



**Non-Natural Cause of Death Report
A Review of Guam Death Certificates from 2012-2021**

OFFICE OF EPIDEMIOLOGY AND RESEARCH

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Preface

The 2020 U.S. Census has established the Territory of Guam's population at 153,836 people. The majority of the population are Pacific Islanders and Asians including indigenous Chamorros and other Micronesians (48.6%), Filipinos and other Asians (37.5%) with another 10.1% multiple ethnic groups. Assessing health disparities and the social determinants of health and socio-economic status is an important aspect of public health: compared to the U.S., Guam has a younger population, more foreign-born persons, more people using English as a second language, higher unemployment, lower educational attainment, higher average household size, lower median household income, and higher proportions below the poverty line.

This project was undertaken to examine non-natural death mortality (e.g. injuries, suicide, motor vehicle accidents, drownings and so on) in the U.S. Territory of Guam overall, and in detail by age and sex. Ethnicity was only examined for suicide.

The Guam DPHSS has no injury prevention program, however, this report, in conjunction with other reports and information, can inform prevention strategies on the three most common non-natural causes of death on Guam (suicide, motor vehicle accidents, and drowning).

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Introduction:

This report presents an analysis of the non-natural causes of death on the island of Guam. This report draws on a death certificate database provided by the Guam Office of Vital Statistics (OVS). Non-natural causes of death include homicide, suicide, overdose, and accidental injury among many others. Non-natural causes of death on Guam are a part of public health that are not often investigated, since Guam does not have an injury prevention program.

Methodology:

In order to determine the causes of death a review of the OVS death certificate database was conducted. This is a digitized version of the official Guam death certificate and includes information such as: detailed cause of death, contributing factors, home village or country, occupation, age, race, educational status, and sex. The year 2012 was chosen as the starting year because it was the first year in which complete digital information was available for review and the year 2021 represents the final year of complete information at the time of writing. Data are available for 2022 only for the Top ten Causes of Death.

Grouping of the causes of death into categories was necessary in order to ensure that all non-natural causes of death were accounted for. During this process the detailed description present of the death certificates was reviewed and grouped into one of several common categories. For example, if a death certificate read under cause of death “fractured skull” and under the descriptive section read “subject tripped and fell” then the cause of death would be grouped into the category “fall”. If a cause of death was not common or did not obviously fall under any existing category then a new category was formed, as was the case with “accidental crushing injury”.

Once these groups of categories were determined, the number of deaths in each category was counted and arranged based on prevalence by year, ranking with in the top

10 causes of death on Guam, and ranking by prevalence within an age group. This methodology was adapted from “Injury – A Major Public Health Problem in Hawaii”.¹

The two most common non-natural causes of death on Guam (suicide, motor vehicle accidents) were then examined to determine trends over the time frame observed.

Results:

The rankings of individual causes of death over the time frame examined remained relatively constant, with the number one spot being occupied by suicide for every year in which data was reviewed. The other top 6 include motor vehicle accidents which was at the number 2 spot for every year except 2015, followed by drowning, homicide, and accidental falls.

Figure 1 (Ranking Non-natural Causes of Death):

