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Violent Deaths Reporting System

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Editors:

Diego E. Zavala Zegarra, MSc, PhD

Mariluz Bezares Salinas, BS, MS

Tania M. Martínez Sánchez, BS, MPH

Glorián Carrasquillo Sánchez, BA, MPH

Kimberly Cartagena Rivera, BA, MPH

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Puerto Rico Violent Deaths Reporting System Staff

Principal Investigators

Diego E. Zavala Zegarra, MS, PhD

Mariluz Bezares Salinas, BS, MS

Program Coordinator

Mariluz Bezares Salinas, BS, MS

Data Abstractors

Glorián Carrasquillo Sánchez, BA, MPH

Tania Martínez Sánchez, BS, MPH

Yamilka Pérez Fontánez

Data Quality

Kimberly Cartagena Rivera, BA, MPH

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Introduction

The Puerto Rico Violent Death Reporting System (PRVDRS) is an epidemiological surveillance system designed to obtain a complete census of violent deaths in Puerto Rico. The PRVDRS, affiliated to the Institute of Statistics of Puerto Rico, began its participation in the National Violent Death Reporting System (NVDRS) in September 2016 through a collaborative agreement funded by the Centers for Disease Control and Prevention (CDC) of the Department of Health and Human Services. By 2017, 40 states, the District of Columbia (D.C.) and Puerto Rico participated in the NVDRS. Since 2018, all 50 states participate, in addition to D.C. and Puerto Rico.

The PRVDRS collects, consolidates, analyzes and publishes information on all violent deaths in Puerto Rico. Violent deaths occur by suicide or homicide, as well as deaths from unintentional firearm injuries, deaths due to legal intervention (excluding legal executions) and deaths with undetermined intent.

The documentation of violent deaths is carried out through a collaboration agreement with the Forensic Sciences Institute, Bureau of the Police of Puerto Rico and the Demographic Registry (Vital Statistics) of the Department of Health.

For the description of the following topics of interest, please refer to the first edition of the Puerto Rico Violent Deaths Annual report - 2017, available at: https://estadisticas.pr/files/Publicaciones/Informe%20Muertes%20Violentas%202017_2020%200710-CEE.pdf

Data Sources and Methods

Definition of a violent death

Circumstances

Firearms

Quality and Integrity of Data

Mortality Rates

Puerto Rico Population - 2019

Table 1 shows the estimates of the 2019 population by age group and sex in Puerto Rico (United States Census Bureau, 2020). Figure 1 shows the population pyramid for the same year. In 2019, the median age for men was 41 years and 45 years for women. There is no official classification for race used in Puerto Rico, nevertheless, in the 2020 Census, 60.0% of the residents in Puerto Rico identified themselves as white, 98.7% as Hispanic/Latino, and 95.4% Puerto Rican.

Figure 2 shows Puerto Rico’s location in the Caribbean region and Figure 3 presents a map of Puerto Rico with the 78 municipalities, including the islands of Vieques and Culebra.

Table 1. Puerto Rico Population by Age and Sex, 2019

Age Groups	Both Sexes	Men	Women
0 - 4	117,561	60,046	57,515
5 - 9	157,660	79,848	77,812
10 - 14	182,759	92,910	89,849
15 - 19	201,617	103,022	98,595
20 - 24	216,483	109,930	106,553
25 - 29	219,888	109,743	110,145
30 - 34	185,283	89,770	95,513
35 - 39	189,475	89,246	100,229
40 - 44	198,891	94,172	104,719
45 - 49	204,144	96,777	107,367
50 - 54	211,879	98,901	112,978
55 - 59	219,288	100,377	118,911
60 - 64	209,076	95,687	113,389
65 - 69	189,953	85,699	104,254
70 - 74	176,613	79,281	97,332
75 - 79	131,233	57,700	73,533
80 - 84	90,688	38,751	51,937
85 +	91,062	33,738	57,324
Total	3,193,553	1,515,598	1,677,955
Median age	43.2	41.3	44.9

Figure 1. Puerto Rico Population Pyramid , 2019

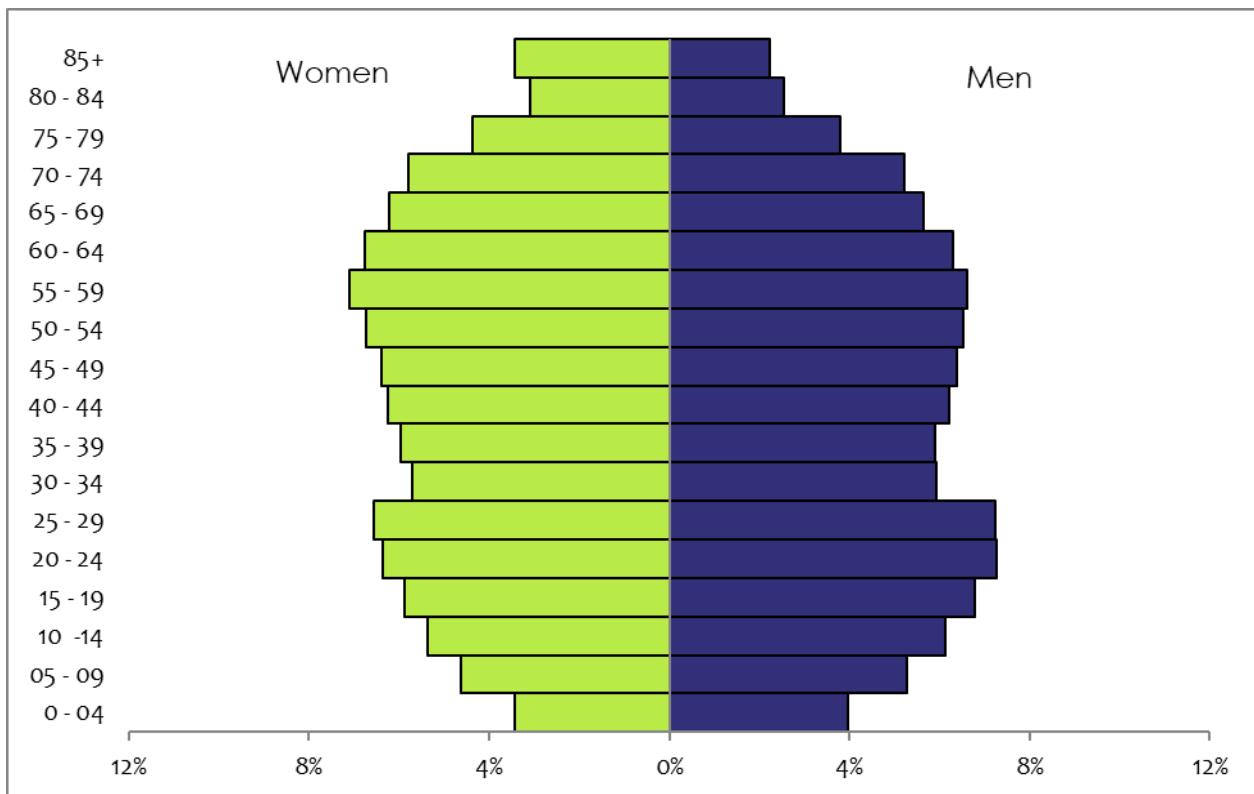


Figure 2. Caribbean Region and Puerto Rico



Figure 3. Map of Puerto Rico's 78 municipalities



VIOLENT DEATHS IN PUERTO RICO 2019

OVERVIEW

Violent Deaths - 2019

During 2019, 828 incidents of violent deaths were reported, resulting in 894 victims, mostly from single or multiple homicides (631 victims, 70.6%) and suicides (229, 25.6%). Notably, of the total number of homicides and suicides reported in 2019, 10 victims (1.1%) were recorded in five homicide-suicide incidents. Homicide-suicide incidents are those where the aggressor, after killing the victim, commits suicide. In addition, 10 violent deaths attributed to legal intervention incidents (1.1%), three unintentional self-inflicted violent deaths by firearms (0.3%) and one unintentional death inflicted by another person (0.1%) were documented. Finally, 20 violent deaths with undetermined intent were documented (2.2%). Table 2 shows the distribution of all violent deaths that occurred in 2019 by incident type and sex and Figures 4a and 4b illustrate the relative distribution of these violent deaths in males and females, respectively. Approximately 9 out of 10 of violent death victims (89.7%) were male.

The crude violent death rate for Puerto Rico in 2019 is 28.0 per 100,000 population, 52.9 in men and 5.5 in women. The estimated lifetime risk of a violent death (cumulative to age 74), is 1 in every 63 inhabitants, 1 in every 33 males and 1 in every 666 females. The primary mechanism of all violent deaths was the use of firearms. Approximately, seven out of ten fatal incidents (n=623, 69.7%) involved a firearm. Of these deaths, 95.0% occurred in males (n=592) and 5.0% in females (n=31). The majority of violent deaths involving firearms were homicides (n=570, 91.5%) compared to suicides (n=29, 4.7%). In homicide-suicide incidents, 1.3% (n=8) of deaths were by firearm. There were 10 documented cases of violent firearm deaths by legal intervention (1.6%), three unintentional self-inflicted (0.5%), one unintentional inflicted by another person (0.2%), and one with undetermined intent (0.2%).

Since 96.2% of all violent deaths in 2019 in Puerto Rico were homicides and suicides, this report focuses on these two types of violent deaths.

Table 2. Number of victims by type of violent death incidents in Puerto Rico, 2019

Incident overall description and victims' manner of death	Victim's sex		
	Frequency		
	Men	Women	Total
Single homicide	491	23	514
Multiple homicide	95	13	108
Mutual homicide/shootout	~	0	~
Single homicide followed by suicide	~	~	10
Multiple homicide followed by suicide	0	0	0
Single suicide	180	44	224
Single legal intervention death	8	0	8
Multiple legal intervention death	~	0	~
Unintentional firearm death (self-inflicted)	~	~	~
Unintentional firearm death (inflicted by other person)	~	0	~
Unintentional firearm death (unknown who inflicted)	0	0	0
Single death of undetermined intent	15	~	20
Total	802	92	894

Notes:

*Three suicides were reported after the closing date of the 2019 database and are not included in the analysis.

~Number is not presented when fewer than six cases are reported to ensure the confidentiality of the information.

