



Health Analytics and Vital Records

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Alaska Facts and Figures

1964 Earthquake Mortality in Alaska

Background

The earthquake that occurred on March 27, 1964 was the largest in US history (magnitude 9.2 on the Richter scale) and the second largest ever recorded in the world.¹ Historical reports show that 115 people in Alaska died and an estimated 40-50 hospitalizations occurred for severe injuries.² Reporting agencies were quick to respond at the time. The registrar from what was then known as the Alaska Bureau of Vital Statistics, notified affected towns and gave instructions for hearings to establish presumptive death for persons that were not recovered. The Regional Emergency Health Service confirmed reports of fatalities and monitored for unofficial reports.² In commemoration of the 55 year anniversary of this devastating event, Alaska Vital Statistics historical records were evaluated for this time period.

Methods

Cause of death recorded on Alaska death certificates from March 27, 1964 through May 31, 1964 was entered into the Alaska Electronic Vital Records System (EVRS) to ensure that all earthquake related deaths were captured. For all deaths from Mar 27, 1964 to May 31, 1964, literal text for cause of death, both underlying and contributory, was examined for words including “earthquake” and “tidal wave”, as well as variations in spelling of these terms. Sex, age, and race of the decedent and the location of death classified by Census Area/Borough were also examined. Population estimates were provided by the Department of Labor and Workforce Development (DOLWD), Research & Analysis Section.³ Because the earthquake occurred in March 1964, an average of the estimates for July 1963 and July 1964 was used as the denominator for calculating rates. Note that some rates are based on very small numbers of events. The 1960s era population counts were available by election district; the corresponding current census area/borough or census subarea was determined after consultation with DOLWD Research & Analysis staff. For statewide age-adjusted (AA) rates of death, the proportion of population by age group from the 1960 census counts were applied to the 1963/1964 average total population to estimate population counts by age group and adjust to the 2000 US Standard population. Projected impact for an event like the 1964 earthquake was ascertained using statewide AA rates of 1964 earthquake related deaths, applied to the 2018 Alaska population in the geographical areas that were affected by the earthquake.

Results

Overview

- There were 1,440 deaths from all causes in 1964.
 - 115 (7.8%) of total deaths in 1964 were due to the earthquake.
 - 100 of the 115 earthquake related death certificates mentioned tidal wave, drowning, or boating in the underlying cause of death text.
- More males (75%) than females (25%) died during or due to the 1964 earthquake (Table 1).
- The largest proportion of earthquake related deaths were in persons aged 25 to 34 years (18.2%), followed by those aged 0 to 4 years (16.5%; Table 1). The percent of deaths in persons older than 55 years (13.0%) was much greater than the proportion of this age group in the general population (6.4%, 1960 estimate).⁴
- 67% of deaths were white individuals, while 32% were Alaska Native people. One death had unknown race (Table 1).

Table 1. Earthquake Related Deaths by Sex, Age, and Race, 1964

Characteristics	Deaths	
	Count	Percent
Sex		
Male	86	74.8
Female	29	25.2
Age		
0 to 4 years	19	16.5
5 to 14 years	15	13.0
15 to 24 years	6	5.2
25 to 34 years	21	18.2
35 to 44 years	15	13.0
45 to 54 years	18	15.7
55+ years	15	13.0
Missing	6	5.2
Race		
White	77	67.0
Alaska Native	37	32.2
Missing	1	<1%
Total	115	100.0

Location and Timeframe

- 111 of the 118 deaths that occurred on Mar 27, 1964 were earthquake related.
 - The remaining 7 deaths on Mar 27 were unrelated.
 - The other 4 earthquake related deaths occurred in the week following the earthquake.
- Two-thirds (74) of earthquake related deaths occurred in the Valdez-Cordova Census Area; the Kodiak Island Borough had the second largest number at 19 deaths (Table 2).
 - Chenega in the Valdez-Cordova Census Area was hit the hardest with 23 deaths of 83 living in the village.²

Table 2. Earthquake Related Deaths by Location of Death, 1964

Census Area/Borough	Deaths		Rate
	Count	Percent	AA
Municipality of Anchorage	9	7.8	
Kenai Peninsula Borough	13	11.3	
Seward-Hope Subarea	12		
Kenai-Cook Inlet Subarea	1		
Kodiak Island Borough	19	16.5	
Valdez-Cordova Census Area	74	64.4	
Statewide Total	115	100	158.9

