (3.7%) <sup>a,b</sup>
Train (n = 54)	35 (4.7%) <sup>a</sup>	10 (4.5%) <sup>a</sup>	6 (4.0%) <sup>a</sup>	3 (11.1%) <sup>a</sup>
Jumping (n = 48)	18 (2.4%) <sup>a</sup>	21 (9.4%) <sup>b</sup>	8 (5.3%) <sup>a,b</sup>	1 (3.7%) <sup>a,b</sup>
Cutting/Stabbing (n = 36)	25 (3.4%) <sup>a</sup>	6 (2.7%) <sup>a</sup>	5 (3.3%) <sup>a</sup>	0 (0.0%) <sup>a</sup>
Drowning (n = 11)	5 (0.7%) <sup>a</sup>	5 (2.2%) <sup>a</sup>	1 (0.7%) <sup>a</sup>	0 (0.0%) <sup>a</sup>
Immolation (n = 10)	6 (0.8%) <sup>a</sup>	3 (1.3%) <sup>a</sup>	1 (0.4%) <sup>a</sup>	0 (0.0%) <sup>a</sup>
Automobile (n = 8)	4 (0.5%) <sup>a</sup>	2 (0.9%) <sup>a</sup>	2 (1.3%) <sup>a</sup>	0 (0.0%) <sup>a</sup>
Other (n = 24)	16 (2.1%) <sup>a</sup>	2 (0.9%) <sup>a</sup>	4 (2.7%) <sup>a</sup>	2 (7.4%) <sup>a</sup>
Location	White (n = 735)	Asian/Pacific Islander (n = 220)	Latino/a/x (n = 149)	African American (n = 26)
In the Home (n = 753)	512 (69.7%) <sup>a</sup>	128 (58.2%) <sup>b,c</sup>	100 (67.1%) <sup>a,b</sup>	13 (50.0%) <sup>b,c</sup>
Outside the Home (n = 377)	223 (30.3%)	92 (41.8%)	49 (32.9%)	13 (50.0%) <sup>b</sup>

Note. Groups with different superscripts are significantly different,  $p < .05$ .

**Table 2.** Rates of suicide location, by suicide method.

Method	In the Home (n = 741)	Outside the Home (n = 311)	$\chi^2$ Goodness of Fit
Hanging	253 (68%)	119 (32%)	48.269**
Firearms	266 (74.5%)	91 (25.5%)	85.784**
Drugs/Poison	127 (78.9%)	34 (21.9%)	53.720**
Asphyxiation	55 (72.4%)	21 (27.6%)	15.211**
Jumping	13 (26.5%)	36 (73.5%)	10.796*
Cutting/Stabbing	27 (73%)	10 (27%)	7.811*

\*Significant at  $p < .01$ ; \*\* significant at  $p < .001$ .

$p < .001$ ). Firearms were more likely to be used by White decedents (35.8%) than Latino/a/x decedents (22.0%) and API decedents (19.3%;  $\chi^2 = 10.731$ ,  $p = .001$ ;  $\chi^2 = 26.611$ ,  $p < .001$ ). See Table 1 for ethnic variations in drugs/poisoning, asphyxiation, and jumping.

Table 1 shows the most common suicide location for each ethnicity. A majority of White, Latino/a/x, and API decedents died-by-suicide inside the home, and 50% of African American decedents died-by-suicide at home. An omnibus chi-square test of independence revealed significant associations between ethnicity and suicide location ( $\chi^2 = 13.35$ ,  $p = .004$ ,  $df = 3$ , Cramer's  $V = 0.109$ ). Pairwise chi-square tests of independence revealed that White decedents died-by-suicide at home at rates higher (69.7%) than API decedents (58.2%) and African American decedents (50.0%;  $\chi^2 = 10.092$ ,  $p = .001$ ;  $\chi^2 = 4.537$ ,  $p = .033$ ).

Table 2 shows the rates of suicide death location, stratified by suicide method. An omnibus chi-square test of independence revealed significant associations between suicide method and suicide location ( $\chi^2 = 177.30$ ,  $p < .001$ ,  $df = 10$ , Cramer's  $V = 0.392$ ). Pairwise chi-square tests of independence indicated that a majority of the following suicide methods took place inside the home: drugs/poison (78.9%), firearms (74.5%), cutting (73%), asphyxiation (72.4%), and hanging (68%). The only suicide method that took

**Table 3.** Hierarchical logistic multiple regression predicting suicide location among White and API decedents using ethnicity-method as a moderating variable.

	Step 1			Step 2		
	B	SE	p	B	SE	p
Ethnicity <sup>a</sup>	-0.102	0.047	0.030	-0.386	0.080	<.01
Method <sup>b</sup>	-0.048	0.040	0.229	-0.592	0.132	<.01
Ethnicity*Method	-	-	-	0.452	0.104	<.01

<sup>a</sup>Coded as White vs. API. <sup>b</sup>Coded as firearms vs. hanging.

place predominantly outside the home was jumping (73.5%).