Figura 4a. Percent distribution of violent death incidents among men in Puerto Rico, 2019

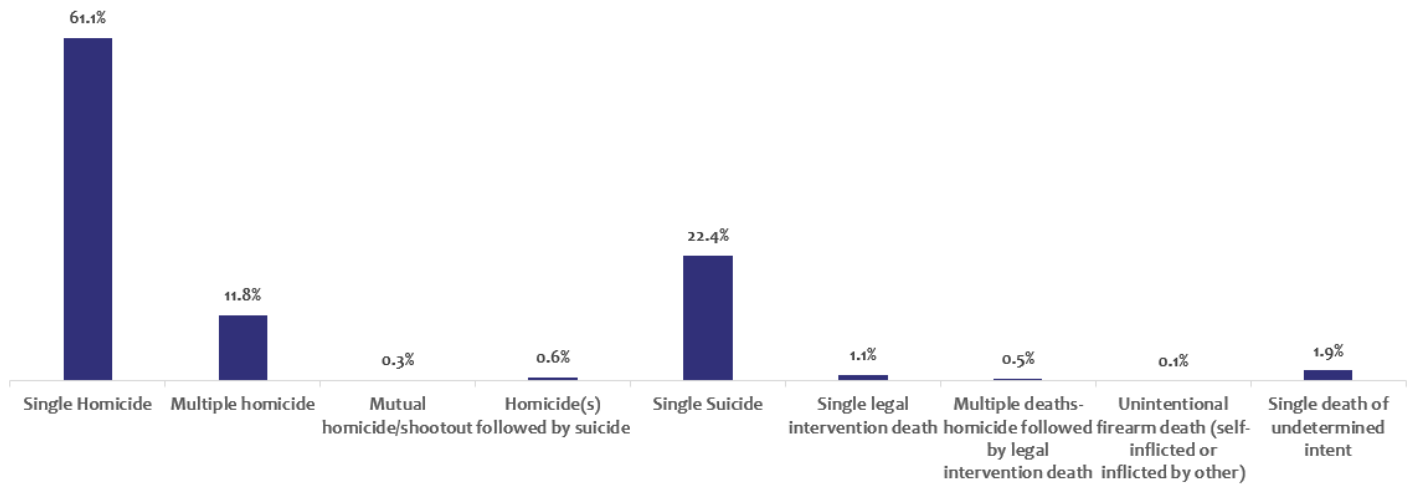
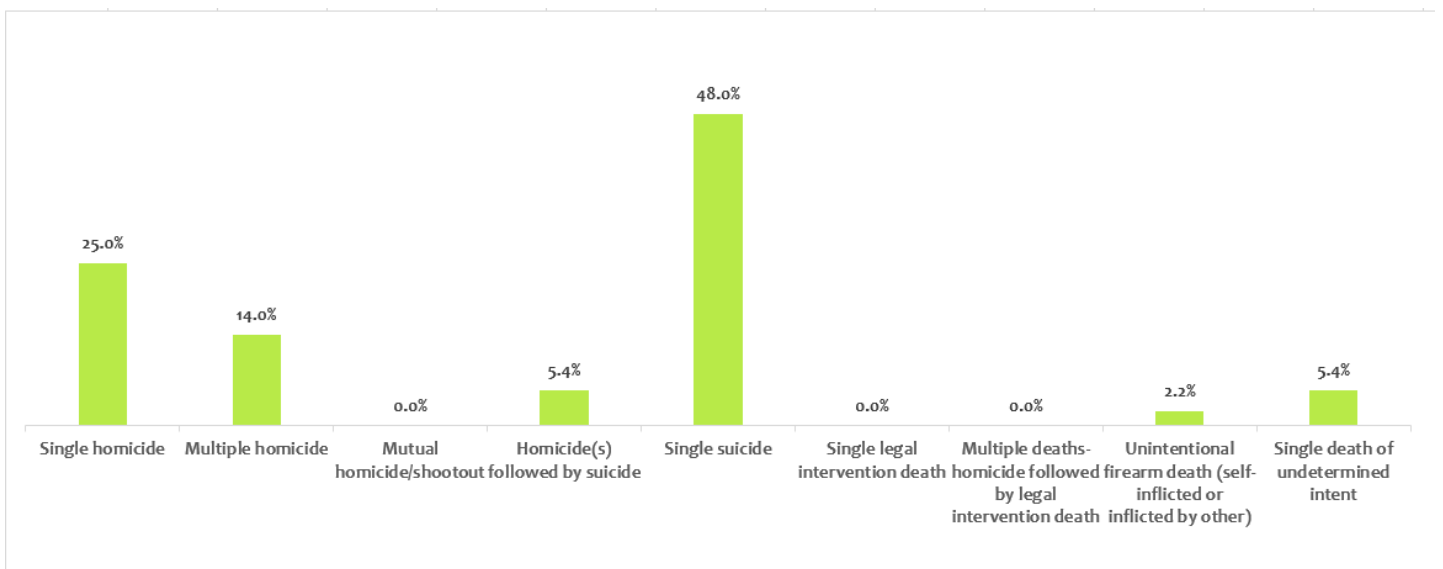


Figura 4b. Percent distribution of violent death incidents among women in Puerto Rico, 2019



VIOLENT DEATHS IN PUERTO RICO 2019
HOMICIDES

Homicides

Of the 894 violent deaths recorded in 2019, 631 were homicides (70.6%). Homicides were more frequent in males (n=590, 93.5%) than in females (n=41, 6.5%). This gender profile has been maintained for years. According to historical data from the Institute of Forensic Sciences, and as presented in Figure 5, between the years 2000 to 2016 and adding the PRVDRS data from 2017 to 2019, a total of 16,434 homicides have been recorded; 15,258 in males (92.8%) and 1,172 in females (7.1%). Gender could not be established for three victims in 2014 and one victim in 2011.

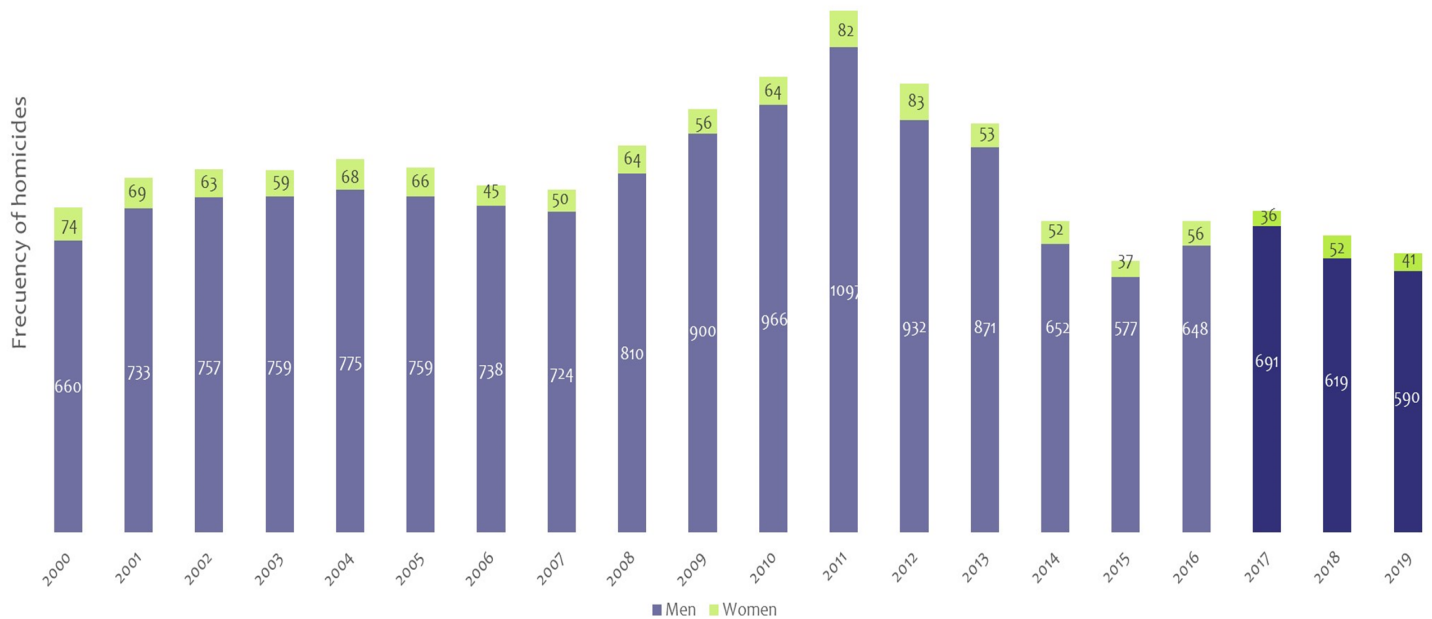
Figure 6 shows the trend of annual homicide rates for the period from 2000 to 2019. During this period, the highest homicide rates were recorded in 2011 with 32.1 homicides per 100,000 population, 62.0 per 100,000 males and 4.3 per 100,000 females. The crude female homicide rate during the years 2000 to 2019 has fluctuated, with the lowest recorded in 2015 (2.0 per 100,000 females) and the highest in 2012 (4.4 per 100,000 females). During 2016 and 2017, an increase in the crude homicide rates for males was observed. By 2019, the homicide rate decreased to 19.8 per 100,000 population (38.9 in males and 2.4 in females). According to this data, the risk of dying from homicide in 2019 for men was approximately 13 times higher than the risk for women (RR=16.2). Similar results were obtained using age-adjusted rates.

Demographic Profile of Homicides

Age and Sex

To compare Puerto Rico with other populations in the U.S. and other countries, the rates for age and sex were adjusted using the U.S. Standard Population (2000) and the World Standard Population (2000). Table 3 includes the calculation of the cumulative rate and the approximation of the accumulated risk up to 74 years of age (life-time risk). This statistic does not consider the risk for other causes of death, but it is more easily interpretable and comparable among populations even with different age structures. The highest homicide rates were recorded in 2011, where the cumulative risk was 1 in 42 inhabitants, 1 in 22 males and 1 in 315 females. In 2019, the cumulative risk decreased to 1 in every 66 inhabitants, 1 in every 35 males and 1 in every 517 females.