Rank	Year 2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	SUICIDE [27]	SUICIDE [27]	SUICIDE [28]	SUICIDE [35]	SUICIDE [50]	SUICIDE [36]	SUICIDE [45]	SUICIDE [32]	SUICIDE [39]	SUICIDE [26]
2	MOTOR VEHICLE ACCIDENTS [14]	MOTOR VEHICLE ACCIDENTS [18]	MOTOR VEHICLE ACCIDENTS [18]	DROWNING [14]	MOTOR VEHICLE ACCIDENTS [12]	MOTOR VEHICLE ACCIDENTS [19]	MOTOR VEHICLE ACCIDENTS [25]	MOTOR VEHICLE ACCIDENTS [17]	MOTOR VEHICLE ACCIDENTS [14]	MOTOR VEHICLE ACCIDENTS [18]
3	DROWNING [7]	DROWNING [15]	DROWNING [18]	MOTOR VEHICLE ACCIDENTS [10]	DROWNING [7]	DROWNING [14]	DROWNING [6]	DROWNING [11]	ACCIDENTAL DRUG TOXICITY [14]	HOMICIDE [10]
4	ACCIDENTAL FALLS [6]	HOMICIDE [10]	HOMICIDE [9]	ACCIDENTAL FALLS [9]	ASPHYXIA (SMOKE INHALATION) [6]	HOMICIDE [8]	HOMICIDE [6]	HOMICIDE [7]	DROWNING [10]	DROWNING [6]
5	HOMICIDE [3]	ACCIDENTAL DRUG TOXICITY [2]	ACCIDENTAL FALLS [4]	HOMICIDE [7]	HOMICIDE [3]	ASPHYXIA (BUTANE) [2]	ACCIDENTAL FALLS [3]	ACCIDENTAL FALLS [3]	HOMICIDE [7]	ACCIDENTAL FALLS [5]
6	ACCIDENTAL DRUG TOXICITY [2]	ACCIDENTAL FALLS [2]	ACCIDENTAL CRUSHING INJURY [1]	BLUNT FORCE TRAUMA [3]	ACCIDENTAL FALLS [2]	ACCIDENTAL FALLS [2]	ACCIDENTAL ELECTROCUTION [1]	ACCIDENTAL ELECTROCUTION [1]	ACCIDENTAL FALLS [4]	ACCIDENTAL DRUG TOXICITY [4]

The number in brackets represents [deaths] attributable to that category

The top 10 causes death on Guam can be seen in Figure 2. The chart groups together all accidental deaths (e.g drowning and vehicle accidents) to create the category

¹ Hawaii State Department of Health (2020). Overview-Leading causes of Injury in Hawaii, 2015-2019. Injury: A Major Public Health Problem in Hawaii. Available at: https://health.hawaii.gov/injuryprevention/files/2020/11/Injury-Data-Overview_15_19a-3.pdf

“accidents”. As can be seen in Figure 2 accidents and suicide are present in the middle-to-end of the top 10 every year most often occupying spots 5 through 8.

Figure 2 (Top 10 causes of death on Guam (2012-2022)):

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
1	Diseases of the Heart	Diseases of the Heart	Diseases of the Heart	Cardiovascular Diseases	Cardiovascular Diseases	Diseases of the Heart	Diseases of the Heart	Diseases of the Heart	Diseases of the Heart	Diseases of the Heart	Diseases of the Heart
2	Malignant neoplasms	Malignant neoplasms	Malignant neoplasms	Malignant neoplasms	Malignant neoplasms	Malignant neoplasms	Malignant neoplasms	Malignant neoplasms	Malignant neoplasms	Malignant neoplasms	Malignant neoplasms
3	Cerebrovascular disease	Cerebrovascular disease	Cerebrovascular disease	Cerebrovascular disease	Pulmonary Diseases	Cerebrovascular disease	Cerebrovascular disease	Cerebrovascular disease	COVID-19	COVID-19	Cerebrovascular disease
4	Diabetes mellitus	Accidents	Accidents	Diseases of the Respiratory System	Cerebrovascular disease	Septicemia	Diabetes mellitus	Septicemia	Cerebrovascular disease	Cerebrovascular disease	COVID-19
5	Septicemia	Diabetes mellitus	Septicemia	Diabetes mellitus	Septicemia	Accidents	Suicide	Accidents	Accidents	Nephritis, nephrotic syndrome, and nephrosis	Nephritis, nephrotic syndrome, and nephrosis
6	Chronic lower respiratory diseases	Chronic lower respiratory diseases	Diabetes mellitus	Septicemia	Renal Diseases	Suicide	Accidents	Nephritis, nephrotic syndrome and nephrosis	Nephritis, nephrotic syndrome, and nephrosis	Septicemia	Septicemia
7	Suicide	Suicide	Influenza and pneumonia	Hypertensive Disease	Suicide	Diabetes mellitus	Septicemia	Suicide	Septicemia	Accidents	Accidents
8	Certain conditions originating in the perinatal period	Septicemia	Suicide	Suicide	Accidents	Chronic liver disease and cirrhosis	Nephritis, nephrotic syndrome, and nephrosis	Influenza and Pneumonia	Suicide	Suicide	Suicide
9	Diseases of the Liver	Chronic liver disease and cirrhosis	Chronic lower respiratory diseases	Accidents	Liver Diseases	Nephritis, nephrotic syndrome, and nephrosis	Chronic lower respiratory diseases	Chronic liver diseases and cirrhosis	Influenza and pneumonia	Conditions of the Perinatal eriod	Chronic lower respiratory diseases
10	Accidents	Nephritis, nephrotic syndrome, and nephrosis	Nephritis, nephrotic syndrome, and nephrosis	Conditions of the Perinatal eriod	Infant Prematurity	Influenza and pneumonia	Influenza and pneumonia	Diabetes Mellitus	Chronic liver diseases and cirrhosis	Influenza and pneumonia	Influenza and pneumonia