Past and Present Impact

- The age adjusted earthquake related death rate for the areas affected by the earthquake^a in 1964 was 158.9 deaths per 100,000 population. The corresponding crude rate was 97.2 per 100,000 population. †
- AA rates applied to the 2018 population would represent 598 earthquake-related deaths in the areas affected by this event.^{a,†}

Discussion

Estimates of the number of deaths resulting from the 1964 earthquake reported in other studies are very close to the estimates we found in the Alaska Vital Statistics historical death records. Most deaths (64%) occurred in the Valdez-Cordova Census Area that was affected by the tidal wave, and of those, 28 deaths were adults and children watching the steamship Chena unload supplies, and 2 were working on the steamship.² Our estimate using historical vital records were incredibly close in comparison to estimates from a comprehensive report of the earthquake published in 1970.² The total number of earthquake related deaths (n=115) was the same, but locations of death differ. The hard copy death certificates were then re-examined and it was noted that location of death for some small towns or villages had been reported as occurring in the larger neighboring areas (i.e. Chenega noted as Valdez). The updated counts from vital records were used in this report. Demographic distribution of deaths were very similar to that reported in *The Great Alaska Earthquake*². While Alaska vital records are limited to deaths that happened in the state, other historical records report that 4 people were killed in Oregon and 11 in Crescent City, CA due to tidal waves following the earthquake.²

The loss of life due to this earthquake was relatively small for an earthquake of this magnitude. Several factors contributed to this; the earthquake took place later in the day and on a holiday (Good Friday) so many people were not out at their usual daily activities, the population density was low in many affected areas and many buildings were constructed from wood.⁵

The largest proportion of deaths after the earthquake were due to tidal waves (or tsunamis). After the earthquake, the Palmer Observatory was established in 1967 to provide tsunami warnings and earthquake information for coastal Alaska. The Palmer Observatory was eventually transferred to the National Weather Service. Later its scope was expanded and is currently in operation as the National Tsunami Warning Center, including during the Nov 2018 earthquake.⁶

The 2018 projected death estimates do not take into consideration changes in population age distributions (except statewide estimates), other socio-economic factors, or changes implemented after the 1964 earthquake, such as improvements/changes in building codes, warning systems, and emergency response.^{2,7} Villages that were moved after the earthquake (Valdez, for example)² would not be affected in the same way today. The 2018 projected estimates were generated to provide context if an earthquake of this size were to occur today under circumstances similar to those in 1964.

Comparison to Nov 30, 2018 earthquake

The recent Nov 30, 2018 earthquake was reminiscent of the 1964 earthquake in Alaska, but different in several ways. The 2018 earthquake was lower in magnitude (7.1 vs 9.2 in 1964), smaller in area, and shaking did not last as long.⁸ There were no tidal waves resulting from the 2018 earthquake, which caused a majority of the deaths in 1964. However, there was considerable property and infrastructure damage in some areas.⁹

Due in part to some of the differences noted previously, there were no earthquake related deaths from the 2018 earthquake recorded to date. In terms of morbidity, on the day of the earthquake, emergency department (ED) volume increased in 2 of 5 hospitals in the earthquake affected area. In total, from Nov 30 to Dec 7, 2018 there were 361 earthquake associated ED visits, with the most common reason for seeking care being injury.¹⁰ There was only 1 hospitalization. Morbidity could not be

^a Current census area/boroughs: Anchorage Municipality, Valdez-Cordova Census Area, Seward-Hope and Kenai-Cook Inlet Census Subareas, and the Kodiak Island Borough.

[†] Data not shown

evaluated for the 1964 earthquake since reporting of hospital and ED use was not in place during that time. The automatic collection of emergency department data and mandatory collection of discharge data was established in 2014 in Alaska through the state's Syndromic Surveillance¹¹ and Health Facilities Discharge Reporting¹² programs.

Health and medical disaster response in Alaska has changed significantly since 1964, and this change was evident in the coordinated response to the November 2018 earthquake. As a result of partnerships with federal, tribal, state, and local organizations, there is now a comprehensive network of plans and services that are activated when disasters occur. Throughout the year, critical stakeholders work together to improve plans, engage in joint trainings, test processes, and maintain 24/7 capability to assess and respond to the health needs of Alaskans following disasters or major incidents. For more information on earthquake preparedness see: <https://ready.alaska.gov/Preparedness/Outreach/Egprep>.

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- ¹¹ Alaska Syndromic Surveillance System. http://dhss.alaska.gov/dph/Epi/id/Pages/synd_surv/default.aspx
- ¹² Alaska Health Facilities Data Reporting Program. <http://dhss.alaska.gov/dph/VitalStats/Pages/HFDR/default.aspx>