Figure 5. Number of homicides by sex: Puerto Rico, 2000-2019*



*1 homicide in 2011 and 3 in 2014 have no sex classification

Figure 6. Homicide crude rates by sex: Puerto Rico, 2000 - 2019

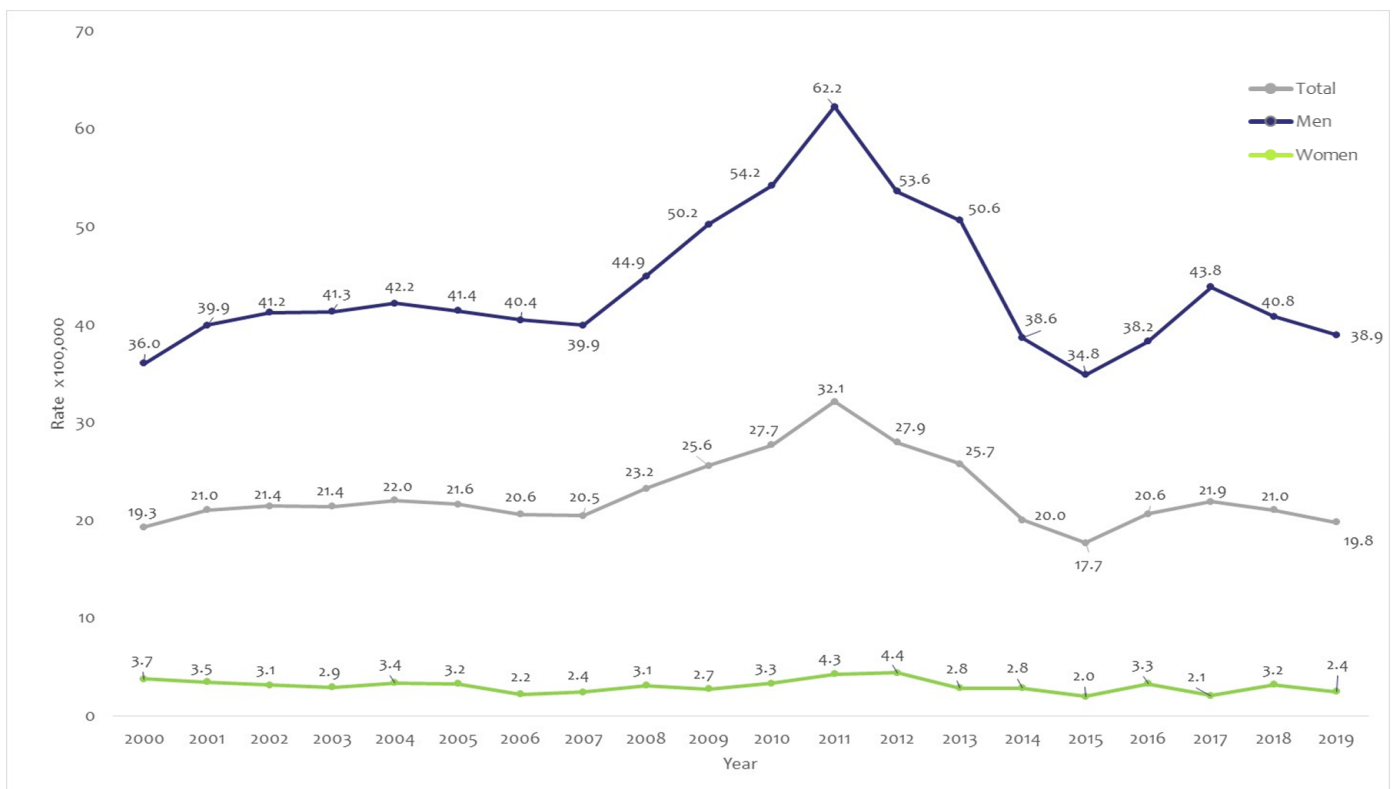


Table 3. Number and rates for homicides by age and sex: Puerto Rico, 2019

Age group	Number of cases			Rate x 100,000		
	Sex			Sex		
	Men	Women	Total	Men	Women	Total
0-4	~	0	~	~	0	~
5-9	0	0	0	0	0	0
10-14	~	~	~	~	~	~
15-19	33	~	35	32	~	17.4
20-24	112	~	115	101.9	~	53.1
25-29	134	7	141	122.1	6.4*	64.1
30-34	69	9	78	76.9	9.4*	42.1
35-39	72	~	77	80.7	~	40.6
40-44	61	6	67	64.8	5.7*	33.7
45-49	41	~	44	42.4	~	21.6
50-54	27	~	29	27.3	~	13.7
55-59	13	~	14	13.0*	~	6.4*
60-64	7	~	8	7.3*	~	3.8*
65-69	7	0	7	8.2*	0	3.7*
70-74	~	0	~	~	0	~
75-79	~	0	~	~	0	~
80-84	~	0	~	~	0	~
85+	~	~	~	~	~	~
Unknown	3	0	3			
Total	590	41	631	38.9	2.4	19.8
Age-Adjusted rate (US 2000)				40.9	2.8	21.4
Age-Adjusted rate (World 2000)				42.5	2.8	22.2
Cumulative Rate to 74 years of age (%)				2.94	0.19	1.53
Cumulative Risk (1 in ...)				35	517	66
Age Groups:						
Relative Risk (RR)		15-19	20-24	25-29	30-34	35-39
Men:Women		15.8	36.2	19.2	8.2	16.2

Notes:

~Number or rates are not presented when fewer than six cases are reported to ensure the confidentiality of the information.

*Rates calculated with fewer than 20 observations are unreliable and should be interpreted with caution.

Age-specific rates are important for identifying groups at higher risk of dying due to homicide. Figure 7 shows the specific rates by age and sex groups. The contrast in homicide rates by sex in the 15-39 age groups is striking (framed in Figure 7). In these age groups 71.2% of all homicides occurred in males and 63.4% in females. The bottom of Table 3 shows the higher risk of dying from homicide for males between 15 and 39 years of age, relative to the risk for females.

Table 4 compares the risk of homicide deaths in Puerto Rico with the White, Hispanic, African American, and Native American populations in the U.S. (National Center for Injury Prevention and Control, 2022). Comparing the homicide rates of all populations relative to the white population, the risk of dying from homicide for men in Puerto Rico was the highest (11.2). This risk was even higher than that of the African-American male population, whose risk of dying from homicide was 10.9 times that of white males in the U.S. The risk of dying from homicide for women in Puerto Rico was 1.6 times higher than that of white women in the United States. However, this risk was lower than that of Native American (3.5) and African American (3.5) women. In addition, Hispanic women had the same risk as white women in the U.S.

Figure 7. Homicide death rates by age and sex: Puerto Rico, 2019

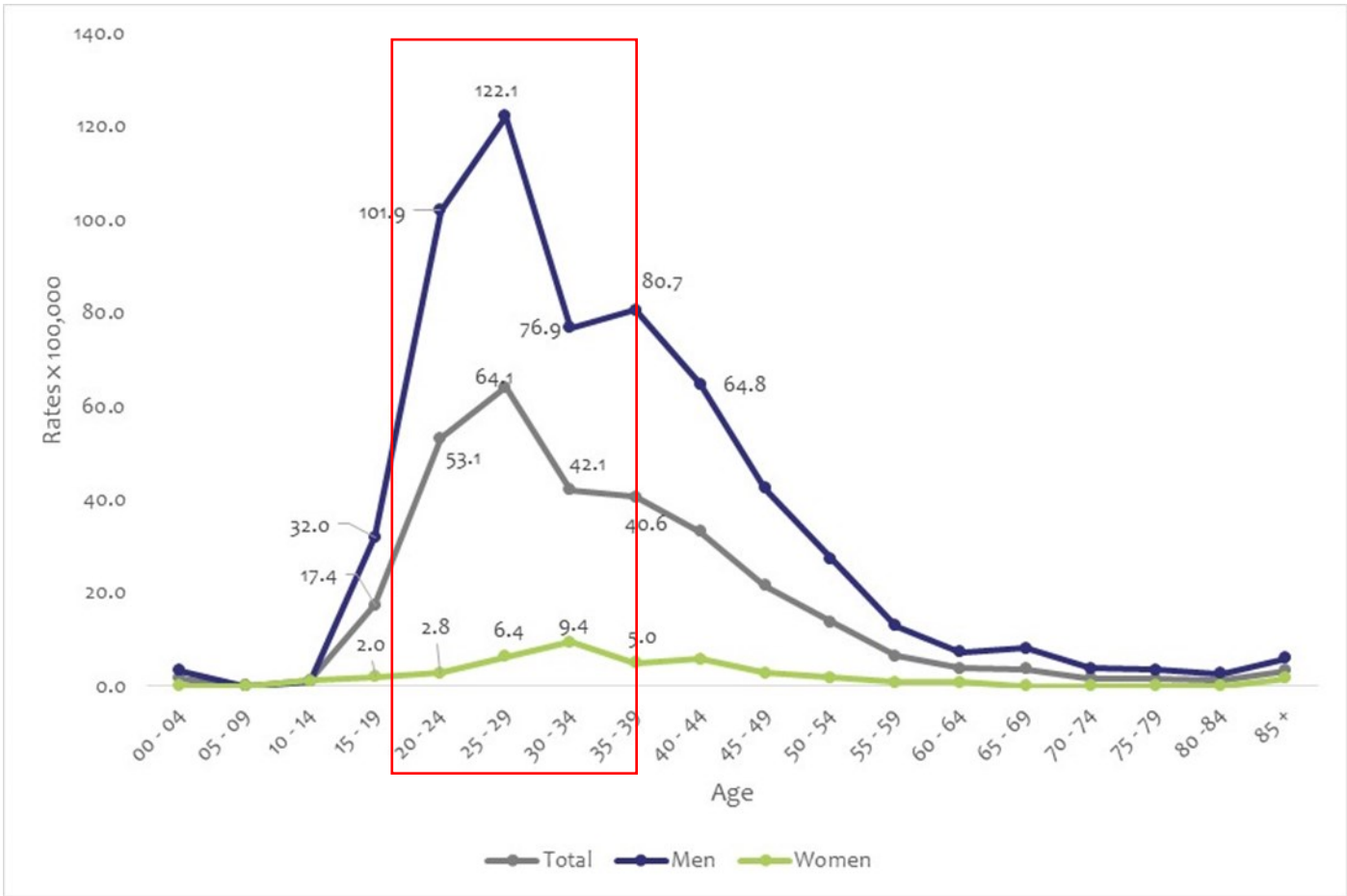


Tabla 4. Age adjusted homicide rates (US 2000) : Puerto Rico and US populations , 2019

