**DATA ANALYSIS AND INTERPRETATION ON SCHOOL SHOOTING DATABASE**

**Table 1: Number of School Shooters between 1970 and 2019**

|  |  |  |
| --- | --- | --- |
| 1998 | 26 | 2.095085 |
| 1999 | 22 | 1.772764 |
| 2000 | 24 | 1.933924 |
| 2001 | 22 | 1.772764 |
| 2002 | 18 | 1.450443 |
| 2003 | 30 | 2.417405 |
| 2004 | 33 | 2.659146 |
| 2005 | 43 | 3.464948 |
| 2006 | 55 | 4.43191 |
| 2007 | 41 | 3.303787 |
| 2008 | 32 | 2.578566 |
| 2009 | 30 | 2.417405 |
| 2010 | 13 | 1.047542 |
| 2011 | 12 | 0.966962 |
| 2012 | 17 | 1.369863 |
| 2013 | 33 | 2.659146 |
| 2014 | 41 | 3.303787 |
| 2015 | 29 | 2.336825 |
| 2016 | 41 | 3.303787 |
| 2017 | 39 | 3.142627 |
| 2018 | 83 | 6.688155 |
| 2019 | 12 | 0.966962 |
| Total | 1241 | 100 |

|  |  |  |
| --- | --- | --- |
| **Year** | **Frequency** | **Percent** |
| 1970 | 17 | 1.369863 |
| 1971 | 21 | 1.692184 |
| 1972 | 16 | 1.289283 |
| 1973 | 17 | 1.369863 |
| 1974 | 14 | 1.128122 |
| 1975 | 13 | 1.047542 |
| 1976 | 8 | 0.644641 |
| 1977 | 14 | 1.128122 |
| 1978 | 15 | 1.208703 |
| 1979 | 14 | 1.128122 |
| 1980 | 20 | 1.611604 |
| 1981 | 16 | 1.289283 |
| 1982 | 18 | 1.450443 |
| 1983 | 25 | 2.014504 |
| 1984 | 23 | 1.853344 |
| 1985 | 18 | 1.450443 |
| 1986 | 16 | 1.289283 |
| 1987 | 24 | 1.933924 |
| 1988 | 35 | 2.820306 |
| 1989 | 15 | 1.208703 |
| 1990 | 13 | 1.047542 |
| 1991 | 27 | 2.175665 |
| 1992 | 28 | 2.256245 |
| 1993 | 34 | 2.739726 |
| 1994 | 32 | 2.578566 |
| 1995 | 19 | 1.531023 |
| 1996 | 16 | 1.289283 |
| 1997 | 17 | 1.369863 |

**Fig 1: Line Chart showing total number of school shooter between 1970 and 2019**

**Table 2: Age Group of Shooters**

|  |  |  |
| --- | --- | --- |
|  | **Frequency** | **Percent** |
| <18 years | 626 | 46.2 |
| 18 - 35 years | 248 | 18.3 |
| 36 - 70 years | 82 | 6.05 |
| > 70 years | 1 | 0.07 |
| Unknown | 399 | 29.4 |

**Fig 2: Bar chart showing age range of school shooter**

**Table 3: Shooter Gender**

|  |  |  |  |
| --- | --- | --- | --- |
|  | | Frequency | Percent |
| Valid | Female | 58 | 4.3 |
| Male | 1160 | 85.5 |
| Multiple | 5 | 0.4 |
| Police Officer/SRO | 22 | 1.6 |
| Unknown | 111 | 8.2 |
| Total | 1356 | 100.0 |

**Fig 3: Bar chart showing gender of shooter**

**Table 4: Shooter's Affiliation with School**

|  |  |  |
| --- | --- | --- |
|  | **Frequency** | **Percent** |
| Former Student | 60 | 4.4 |
| Former Teacher | 2 | 0.1 |
| Intimate Relationship with Victim | 31 | 2.3 |
| Multiple Shooters | 19 | 1.4 |
| No Relation | 140 | 10.3 |
| Non-Student Using Athletic Facilities/Attending Game | 36 | 2.7 |
| Other Staff | 19 | 1.4 |
| Parent | 23 | 1.7 |
| Police Officer/SRO | 31 | 2.3 |
| Relative | 16 | 1.2 |
| Student | 699 | 51.5 |
| Students from Rival School | 10 | 0.7 |
| Teacher | 17 | 1.3 |
| Unknown | 252 | 18.6 |
| Visiting Student | 1 | 0.1 |