Figure 3 shows non-natural causes of death separated by age groups. There are several trends that can be identified from this figure. Drowning represents the most common non-natural cause of death in the youngest group before falling to third on all older groups. Suicide is a relatively uncommon cause of death in the youngest group before becoming the most prolific from ages 15 to 64, and dropping lower again for the 65+ age group. Overdose deaths are not seen in either the youngest or oldest age groups, but represent the fifth most common non-natural cause of death in the 15 to 24 and 25 to 64 year old age groups. Falling as a cause of death is highest among the oldest age group. Other causes of death remain relatively stable across age groups with homicide and motor vehicle accidents remaining stable.

Figure 3 (Top Non-natural Causes of Death by Age):

	0-14	15-24	25-64	65+
1	Drowning [8]	Suicide [93]	Suicide [237]	MVA [20]
2	MVA [7]	MVA [39]	MVA [99]	Fall [20]
3	Accidental Hanging [5]	Drowning [22]	Drowning [66]	Drowning [12]
4	Homicide [5]	Homicide [9]	Homicide [53]	Suicide [11]
5	Suicide [4]	Overdose [3]	Overdose [22]	Homicide [3]
6	House Fire [4]	Fall [2]	Fall [19]	House Fire [1]
7	Fall [1]	House Fire [1]	Electrocution [4]	Work Accident [1]
8	Suffocation [1]	Diving Accident [1]	Diving Accident [3]	--
9	--	Suffocation [1]	Crush [3]	--
10	--	Accidental Hanging [1]	House Fire [2]	--

Specific non-Natural Causes of Death:

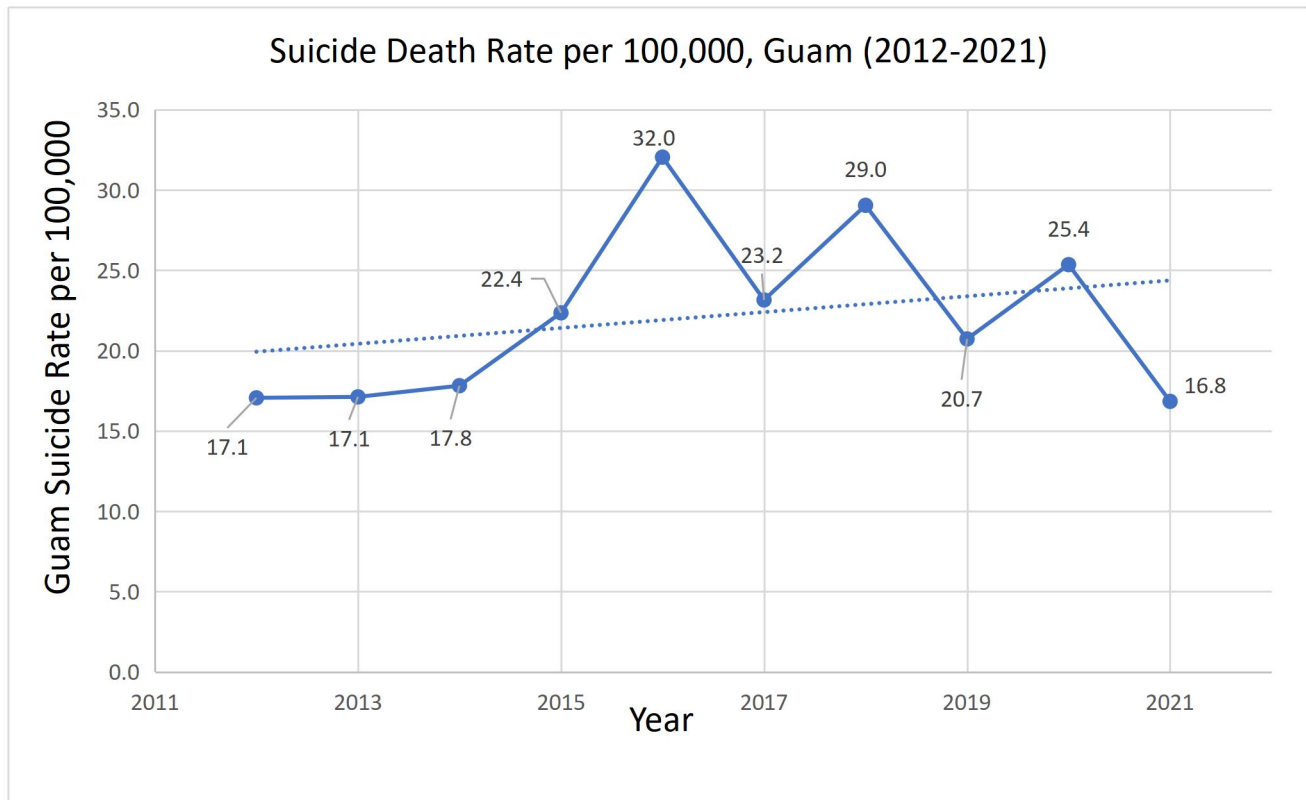
Suicide:

Guam’s suicide rate is significantly higher than the US and mainly affects people aged 10-49.² The issue of suicide on Guam is not new, but it is also not well understood. Some hypotheses put forward include Guam’s rapid modernization, as well as a social contagion theory.³ Based on Graph 1, Guam’s suicide rate per 100,000 from 2012-2021 shows a fluctuating pattern with the overall trend as an increase during this time period. As noted earlier, suicide is also the largest contributor to non-natural death on Guam by a large margin.

² “Suicide in Guam, 2021” Guam State Epidemiological Outcomes Workgroup (SEOW). <https://gbhwc.guam.gov/sites/default/files/Suicide%20in%20Guam%2C%202021.pdf> Retrieved 2023.

³ “Suicide on Guam: Putting It in Historical Perspective” Francis X. Hezel. <https://micsem.org/article/suicide-on-guam-putting-it-in-historical-perspective/> Retrieved 2023.

Graph 1:



	n	%	Average age
Chamorro or Chamorro listed first	125	49.2	33.1
Micronesian or Micronesian listed first	86	33.9	27.9
Filipino or Filipino listed first	20	7.9	36.9
All Other ethnicities combined	23	9.1	33.2
Total Suicides	254	100.0	