Homicides						
Men						
Race Ethnicity	No. of Deaths	Population	Crude Rate (per 100,000)	Age Adjusted Rate (per 100,000)	RR	
White, Non-Hispanic	3,537	99,067,198	3.57	3.67	1.0	
Hispanic	2,534	30,474,941	8.32	7.86	2.1	
African American, Non-Hispanic	8,679	20,757,246	41.81	39.82	10.9	
American Indian, Non-Hispanic	234	1,349,005	17.35	17.51	4.8	
Puerto Rico, Hispanic, all races	590	1,515,598	38.93	40.97	11.2	
Women						
Race Ethnicity	No. of Deaths	Population	Crude Rate (per 100,000)	Age Adjusted Rate (per 100,000)	RR	
White, Non- Hispanic	1,727	101,830,782	1.70	1.72	1.0	
Hispanic	588	29,929,546	1.96	1.97	1.1	
African American Non-Hispanic	1,351	22,562,116	5.99	6.03	3.5	
American Indian, Non-Hispanic	82	1,404,036	5.84	5.99	3.5	
Puerto Rico, Hispanic, all races	41	1,677,955	2.46	2.79	1.6	

Education

Table 5 shows the highest level of education attained by homicide victims, disaggregated by sex. The majority of homicide victims did not complete education beyond high school. These basic levels of education comprise 76.1% of all homicide victims. Figure 8 shows the percentage distribution of education for these victims by sex. An 77.3% of men and 58.5% of women did not complete higher levels of education than secondary school.

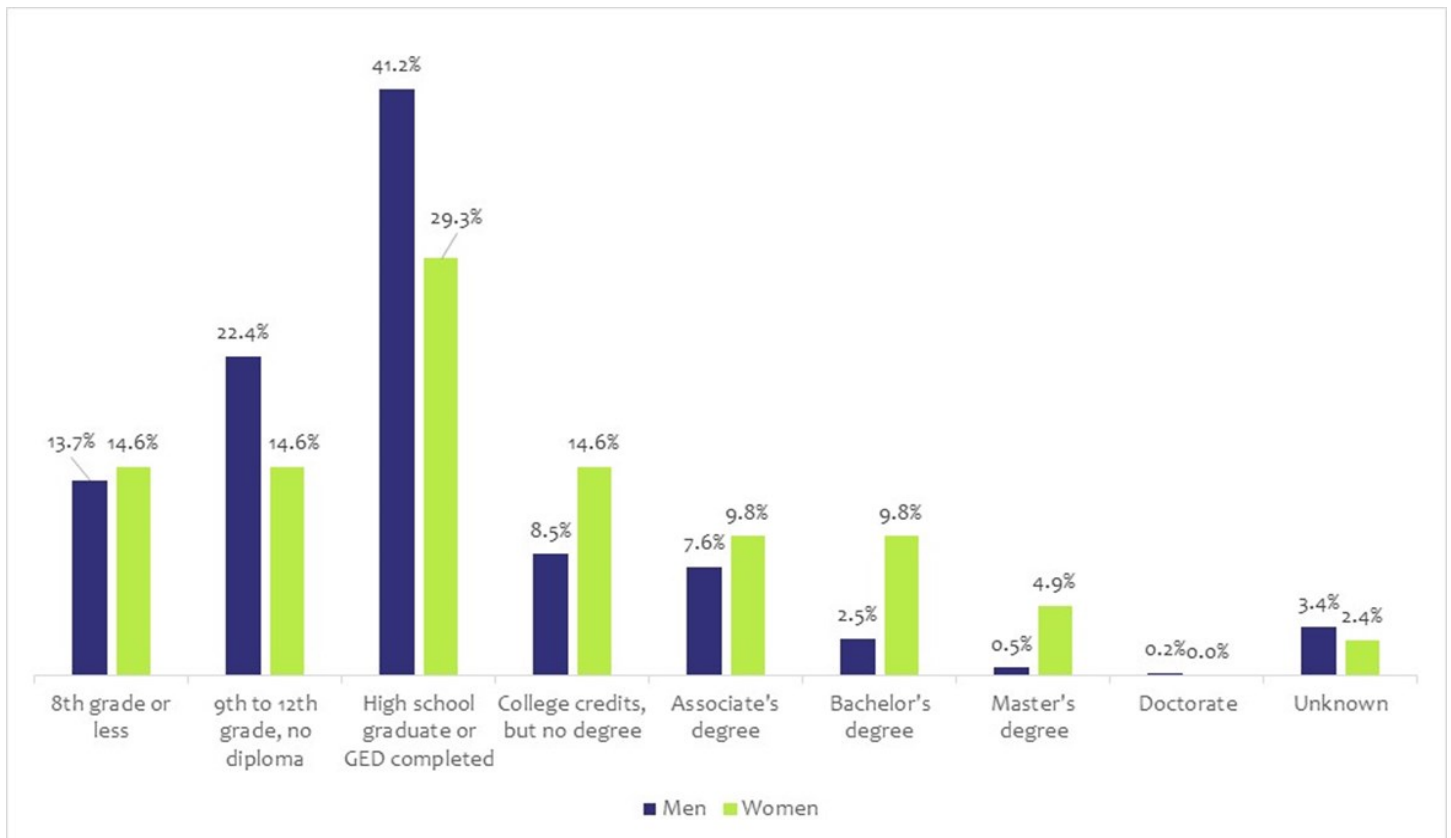
Current Occupation

For 39.2% of male and for 26.8% of female homicide victims, the current occupation information was unknown. The proportion of victims with employment in men (46.7%) was similar to that in women (46.7%). 26.2% of men and 3.3% of women never worked and 36.7% of women were identified as housewives.

Table 5. Highest educational level attained by the homicide victims: Puerto Rico, 2019

Highest educational level attained	Sex of the victim		
	Men	Women	Total
8th grade or less	81	6	87
9th to 12th grade, no diploma	132	6	138
High school graduate or GED completed	243	12	255
College credits, but no degree	50	6	56
Associate's degree	45	4	49
Bachelor's degree	15	4	19
Master's degree	3	2	5
Doctorate	1	0	1
Unknown	20	1	21
Total	590	41	631

Figure 8. Highest educational level attained by homicide victims: Puerto Rico, 2019



Mechanism

Historically, the use of firearms has been the primary mechanism of homicides in Puerto Rico (Zavala, et al; 2012). Data from the Institute of Forensic Sciences from 2000 to 2016 and PRVDRS data from 2017 onwards reflect that the use of firearms to inflict fatal injuries increased from 83.8% in males and 54.1% in females in 2000, to 92.5% in males and 68.3% in females in 2019. Table 6 shows all mechanisms used in homicides by sex for the year 2019.

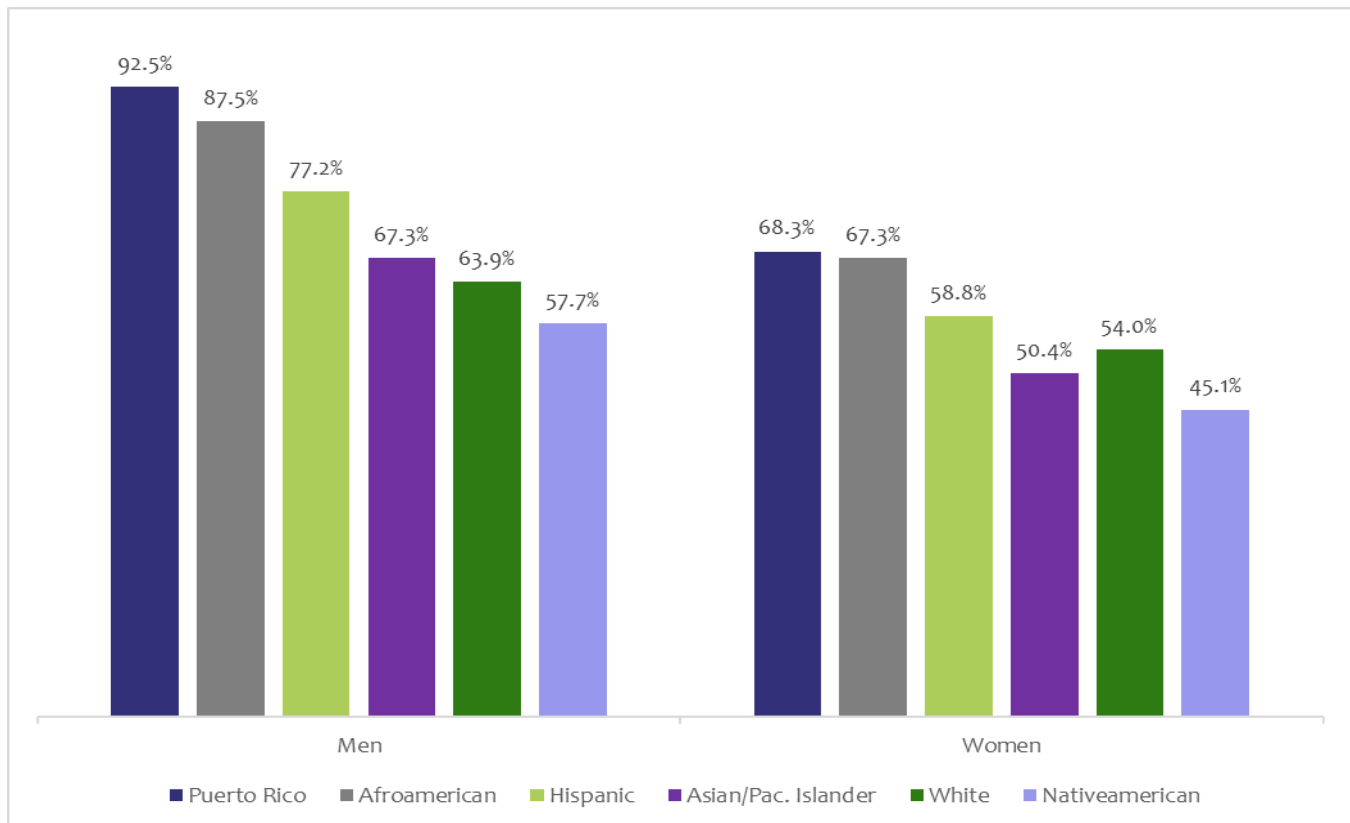
Figure 9 shows the proportion of homicides by firearms for four racial groups in the U.S. compared to Puerto Rico (National Center for Injury Prevention and Control, 2022). Comparing the 2019 firearm homicides in Puerto Rico and the U.S. populations described previously shows that Puerto Rico had the highest proportion for males (92.5%) and females (68.3%). Similar data worldwide indicate that in 2019 on average, firearms were used in 42.7% of homicides. In the Latin American and Caribbean regions, Puerto Rico (92.5%), Venezuela (85.3%), and Guatemala (82.1%) had the highest levels of firearms use, while Canada (30.8%), Grenada (11.7%), and Cuba (4.9%) had the lowest levels (GBD, 2019).