**Fig 4: Bar Chart showing Shooter's Affiliation with School**

**Table 5: Shooter was Bullied**

|  |  |  |
| --- | --- | --- |
|  | Frequency | Percent |
| No | 1060 | 78.2 |
| N/A | 13 | 1.0 |
| Officer Involved | 21 | 1.5 |
| Unknown | 194 | 14.3 |
| Yes | 68 | 5.0 |

**Fig 5: Shooter was Bullied**

**Table 6: Shooter Targeted Specific Victim(s)**

|  |  |  |
| --- | --- | --- |
|  | Frequency | Percent |
| No | 319 | 23.5 |
| N/A | 16 | 1.2 |
| Officer Involved | 2 | 0.1 |
| Unknown | 133 | 9.8 |
| Yes | 886 | 65.3 |

**Fig 6: Shooter Targeted Specific Victim(s)**

**Table 7: Shooter's actions immediately after shots fired**

|  |  |  |
| --- | --- | --- |
|  | Frequency | Percent |
| Barricaded | 23 | 1.7 |
| Fled | 787 | 58.0 |
| Immediately Surrendered | 138 | 10.2 |
| Officer Involved | 21 | 1.5 |
| Subdued/Apprehended | 103 | 7.6 |
| Suicide/Attempted | 180 | 13.3 |
| Unknown if Subdued Surrendered or Fled | 104 | 7.7 |

**Fig 7: Shooter's actions immediately after shots fired**

**Table 8: Firearm Type**

|  |  |  |
| --- | --- | --- |
|  | Frequency | Percent |
| Combination of Different Types of Weapons | 34 | 2.5 |
| Handgun | 911 | 67.2 |
| Multiple Handguns | 16 | 1.2 |
| Multiple Rifles | 1 | 0.1 |
| Other | 37 | 2.7 |
| Rifle | 75 | 5.5 |
| Shotgun | 48 | 3.5 |
| Unknown | 234 | 17.3 |

**Fig 8: Firearm Type**

**Table 9: Descriptive Statistics (Number of Shot Fired)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **N** | **Minimum** | **Maximum** | **Mean** | **Skewness** | |
| **Statistic** | **Statistic** | **Statistic** | **Statistic** | **Statistic** | **Std. Error** |
| VAR00026 | 825 | 0 | 188 | 2.88 | 13.890 | .085 |

**Table 10: Location of the Incident**

|  |  |  |
| --- | --- | --- |
|  | Frequency | Percent |
| Inside School Building | 597 | 44.0 |
| Off School Property | 12 | 0.9 |
| Outside on School Property | 692 | 51.0 |
| School Bus | 40 | 2.9 |
| Unknown | 15 | 1.1 |

**Fig 10: Location of the Incident**

**Table 11: Causes of Incident of Shooting**

|  |  |  |
| --- | --- | --- |
|  | **Frequency** | **Percent** |
| Accidental | 151 | 11.1 |
| Anger Over Grade/Suspension/Discipline | 40 | 2.9 |
| Bullying | 34 | 2.5 |
| Domestic w/ Targeted Victim | 65 | 4.8 |
| Escalation of Dispute | 365 | 26.9 |
| Gang-related | 164 | 12.1 |
| Hostage Standoff | 30 | 2.2 |
| Illegal Drug Related | 15 | 1.1 |
| Indiscriminate Shooting | 55 | 4.1 |
| Intentional Property Damage | 17 | 1.3 |
| Mental Health | 32 | 2.4 |
| Murder | 8 | 0.6 |
| Murder/Suicide | 27 | 2.0 |
| Officer Involved Shooting | 22 | 1.6 |
| Racial | 15 | 1.1 |
| Robbery | 40 | 2.9 |
| Self Defense | 4 | 0.3 |
| Suicide/Attempted | 122 | 9.0 |
| Unknown | 150 | 11.1 |