A series of binomial hierarchical multiple regressions tested whether the interaction of ethnicity and suicide method predicted suicide location (inside the home vs. outside the home). Step 1 variables controlled for the main effects of ethnicity (dummy-coded each identity; e.g., White vs. Latino/a/x) and suicide method (dummy-coded hanging vs. method). In all, six regressions allowed for the testing of each pair-wise ethnic permutation (e.g., White vs. African American, Latino/a/x vs. API, etc.). Of the six pair-wise ethnicity models, the only significant interaction occurred in comparing White vs. API individuals (Table 3). After controlling for the main effects of ethnicity and suicide method, the interaction term explained an additional 3.0% of variation in suicide location ( $\Delta R^2 = .030$ ,  $F(1, 720) =$

594,  $p < .001$ ). Follow-up analysis revealed that API decedents who died-by-firearms were more likely to die-by-suicide outside the home than White individuals who died-by-firearms (H4).

## Discussion

The current study demonstrates ethnic variations in suicide method and suicide location in a sample of 1,145 suicide deaths from 2009 to 2016 in a Northern California county. Firearms were the most common suicide method for White and African American decedents, and hanging was the most common suicide method for Latino/a/x and API suicide decedents. In fact, when considering the data in aggregate, hanging—not firearms—represented the most prevalent method of suicide death, which is consistent with other data from California (Matthay et al., 2017). Regarding the under-studied variable of suicide location, data suggest that White decedents were more likely to die-by-suicide at home than API decedents and African American decedents.

The ethnicity-location-method analysis revealed a notable variation in suicide pattern: compared to White firearm suicide deaths, API firearm suicide deaths were more likely to occur outside the home. Although the dataset is limited in its ability to fully explain this disparity, shame and collectivism may play a role. Specifically, API individuals who die-by-suicide may choose their suicide location to shape the grief experience of their surviving family members. This hypothesis extends the established role of shame on suicide acceptability, suicide method, and the expression of suicidality within API individuals (Chu et al., 2018). A collectivistic lens suggests that suicide can be conceptualized as a purposeful, social act as opposed to an individual one (e.g., Shiang et al., 1998). Subsequently, after a suicide death, members of the API community may question whether the decedent's family contributed to the decedent's death. As such, decedents who chose to die-by-suicide in their homes may have intended for their family to experience some level of public shaming for their suicide. Alternatively, those who chose to die-by-suicide outside of the home may have done so in an attempt to shield their family from the shame of finding their body and being blamed by the wider API community. This post-hoc explanation is hypothetical in nature; future research is needed to understand the disparity between White and API firearm suicide death locations.

The current study yields implications and future directions for culturally-informed suicide risk assessment, management, and prevention at the clinical, community, and systems levels. First, future work should consider the cultural processes that explain ethnic variations in suicide method and suicide location. This line of research would likely benefit from interviews with survivors of suicide attempts who can explain the rationale behind their chosen suicide location (e.g., likelihood of being found, shame).

Second, clinicians should strongly consider including ideated suicide location as part of risk assessment efforts. After assessing for any suicidal ideation and a suicide plan, clinicians can assess for ideated suicide location with a simple question, such as "When you're thinking about this method, does the plan take place in a specific location?" The answer to this question will allow clinicians to include the ideated location as a warning sign and to use collaterals (e.g., family) to reduce the likelihood that the suicidal person is alone in the ideated location. Third, clinicians should consider hanging means restriction to items that could be used as ligatures (e.g., belts, ropes) and locations that could be used for hanging (e.g., closets, exposed beams).

Finally, the current results demonstrate the need for additional work on hanging means restriction. There is a disparity in means restriction efforts, such that there has been significant work on restricting access to firearms, the most prevalent suicide method for White and African American individuals; however, there has been minimal work on restricting access to hanging, the most prevalent suicide method for Latino/a/x and API individuals. Currently, the literature holds that hanging cannot be restricted due to the ubiquitous nature of ligatures and hanging points (Yip et al., 2012). However, the current findings highlight the need for the field of suicide prevention to study the feasibility and effectiveness of hanging means restriction. As an example, future research can investigate the efficacy of hanging means restriction counseling, in an effort to empower clients and supportive others to restrict access to ligatures and hanging points (Bryan et al., 2011).