Table 7 shows the age- and sex-adjusted firearm homicide rates for Puerto Rico and the U.S. population groups mentioned previously (National Center for Injury Prevention and Control, 2022). The risk of being a

Table 6. Primary weapon type or mechanism used to inflict the fatal injury: Puerto Rico, 2019

Mechanism	Sex of the victim		
	Men	Women	Total
Firearm	546 (92.5%)	28 (68.3%)	574 (91.0%)
Sharp instrument	18 (3.1%)	7 (17.1%)	25 (4.0%)
Blunt instrument	3 (0.5%)	1 (2.4%)	4 (0.6%)
Poisoning	4 (0.7%)	0 (0%)	4 (0.6%)
Personal weapon (hands, fists, etc.)	8 (1.4%)	3 (7.3%)	11 (1.7%)
Fall	1 (0.2%)	0 (0%)	1 (0.2%)
Fire or burning	5 (0.8%)	1 (2.4%)	6 (1.0%)
Other	1 (0.2%)	0 (0%)	1 (0.2%)
Unknown	4 (0.7%)	1 (2.4%)	5 (0.8%)
Total	590	41	631

Figure 9. Proportion of homicides by firearms: Puerto Rico and US populations, 2019



victim of firearm homicide for Puerto Rican men is approximately 16 times higher than the risk for white men in the U.S. In second place are African-American men with a risk 14 times higher than that of white men in the U.S. Puerto Rican women have 2.0 times the risk of dying from firearm homicide compared to white women in the U.S. (1.0). The adjusted death rate from firearm homicide for women in Puerto Rico was 1.84. The data reflect that African American women have the highest firearm homicide rates (4.07) of all populations compared and have 4.3 times the risk of dying by firearm compared to white women in the U.S.

Figure 10 shows the age-group-specific firearm homicide rates for males for Puerto Rico and the four U.S. populations described above. The male population in Puerto Rico between the ages of 20 and 54 years has the highest risk of homicide death of any population in the United States, particularly between the ages of 20 and 29 years, where the rates were 100 homicides or more per 100,000 males. This risk of homicide in young men is the same pattern observed primarily in Latin America and the Caribbean (IHME, 2018).

Circumstances

As a result of the criminal and forensic investigation of homicide incidents, multiple circumstances related to the crime may be identified. Information on the circumstances in which homicides occur include interpersonal relationships between victims and suspects, the circumstances of the crime, and the circumstances related to the mental health of the victims, among others.

Interpersonal Violence

Interpersonal violence can be defined according to the relationship of the victim with the perpetrator delineated in two circumstances: family violence and community violence. Family violence (violence between family members), includes abuse of minors or the elderly, and intimate partner violence. Community violence occurs between people without any family relationship and who may be strangers or acquaintances (Krug, Dahlberg & Mercy, 2002).

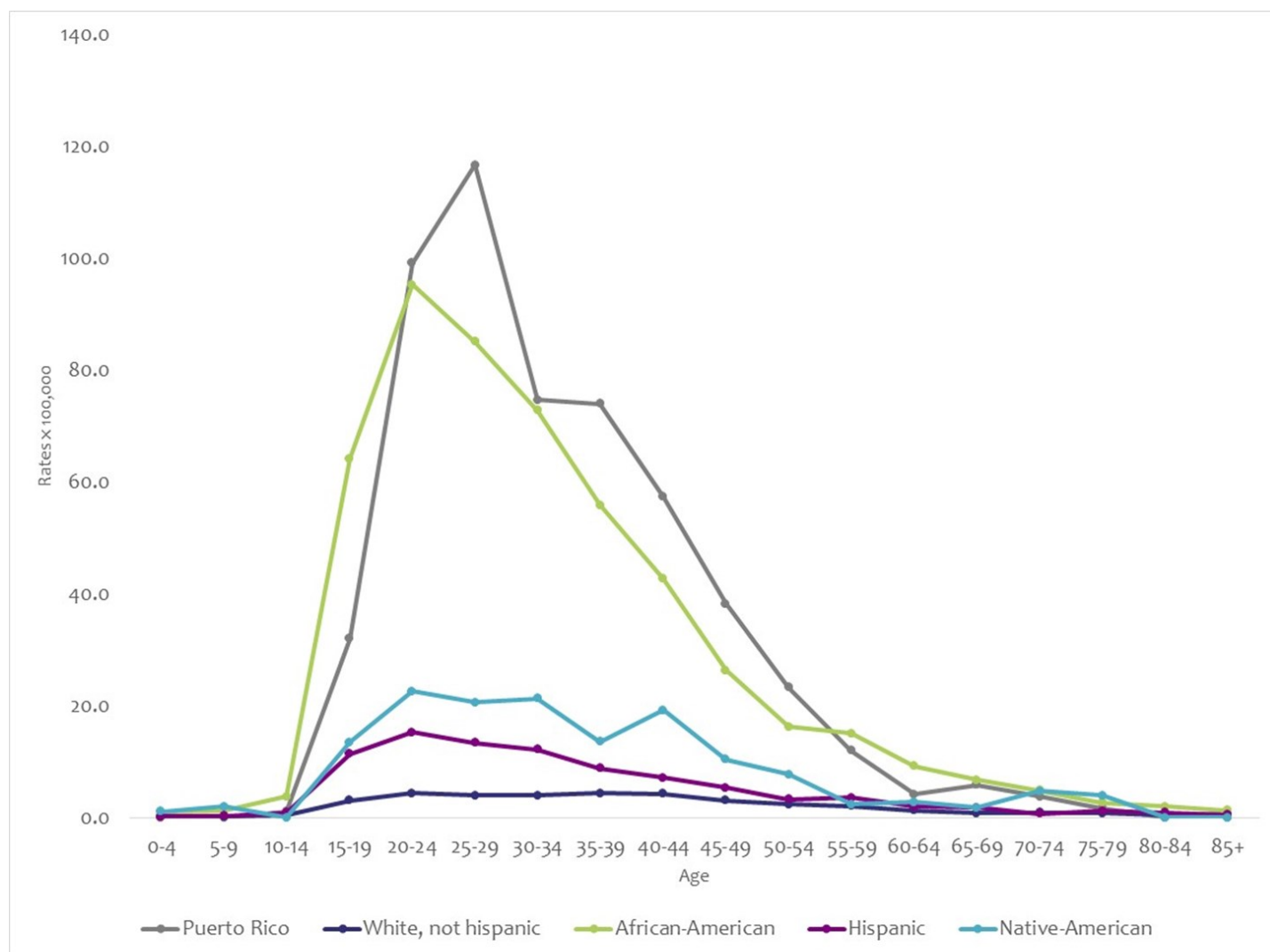
Family violence

In 2019, 29 fatal victims of family violence were reported. Most of these cases were related to violence in an intimate partner or ex-partner setting (17 cases, 58.6%). Violence between family members (12 cases, 41.4%), occurred mainly during an argument (63.6%).

Table 7. Age adjusted firearm homicide rates (US 2000): Puerto Rico and US populations, 2019

Firearm Homicides						
Race Ethnicity	Men			Crude Rate (per 100,000)	Age Adjusted Rate (per 100,000)	Age Adjusted Rate
	No. of Deaths	Population				
White, Non-Hispanic	2,261	99,067,198		2.28	2.42	1.0
Hispanic	7,590	20,757,246		36.57	34.59	14.3
African American, Non-Hispanic	1,955	30,474,941		6.42	5.94	2.5
American Indian, Non-Hispanic	135	1,349,005		10.01	9.98	4.1
Puerto Rico, Hispanic, all races	546	1,515,598		36.03	38.02	15.7
Race Ethnicity	Women			Crude Rate (per 100,000)	Age Adjusted Rate (per 100,000)	RR
	No. of Deaths	Population				
White, Non-Hispanic	932	101,830,782		0.92	0.94	1.0
Hispanic	909	22,562,116		4.03	4.07	4.3
African American, Non-Hispanic	346	29,929,546		1.16	1.15	1.2
American Indian, Non-Hispanic	37	1,404,036		2.64	2.77	3.0
Puerto Rico, Hispanic, all races	28	1,677,955		1.67	1.84	2.0

**Figure 10. Age specific firearm homicide rates in men:
Puerto Rico and US populations, 2019**



Intimate Partner Violence (n = 17)

The PRVDRS uses the World Health Organization's definition of intimate partner violence. This definition is widely used internationally to refer to violence perpetrated by spouses, partners, or friends involved in a current or past close personal or sexual relationship. Intimate partner violence includes not only violence against women, but also violence by women against men and between same-sex partners (Krug, Dahlberg & Mercy, 2002). The United Nations defines femicide/feminicide as the gender-related killing of women that can take many forms including intimate partner homicide (UN, 2012), recognizing that femicides/feminicides are an extreme manifestation of violence against women perpetrated or condoned by public and private actors (Grzyb et al., 2018).