**Fig 11: Bar Chart Showing Causes of Incident of Shooting**

**Table 12: Total injured/Killed Victims**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Total** |  | 1998 | 28 |
| 1970 | 19 | 1999 | 22 |
| 1971 | 21 | 2000 | 28 |
| 1972 | 18 | 2001 | 25 |
| 1973 | 18 | 2002 | 19 |
| 1974 | 16 | 2003 | 31 |
| 1975 | 14 | 2004 | 35 |
| 1976 | 11 | 2005 | 47 |
| 1977 | 16 | 2006 | 59 |
| 1978 | 16 | 2007 | 43 |
| 1979 | 14 | 2008 | 35 |
| 1980 | 20 | 2009 | 31 |
| 1981 | 17 | 2010 | 15 |
| 1982 | 18 | 2011 | 13 |
| 1983 | 26 | 2012 | 18 |
| 1984 | 24 | 2013 | 33 |
| 1985 | 19 | 2014 | 43 |
| 1986 | 16 | 2015 | 34 |
| 1987 | 24 | 2016 | 45 |
| 1988 | 38 | 2017 | 44 |
| 1989 | 16 | 2018 | 97 |
| 1990 | 15 | 2019 | 15 |
| 1991 | 31 |  |  |
| 1992 | 30 |  |  |
| 1993 | 41 |  |  |
| 1994 | 38 |  |  |  |
| 1995 | 19 |  |  |
| 1996 | 21 |  |  |
| 1997 | 20 |  |  |

**Fig 12: Line Chart Showing Total Injured/Killed Victims**

**Table 13: Victim Affiliation with school**

|  |  |  |
| --- | --- | --- |
|  | Frequency | Percent |
| Bus Driver | 1 | 0.1 |
| Former School Employee | 1 | 0.1 |
| Former Student | 17 | 1.3 |
| Former Teacher | 1 | 0.1 |
| Intimate Relationship | 1 | 0.1 |
| Multiple Victims | 97 | 7.2 |
| No Relation | 106 | 7.8 |
| No Victims | 161 | 11.9 |
| Other Staff | 64 | 4.7 |
| Parent | 25 | 1.8 |
| Principal/Vice-Principal | 1 | 0.1 |
| Relative | 8 | 0.6 |
| School Resource Officer | 1 | 0.1 |
| Student | 736 | 54.3 |
| Teacher | 76 | 5.6 |
| Unknown | 54 | 4.0 |
| Visiting Student | 6 | 0.4 |

**Fig 13: Bar Chart showing Victim Affiliation with school**

**Table 14: Gender of Victim(s)**

|  |  |  |
| --- | --- | --- |
|  | Frequency | Percent |
| Both | 155 | 11.4 |
| Female | 159 | 11.7 |
| Male | 853 | 62.9 |
| No Victims | 167 | 12.3 |
| Unknown | 22 | 1.6 |

**Fig 14: Bar Chart showing Gender of Victim(s)**

**Table 14: Regression Analysis on Number of School Shooter between 1970 and 2019**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table 14.1: Model Summary**  **Model Summary** | | | | |
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1 | .535a | .287 | .272 | 11.23156 |
| a. Predictors: (Constant), Time | | | | |

**Table 14.2: ANOVA**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **ANOVAa** | | | | | | |
| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
| 1 | Regression | 2432.274 | 1 | 2432.274 | 19.281 | .000b |
| Residual | 6055.106 | 48 | 126.148 |  |  |
| Total | 8487.380 | 49 |  |  |  |
| a. Dependent Variable: Number of School Shooters | | | | | | |
| b. Predictors: (Constant), Time | | | | | | |

**Table 14.3: Coefficients**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Coefficientsa** | | | | | | |
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
| B | Std. Error | Beta |
| 1 | (Constant) | 12.496 | 3.225 |  | 3.875 | .000 |
| Time | .483 | .110 | .535 | 4.391 | .000 |
| a. Dependent Variable: Number of School Shooters | | | | | | |

**DISCUSSION OF RESULTS**

Table 1 present result for number of school shooters between 1970 and 2019. It was discovered that year 2018 has the highest number of shooters. Year 2018 recorded about 83 school shooters representing 7% of the total sample population of 1356.