These findings should be understood within the context of the study's limitations. First, African American individuals are under-represented ( $n = 27$ ). Second, sub-group analyses of API and Latino/a/x populations were not possible, as these data were not available in this archival dataset. Third, other ethnic groups were absent from the current analysis due to low numbers (e.g., Native American/Alaskan Native



decedents). Although representative of only one county in the United States, this analysis contributes to the suicide prevention literature by highlighting ethnic variations in suicide method and suicide location. In turn, these findings offer guidance for the prevention of suicide deaths across all ethnic identities.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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## References

- Abe, K., Mertz, K. J., Powell, K. E., & Hanzlick, R. L. (2006). Characteristics of black and white suicide decedents in Fulton County, Georgia, 1988–2002. *American Journal of Public Health*, 96(10), 1794–1798. <https://doi.org/10.2105/AJPH.2005.082131>
- Bryan, C. J., Stone, S. L., & Rudd, M. D. (2011). A practical, evidence-based approach for means restriction counseling with suicidal patients. *Professional Psychology: Research and Practice*, 42(5), 339–346. <https://doi.org/10.1037/a0025051>
- Chu, J., Lin, M., Akutsu, P. D., Joshi, S. V., & Yang, L. H. (2018). Hidden suicidal ideation or intent among Asian American Pacific Islanders: A cultural phenomenon associated with greater suicide severity. *Asian American Journal of Psychology*, 9(4), 262–269. <https://doi.org/10.1037/aap0000134>
- Curtin, S. C., Warner, M., & Hedegaard, H. (2016). *Increase in suicide in the United States, 1999–2014*. NCHS Data Brief (No. 241). National Center for Health Statistics.
- Fisher, L. B., Overholser, J. C., & Dieter, L. (2015). Methods of committing suicide among 2,347 people in Ohio. *Death Studies*, 39(1–5), 39–43. <https://doi.org/10.1080/07481187.2013.851130>
- Gross, C., Piper, T. M., Bucciarelli, A., Tardiff, K., Vlahov, D., & Galea, S. (2007). Suicide tourism in Manhattan, New York City, 1990–2004. *Journal of Urban Health: Bulletin of the New York Academy of Medicine*, 84(6), 755–765. <https://doi.org/10.1007/s11524-007-9224-0>
- Hanzlick, R. L., & Ross, W. K. (1987). Suicide far from home: The concept of transjurisdictional suicide. *Journal of Forensic Science*, 32(1), 189–191.
- Ikeda, R. M., Crosby, A., Thomas, R. G., Annet, J. L., & Berrios-Torres, S. I. (2004). Suicide among Hispanics – United States, 1997–2001. *Morbidity & Mortality Weekly Report*, 53(22), 478–481.
- Joe, S., Marcus, S. C., & Kaplan, M. S. (2007). Racial differences in the characteristics of firearm suicide decedents in the United States. *The American Journal of Orthopsychiatry*, 77(1), 124–130. <https://doi.org/10.1037/0002-9432.77.1.124>
- Jordan, J. T., & McNiel, D. E. (2020). Characteristics of persons who die on their first suicide attempt: Results from the national violent death reporting system. *Psychological Medicine*, 50(8), 1390–1397. <https://doi.org/10.1017/S0033291719001375>
- Kuroki, Y. (2018). Comparison of suicide rates among Asian Americans in 2000 and 2010. *Omega*, 77(4), 404–411. <https://doi.org/10.1177/0030222816678425>
- Leong, F., & Leach, M. (2008). *Suicide among racial and ethnic minority groups: Theory, research, and practice (the series in death, dying, and bereavement)*. Routledge.
- Lester, D., & Frank, M. L. (1990). Suicide and homicide away from home. *The American Journal of Forensic Medicine and Pathology*, 11(4), 298–299. <https://doi.org/10.1097/00000433-199012000-00006>
- Matthay, E. C., Galin, J., & Ahern, J. (2017). Changing patterns in rates and means of suicide in California, 2005 to 2013. *American Journal of Public Health*, 107(3), 427–429. <https://doi.org/10.2105/AJPH.2016.303624>
- Rhee, YJoo., Houttekier, D., MacLeod, R., Wilson, D. M., Cardenas-Turanzas, M., Loucka, M., Aubry, R., Teno, J., Roh, S., Reinecke, M. A., Deliens, L., & Cohen, J. (2016). International comparison of death place for suicide; a population-level eight country death certificate study. *Social Psychiatry and Psychiatric Epidemiology*, 51(1), 101–106. <https://doi.org/10.1007/s00127-015-1148-5>
- Shiang, J., Blinn, R., Bongar, B., Stephens, B., Allison, D., & Schatzberg, A. (1998). 9 suicide in San Francisco, CA: A comparison of Caucasian and Asian groups, 1987–1994. *Suicide and Life-Threatening Behavior*, 27(1), 80–91.
- Straif-Bourgeois, S., & Ratard, R. (2012). Suicide mortality rates in Louisiana, 1999–2010. *Journal of the Louisiana State Medical Society: Official Organ of the Louisiana State Medical Society*, 164(5), 274–276.
- Yip, P. S. F., Caine, E., Yousuf, S., Chang, S., Wu, K. C., & Chen, Y. (2012). Means restriction for suicide prevention. *Lancet*, 379(9834), 2393–2399. [https://doi.org/10.1016/S0140-6736\(12\)60521-2](https://doi.org/10.1016/S0140-6736(12)60521-2)