Most of the victims of intimate partner violence were women (n = 15, 88.2%). More than half of these women were victims of their current spouse or partner (53.3%), while 46.7% were victims of their ex-spouse or ex-partner. In addition, five of the victims of the 17 fatal cases of intimate partner violence were homicide-suicide incidents (29.4%). These femicides/feminicides occurred primarily during an argument (42.9%) or due to jealousy over a current or former intimate partner relationship (28.6%). It should be noted, that in one of the femicide/feminicide incidents in 2019, an indirect victim was reported. In the case of the two male intimate partner homicides, the relationship between the suspect and the victim was female-male where both victims were in a current intimate partner relationship.

The two main mechanisms of all intimate partner homicides were firearms (41.2%) and a sharp instrument (35.3%). In seven of the 15 femicides/feminicides a firearm was used (46.7%) and in five femicides/feminicides a sharp instrument was used (33.3%). One femicide/feminicide was by burns, another by a personal weapon (fists) and in another the mechanism is unknown. In the two male victims of intimate partner violence, the mechanism was a sharp object and a blunt object, respectively.

On the other hand, within the context of intimate partner violence, there were 22 deaths of a third party who was directly linked to a current or past intimate relationship (e.g., the current partner of the suspect's ex-partner, the ex-partner of the suspect's current partner, the child of the intimate partner, a friend of the victim, a bystander, etc.). In these cases, the majority of victims were male (n=21) and the use of a firearm predominated (95.7%).

Community Violence

There are 579 documented victims of homicides in multiple circumstances in the community representing 91.8% of all homicides (excluding 10 deaths due to legal intervention). The victims of these incidents are primarily males (n=558, 96.4%), between the ages of 15-49 (n=497, 89.1%). A firearm was used in 93.3% of male homicides. In the case of female victims of community violence (n=21, 3.6%), the majority were between 15 and 49 years of age (n=18, 85.7%). A firearm was used in 90.5% of the female homicides.

Crime Circumstances

The most frequent criminal circumstances in homicides in Puerto Rico are related to illegal drug trafficking and organized crime. According to the Drug Enforcement Administration (DEA), Puerto Rico and the Virgin Islands are designated as High Intensity Drug Trafficking Areas (HIDTAs) for being major maritime transshipment points for marijuana and cocaine (DEA, 2019). The DEA recognizes a "strong connection" between violent crime, illicit drug trafficking, gang activity, and illicit weapons possession (DEA, 2017).

Of the 579 homicides that occurred in the community, 309 (53.5%) were related to drug trafficking and/or organized crime. The rest were related to an environment of arguments, grudge, revenge, physical fight, robbery or innocent victims. In addition, in 2019, there were 124 homicide victims in drive-by shootings (21.4%). Of these, 83 (66.1%) were related to confrontations between organized crime and/or drug trafficking rivals. Firearms were used in virtually all homicides related to organized crime and/or drug trafficking (97.7%).

Firearms, Ammunition and Drug Trafficking

Access to firearms is a determining factor in the homicides that occur in Puerto Rico. Restrictions on legal access to firearms continue to be stricter than in many U.S. jurisdictions (Puerto Rico Firearms Statutes and Codes, ATF). However, in neighboring states, such as Florida, the purchase of firearms is less restricted, so the accessibility of these weapons in Florida extends to Puerto Rico (Zavala et al., 2012). The 2019 report from the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF, 2019) Firearms Tracing System provides detailed information on 1,128 firearms recovered for tracing. The majority of these guns were pistols or revolvers (86.1%) and more than half of these guns were .40 caliber, 9mm, and .45 caliber (70.8%).

The ATF report reported that the largest number of firearms for tracing were guns that were under investigation (n=414, 36.7%) or confiscated for illegal possession (n=354, 31.4%) . Only five guns (0.4%) traced were involved in homicides. This last figure reflects the fact that firearms are not recovered in the vast majority of homicide scenes. However, numerous shell casings are recovered at these scenes and sent to the Institute of Forensic Sciences for analysis through the National Integrated Ballistics Information Network (NIBIN).

In 814 of the 1,128 (72.2%) firearms analyzed by the ATF, the state of origin of the firearm was identified, with Florida being the state with the highest proportion (43.1%) of firearms origin in Puerto Rico. While 23.1% of the firearms traced originated in Puerto Rico (ATF, 2019).

According to a Small Arms Survey report, in 2017 it was estimated that 422,00 firearms were in legal (registered by the Police) and illegal possession in Puerto Rico; that is, approximately 12 out of every 100 people owned a firearm (Small Arms Survey, 2018). This number contrasts with the large number of ammunition available annually in Puerto Rico. According to Puerto Rico's foreign trade statistics, 12,710,6755 cartridges with projectiles for shotguns, rifles, or pistols were imported in 2019 (PR Planning Board, 2019).

Mental Health Circumstances

Most homicide incidents had no available or documented mental health history information. Table 8 shows the available mental health history documented in homicide victims. The percentage of each circumstance is in relation to the total number of homicides. The most documented circumstance in homicide victims was a non-alcohol substance abuse problem (15.8%). In addition, 6.3% of victims were documented as having a current mental health problem and 4.4% of victims were perceived by others to be depressed.

Table 8. Mental health circumstances in victims of homicides: Puerto Rico, 2019

Mental Health Problems in Homicides	Victim's sex		
	Men	Women	Total
Victim had a non-alcohol related substance abuse problem	92 (15.6%)	8 (19.5%)	100 (15.9%)
Victim had been identified as currently having a mental health problem	36 (6.1%)	4 (9.8%)	40 (6.3%)
Victim was perceived by self or others to be depressed at the time of the injury	27 (4.6%)	1 (2.4%)	28 (4.4%)
Victim had alcohol dependence or alcohol abuse problem	14 (2.4%)	4 (9.8%)	18 (2.9%)
History of ever being treated for a mental health or substance abuse problem	16 (2.7%)	1 (2.4%)	17 (2.7%)
Currently in treatment for mental health problem or substance abuse	14 (2.4%)	1 (2.4%)	15 (2.4%)
N	590	41	631

VIOLENT DEATHS IN PUERTO RICO 2019 SUICIDES

Suicides

The U.S. National Strategy for Suicide Prevention proposes the public health approach for the implementation of suicide prevention strategies recognizing that suicides are caused by multiple factors (OSG, 2012). This public health approach means that prevention strategies should consider the multiple levels of influence in the life of an individual, which includes in addition to personal factors, factors related to family and personal relations, community and society factors (Krug, Dahlberg & Mercy, 2002).

The PRVDRS data contains information on the circumstances of deaths, which, in the case of suicides, includes data on the individual's mental health and other factors that could precipitate a fatal self-injury.

Figure 11 shows historical data from the Institute of Forensic Sciences from 2000 to 2016 and PRVDRS data from 2017 to 2019. In this 20-year period, 5,965 suicides were reported. In Puerto Rico, the frequency of suicides is much lower than that of homicides. However, as with homicides, suicides were more frequent in males (5,102, 85.5%) than in females (863, 14.5%).

Figure 12 shows the crude suicide rates by sex for the period 2000 to 2019. In this period, the highest rates in males and females were recorded in different years. In 2009, the crude suicide rate was 16.9 per 100,000 males (1 of 77 males) and 1.6 for females (1 of 777 females). In 2011, the highest female suicide rate was observed which was 3.2 per 100,000 females (1 of 399 females) compared to 14.9 for males (1 of 88 males). In 2019, the crude suicide rate was 7.2 per 100,000 population, 12.2 for males (1 of 112 males) and 2.6 for females (1 of 493 females). The risk of suicide in men was seven times higher than the risk of suicide in women.