Table 2 shows the age group of the shooters. About 46.2% of the shooters are in the age range less than 18 years. 18.3% of the shooters are between 18 – 35 years, 6.05% between 36 and 70 years while 0.07% of the shooters are over 70 years. This indicates that majority of the shooters are teenagers.

Table 3 also shows the gender of the shooters. About 4.3% of the shooters are female, 0.4% are of multiple gender, 1.6% are police officer/SRO, 8.2% are unknown while majority of the shooters are male representing about 85.5%. This implies that most of the school shooters recorded are male.

Questions were asked to determine whether the shooters are affiliated to school. Responses from table 4 above shows that majority of the shooters are affiliated to school and they are student representing 699 (51.5%) of the total population. Furthermore, 10% of the shooters have relation with affiliated school.

Results from table 5 above shows that 5% of the shooter where bullied, 14.3% unknown, 1.0% N/A, 1.5% office involved while majority of the shooter are never bullied representing 78.2%. This implies most of shooter shots targeted victims even without being bullied.

Having known the number of school shooters recorded between 1970 and 2019 as well as whether they are being bullied or not. A further analysis was done to determine if the shooter targeted the specific victim(s). Results from table 6 above indicate that about 886 representing 65.5% targeted their respective specific victims.

Furthermore, results from table 7 above shows some of the shooters actions immediately after shots fired. About 1.7% of the shooters were barricaded, higher percentage of the shooters representing 58% fled away after shot fired, 10.2% immediately surrendered, 1.5% office involved, 7.6% subdued/apprehended. However, 13.3% of the shooter also committed/attempted suicide.

Majority of the firearm type used were analyzed in table 8 above. About 2.5% of the shooters used a combination of different types of weapons, 1.2% multiple handguns, 0.1% multiple rifles, 2.7% other firearm, 5.5% rifle, 3.5% shotgun, 17.3% unknown while majority of the shooter used handgun representing 67.2%.

A descriptive statistics were carried to determine the average number of shot fired each year. Results from table 9 above shows that on average about 3 shots are fired each year and maximum number of shot fired recorded is 188 which happened in the year 1999.

Table 10 above shows that majority of the incident of school shooting happened outside on the school property representing about 51.0%. Likewise, about 44% of the shooting incident also happened inside the school building.

Table 11 presents some of the causes of the incident of shooting. Majority of shooting incident are caused by escalation of dispute representing 365 (26.9%). Likewise some of the major causes still include suicide/attempted representing 9%, gang – related 12.1% as well as some of accidental shooting incident representing 11.1%.

Table 12 present number of victim killed or injured between 1970 and 2019. Year 2018 have the highest number of victim killed or injured. About 97 victims were killed/injured in year 2018 alone which also correspond to the highest number of shooters recorded which was also in the year 2018.

Table 13 and 14 present the victim’s affiliation to school as well as the gender of the victim killed or injured. About 54.3% representing 736 victims are affiliated with school which implies that they are student. In addition, most victim killed or injured are male student representing 853 (62.9%) of the total population.

A simple linear regression analysis was also carried out to determine the trend of the number of shooters recorded between 1970 and 2019. The linear regression equation is given as *Number shooter = 12.496 + 0.483time.* The expected number of shooter will be 12 if time is not put into consideration. Likewise for every unit increase in time, there will be an increase of about 0.483 in the total number of shooters each year. The model is significant with sig value of 0.000 for both time and number of shooters. From the ANOVA table, The ANOVA Sig value is given as 0.000 which means that there is a significant linear relationship between time and number of shooters. The correlation value R = 0.535 implies that there is a positive relationship between time and number of shooters. Also, R- square value which is 0.287 means that about 28.7% variation in number of shooters can be explained by time while 71.3% can be explained by other factors.