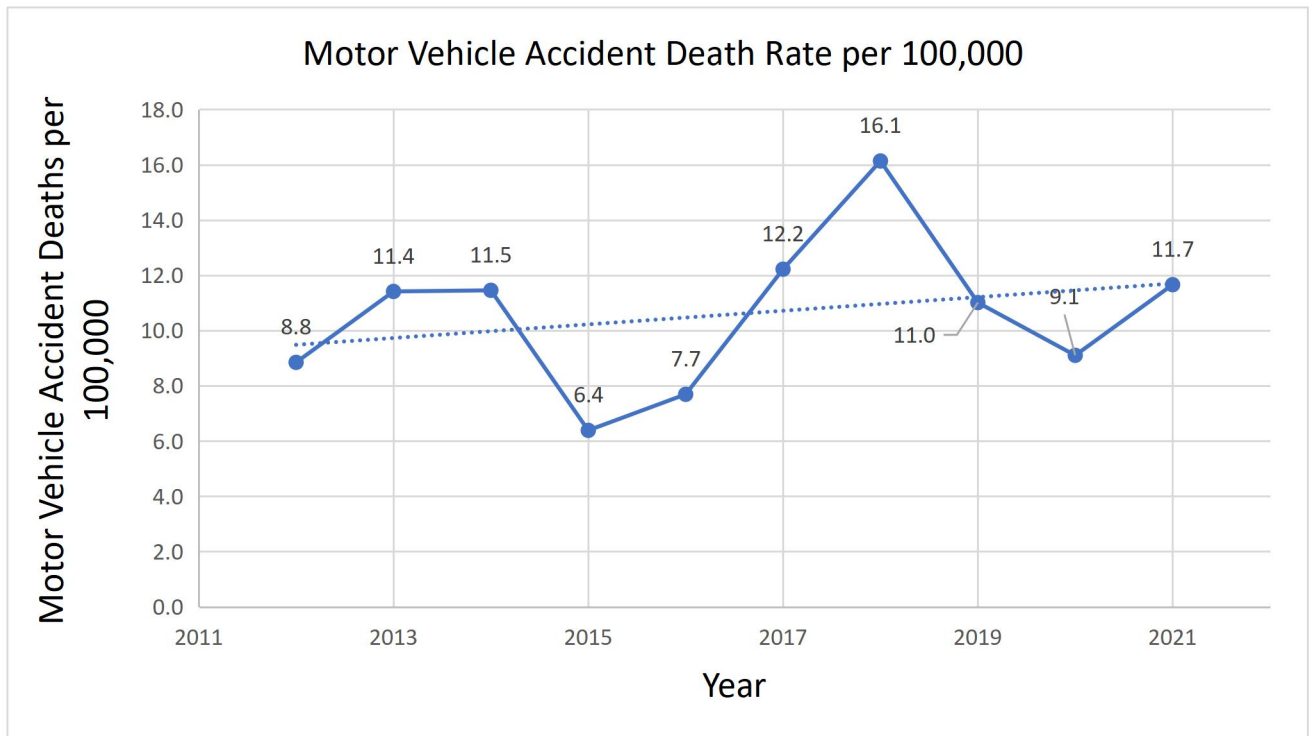
Table 1 shows that one-half of the suicides on Guam from 2012-2021 are among indigenous Chamorros, with Micronesians at one-third. Micronesians also have a younger age at suicide.

Motor Vehicle Accidents:

Motor vehicle accidents represent the next largest contributor to non-natural death and together with suicide represent the vast majority of non-natural causes of death on Guam. Like suicide, the motor vehicle death rate per 100,000 shows a fluctuating pattern with the overall trend as an increase from 2012-2021. When further examining the death

certificates attributed to motor vehicle accidents it was found that in 64.2% of decedents were occupants of a vehicle, while 35.8% were pedestrians.

Graph 2:



Conclusion:

Non-natural causes such as motor vehicle accidents and drownings are largely preventable. Other non-natural causes of death, especially suicide deserve further examination into their causes, especially among Chamorros and Other Micronesians on Guam. Additionally, the role of tourism and its potential implications on non-natural death occurrences should be studied (e.g. drownings).

Finally, evaluation of existing preventive measures and public health initiatives should occur. The fact that the rates for preventable deaths such as suicide and motor vehicle accidents are increasing serves as a reminder that more needs to be done to effectively address non-natural deaths on Guam. This surveillance project identifies a range of non-natural causes, accidents, suicides, homicides, and drug-related incidents. Factors such as the lack of regular surveillance on this topic, access to firearms, substance abuse, and mental health disparities could possibly contribute to trends in non-natural death.