Figure 11. Number of suicides by sex: Puerto Rico, 2000-2019

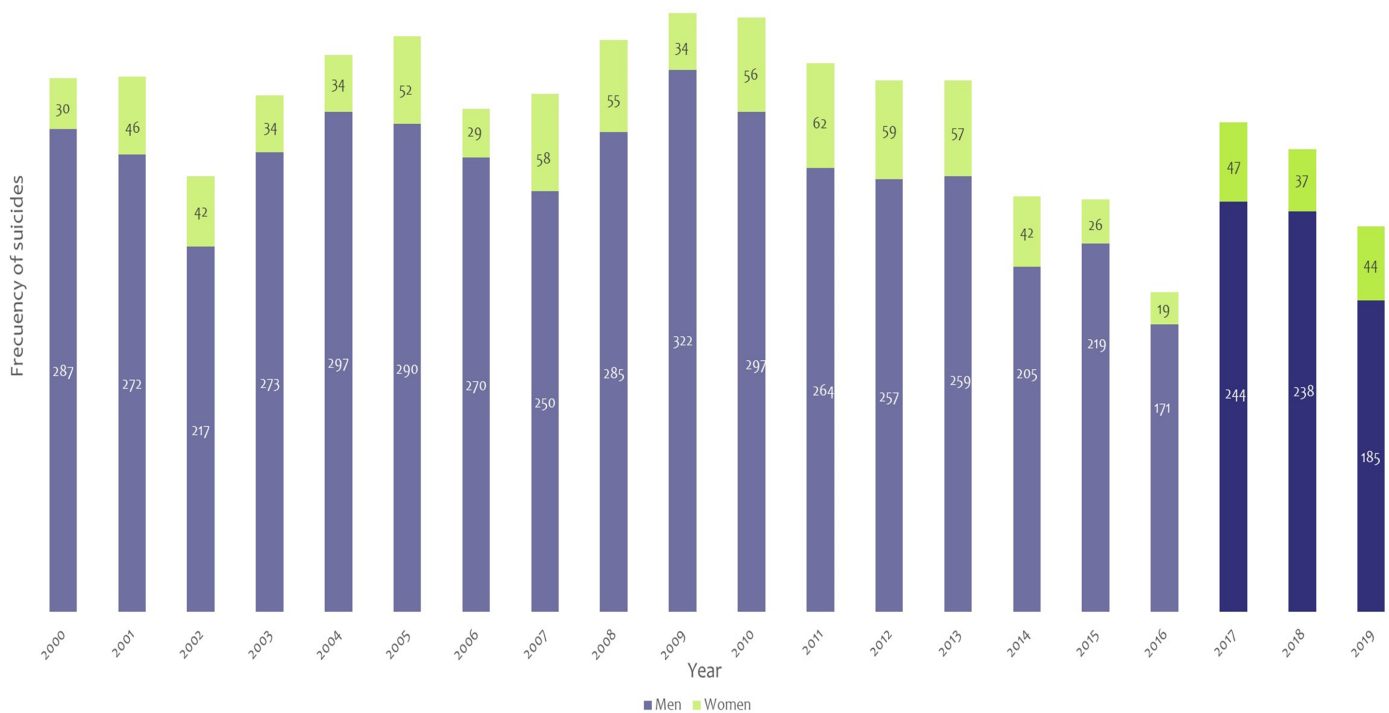
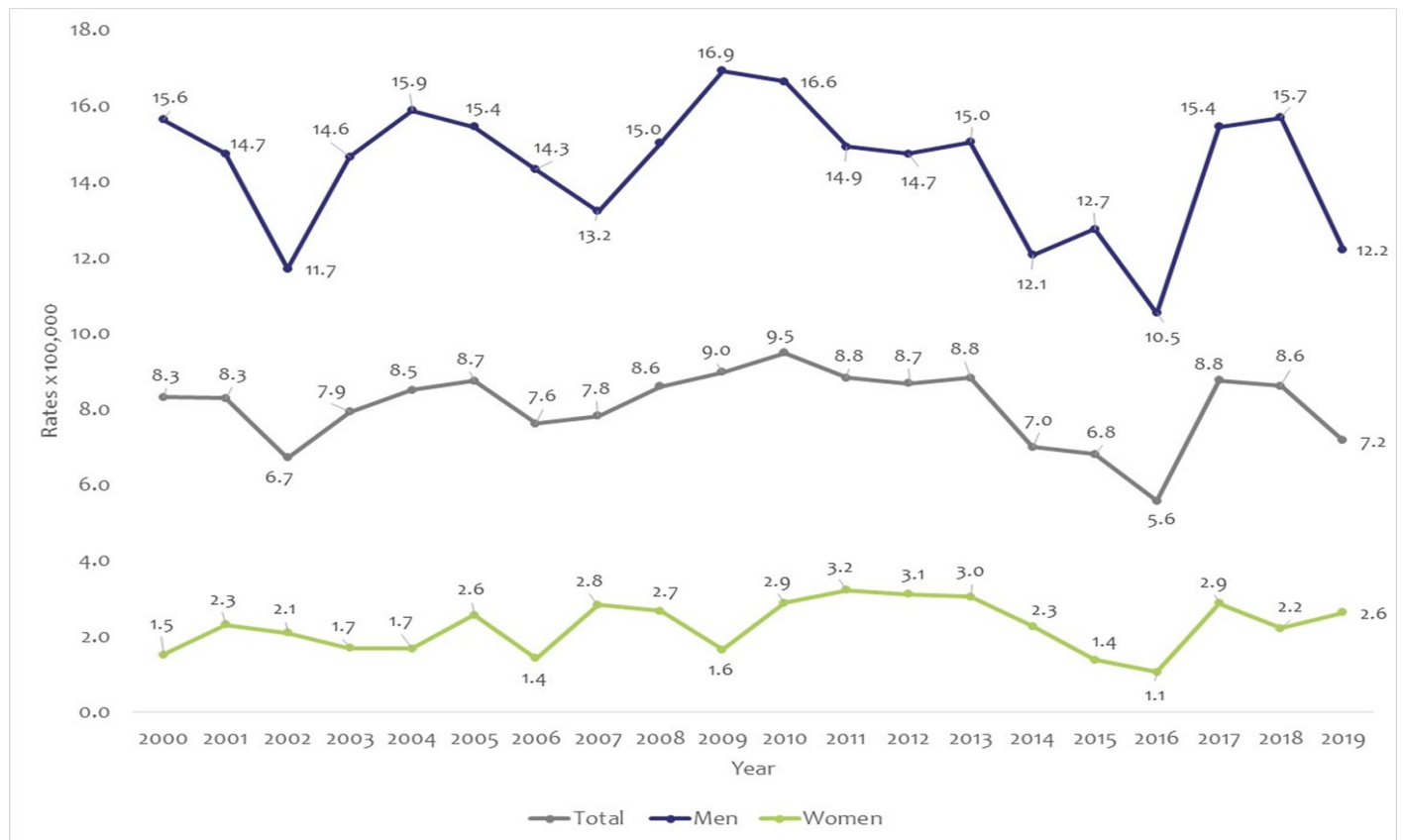


Figure 12. Suicide crude rates by sex: Puerto Rico 2000-2019



Age and Sex

To minimize the variability in the calculation of age specific rates, Table 10 shows age and sex specific number of cases and rates in 10 year intervals. Even then, age specific rates, especially in women are unstable and must be interpreted with caution. For comparison with other populations, Table 10 includes age adjusted rates using the U.S. Standard Population (2000) and the World Standard Population (2000).

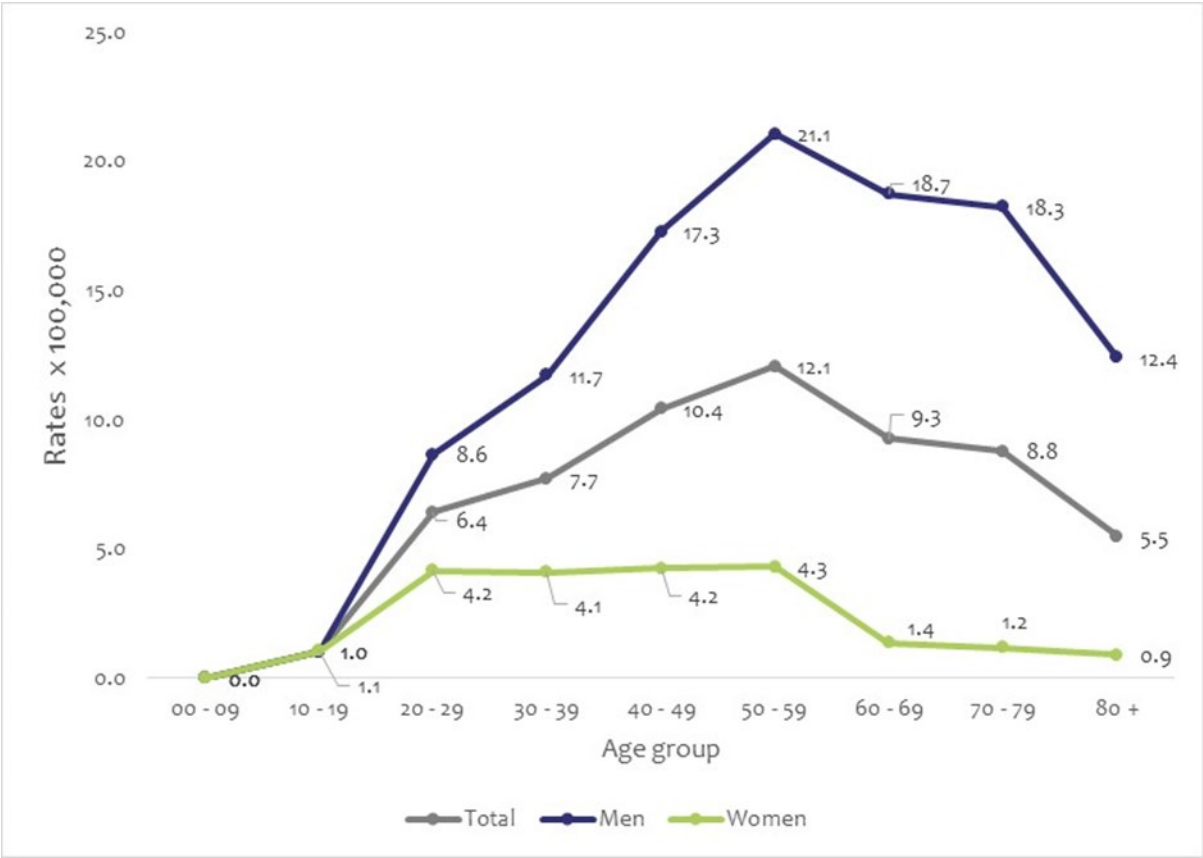
Table 9. Number and age-sex specific rates for suicides: Puerto Rico, 2019

Age Group	Number of cases			Rate x 100, 000				
	Sex			Sex				
	Men	Women	Total	Men	Women	Total		
0-9	0	0	0	0.0	0.0	0.0		
10-19	~	~	~	*1.0	*1.1	*1.0		
20-29	19	9	28	*8.6	*4.2	6.4		
30-39	21	8	29	11.7	*4.1	7.7		
40-49	33	9	42	17.3	*4.2	10.4		
50-59	42	10	52	21.1	*4.3	12.1		
60-69	34	~	37	18.7	1.4	9.3		
70-79	25	~	27	18.3	*1.2	8.8		
80 +	9	~	10	*12.4	*0.9	5.5*		
Desc.	0	0	0	-	-	-		
Total	185	44	229	12.2	2.6	7.2		
Age-Adjusted rate (US 2000)				11.0	2.7	6.6		
Age-Adjusted rate (World)				9.7	2.6	5.9		
Cumulative Rate to 74 years of age (%)				0.9	0.2	0.53		
Cumulative Risk (1 in ...)				112	494	191		
Age Group:								
Relative Risk (RR)	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
Men:Women	1.0	2.1	2.9	4.1	4.9	13.6	15.6	13.6

Note:
~Number or rates are not presented when fewer than six cases are reported to ensure the confidentiality of the information.
*Rates calculated with fewer than 20 observations are unstable and should be interpreted with caution.

Overall, 67.7% of all suicides occurred before the age of 60. Among males, 63.2% of suicides were observed before this age and 86.4% for females. Figure 13 shows the suicide mortality rates by age group and sex in 2019. Males between 50 to 59 years of age have the highest suicide rates (21.1 per 100,000 males). The highest rates in women are observed in the 50-59 age group (4.3 per 100,000 women). The highest risk of suicide in men relative to the risk in women is observed in the older age groups of 60-69, 70-79 and 80 or more years of age (relative risk 13.6, 15.6 and 13.6, respectively).

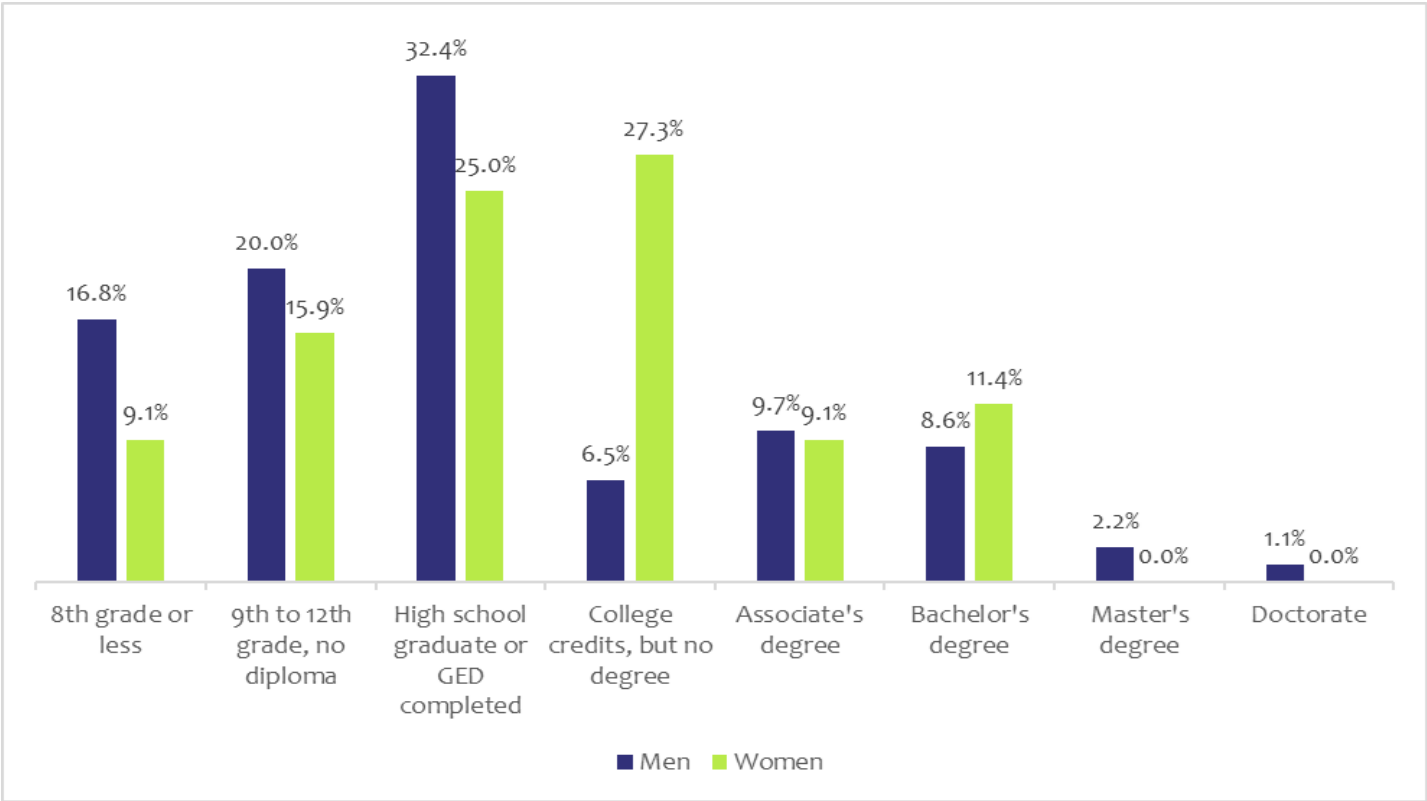
Figure 13. Suicide death rates by age and sex: Puerto Rico, 2019



Education

Figure 14 shows the percentage distribution of the highest level of education attained by sex. Similar to homicide victims, the majority of suicide victims (65.5%) did not obtain more than a high school education. Some 34.5% did not complete high school and 31.0% were able to graduate from high school or obtain a GED. An important observation is that 47.7% of female suicide victims had an associate's degree, initiated or completed college, while for male suicide victims it was 24.9%.

Figure 14. Highest educational level attained by the suicide victims: Puerto Rico, 2019



Mechanism

Compared to homicides, the use of firearms is not the most frequent mechanism used in suicides. Table 10 shows the mechanisms used in suicides in Puerto Rico by sex. The main mechanism is asphyxia (70.0% in men and 61.4% in women). The second most frequent mechanism in men was firearms (17.2%) and in women, poisoning (25.0%). The use of firearms by women is less frequent (2.3%). Poisoning is the third most frequent mechanism in men (5.4%) and fire or burns in women (4.5%).

Table 10. Mechanism used to inflict fatal injury in suicides: Puerto Rico, 2019

Mechanism	Sex of the victim		
	Men	Women	Total
Hanging, strangulation, suffocation	129 (69.7%)	27 (61.4%)	156 (68.1%)
Firearm	32 (17.3%)	1 (2.3%)	33 (14.4%)
Poisoning	10 (5.4%)	11 (25.0%)	21 (9.2%)
Fall	8 (4.3%)	1 (2.3%)	9 (3.9%)
Sharp instrument	2 (1.1%)	1 (2.3%)	3 (1.3%)
Fire or burns	0	2 (4.5%)	2 (0.9%)
Other (e.g. electrocution, motor vehicle, drowning)	3 (1.6%)	1 (2.3%)	4 (1.7%)
Unknown	1 (0.5%)	0	1 (0.4%)
Total	185	44	229

Circumstances

Documentation of the circumstances of suicides focused on the history of mental health problems, legal problems, financial problems, family problems, and problems at work. Table 11 shows the documented circumstances of suicides by sex. More males (33.5%) than females (29.5%) had a history of documented suicide attempts prior to the fatal incident. The proportion of men (25.9%) with a history of suicidal thoughts or plans is similar to that of women (25.0%).

In the suicide cases that occurred in 2019, the victim expressing thoughts and/or plans to end his or her life to another person was not very frequent. Only 9.2% of male suicide victims shared their suicide intentions in the past month more frequently to a family member (58.8%) than to their intimate partner (41.2%). On the other hand, only 6.8% of female suicide victims expressed their suicide intentions in the past month more frequently to their current or former partner (66.6%) than to a family member (33.3%). In 12.4% of men and 11.4% of women victims of suicide, health problem(s) appear to have contributed to the death. Finally, problems with a current or former intimate partner appear to have contributed to the suicide in 14.6% of male and 9.1% of female suicide victims.

Tabla 11. Suicide circumstances: Puerto Rico, 2019

Suicide circumstances	Men	Women	Total
Victim had a history of attempting suicide before the fatal incident	62 (33.5%)	13 (29.5%)	75 (32.8%)
Victim had a history of suicidal thoughts, plans or suicide attempts	48 (25.9%)	11 (25.0%)	59 (25.8%)
Victim disclosed to another person their thoughts and/or plans to end their life within the last month	17 (9.2%)	3 (6.8%)	20 (8.7%)
Previous or current intimate partner	7 (41.2%)	2 (66.6%)	9 (45.0%)
Other family member	10 (58.8%)	1 (33.3%)	11 (55.0%)
Victim's physical health problem(s) appear to have contributed to the death	23 (12.4%)	5 (11.4%)	28 (12.2%)
Victim left a suicide note	25 (13.5%)	9 (20.5%)	34 (14.8%)
Financial problems appear to have contributed to the death	11 (5.9%)	1 (2.3%)	12 (5.2%)
Death of a family member or a friend due to a cause other than suicide appears to have contributed to the death	5 (2.7%)	4 (9.1%)	9 (3.9%)
Job problem(s) appear to have contributed to the death	7 (3.8%)	1 (2.3%)	8 (3.5%)
Problems with a current or former intimate partner appear to have contributed to the suicide	27 (14.6%)	4 (9.1%)	31 (13.5%)
N	185	44	229

Table 12 shows the frequency of mental health-related circumstances documented in suicides that occurred in 2019. The most frequently reported circumstance was that the victim had been identified as having a current mental health problem, with the gender breakdown being 45.4% for males and 75.0% for females. Another frequent mental health-related circumstance was that the victim was perceived by self or others as depressed, 36.2% in men and 34.1% in women. A history of ever having been treated for a mental health or substance abuse problem was another frequent mental health circumstance, 31.4% in men and 54.5% in women.

Table 12. Mental Health Circumstances in suicides: Puerto Rico, 2019

Mental Health Problems in Suicides	Sex of the victim		
	Men	Women	Total
Victim had been identified as currently having a mental health problem	84 (45.4%)	33 (75.0%)	117 (51.1%)
Victim was perceived by self or others to be depressed at the time of the injury	67 (36.2%)	15 (34.1%)	82 (35.8%)
History of ever being treated for a mental health or substance abuse problem	58 (31.4%)	24 (54.5%)	82 (35.8%)
Victim was in treatment for a mental health problem or substance abuse problem	47 (25.4%)	20 (45.5%)	67 (29.3%)
Victim had alcohol dependence or alcohol problem	24 (13.0%)	3 (6.8%)	27 (11.8%)
Victim had a non-alcohol related substance abuse problem	21 (11.4%)	6 (13.6%)	27 (11.8%)
N	185	44	229

Mental Health Diagnosis and Suicides Related to Disasters

In 117 suicide victims there was documentation of one to three mental health diagnoses at the time of the fatal event, in 45.4% of males (n=84) and 75.0% of females (n=33). In 75.2% of the victims there was a single diagnosis, and in 24.9% there were two or three diagnoses. The most frequent diagnoses were depression or dysthymia, 69.0% in men and 78.8% in women, followed by schizophrenia, 23.8% in men, 9.1% in women, bipolar disorder, 15.1% in men, 21.2% in women, and anxiety, 8.3% in men and 15.2% in women.

Finally, in 2019, two additional suicides were documented related to the passage of Hurricane Maria that impacted Puerto Rico in September 2017. Previously, 16 suicides were documented in 2017 and six suicides in 2018, where exposure to a disaster was perceived as a precipitating factor for suicide.

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Contact Information

Puerto Rico Violent Deaths Reporting System
prvdrs@estadisticas.pr

Instituto de Estadísticas de Puerto Rico
Calle Quisqueya #57, 2do piso, San Juan, PR 00917
P.O. Box 195484, San Juan, PR 00919-5484
Tel. (787) 819-0730



**Instituto de Estadísticas
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