



The Unrest Situation in The Southernmost Provinces of Thailand from 2004-2018

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Abstract The unrest situation in Thailand has been occurring in four provinces of Pattani, Yala, Narathiwat, and Songkhla since 2004. People are affected by the situation not only on their loss of property but also on their physical and mental health. The purposes of this study were to examine the injury-death rates of the victims and to investigate the effects of year, age, gender, and sub-district on the injury-death rates from the unrest situation during 2004-2018. The data were obtained from the Deep South Coordination Center, Prince of Songkla University, Pattani Campus. A log-linear regression model was used to examine the effect of the factors on injury-death rates. The results showed that the overall mean injury-death rate was 35.5 cases per 10,000 population. The rate peaked in the year 2007 and decreased until 2018 with the lowest rates of around 23.1 cases per 10,000 population. Males aged greater than 20 years were more likely to be injured and had higher death injury-death rates than the overall mean. Women aged greater than 60 years had higher injury-death rates than the overall mean. Most of the injury-death rates of sub-districts in Songkhla were lower than the overall mean. In contrast, most of the sub-districts of Pattani and Yala provinces had rates higher than the overall mean. Men were at a higher risk than women while those living in Pattani and Yala were more vulnerable than other provinces.

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1. INTRODUCTION

The unrest situation in the four deep south provinces of Thailand has been occurring since 2004. It has been affecting the daily lives of people in all communities. During 2004 to 2019, there were 20,485 incidents of violence involving 20,432 victims, and caused 7,000 deaths, 13,644 injuries, 3,075 widows, and 6,575 orphans [1]. The victims included military personnel, police officers, teachers, government staff, women and children. More than 360 schools and about 50 hospitals were attacked [2].

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The effects of the unrest in terms of area development, health, economics, tourism, and education have been severe and extensive. Agriculture, especially rubber tapping, is the main occupation of the people in the area. Since the unrest began, people have been concerned about traveling to work and even while working. In economics, the Office of The National Economic and Social Development Board (NESDB) reported that from 2007 to 2018 people in Pattani, Yala, and Narathiwat provinces were ranked in the top ten in terms of poverty each year compared to other provinces of Thailand [3]. In education, primary schools would close frequently and teachers are reluctant to work causing students to miss educational opportunities. The United Nations Development Programme (UNDP) reported that in Yala, Pattani, and Narathiwat provinces in the year 2011, had the lowest average score of the ordinary national educational test (o-net) [4]. The effects have also been visible on tourism and related businesses, not only in the three Deep South provinces, but also in nearby areas such as Hat Yai district in Songkhla province, where many tourists from Malaysia and Singapore frequent. Fewer tourist arrivals to Hat Yai were seen after 2004 compared to before the unrest [5]. The unrest situation has also affected the relationship between people of different religions - people no longer trust each other, unlike in the past where people of all religions were at peace with one another. The biggest impact from the unrest situation has been felt on the physical aspects, such as death, injuries, and disabilities. The number of orphans and widows in the area has also increased. However, throughout the 16 years, the government has spent more than 300,000 million baht and provided 30,800 million baht by 2020 for solving the problems in the area [6].

This study aimed to investigate trends of injury-death rates and to examine the association between relevant factors and the injury-death rates from 2004 to 2018 in the three Deep South provinces and four districts of Songkhla province, Thailand.

2. METHODOLOGY

2.1. DATA SOURCE AND DATA MANAGEMENT

The daily data of victims from the unrest in the southernmost provinces of Thailand during 2004 were obtained from the Deep South Coordination Center (DSCC), Prince of Songkla University, Pattani Campus. The outcome, injury-death rate, was defined as the frequency counts for each gender, age, and sub-district divided by the respective population and multiplied by 10,000. As the injury-death rates were not normally distributed, they were log transformed before model fitting.

The determinants were year and sub-district of unrest, age and gender of the victims. The years consisted of 15 years from 2004 to 2018. There were 284 sub-districts from Pattani, Yala, Narathiwat, and Songkhla provinces. The age was classified into 10 groups including 0-10 years, 11-20 years, 21-30 years, 31-40 years, 41-50 years, 51-60 years, 61-70 years, 71-80 years, and 81-90 years. The variables of age and gender were combined together to form 18 age-gender groups.

2.2. STATISTICAL ANALYSIS

Log-linear regression was used to examine the association between the determinants and the injury-death rates as follows.

$$\log(y) = \beta_0 + \sum_{i=1}^k \beta_i X_i + \varepsilon \tag{2.1}$$

where y is the injury-death rates, β_0 is intercept, and β_i are regression coefficients for the independent variables, X_i are independent variables, ε is the error term or residual, and k is the number of determinants.

The overall goodness-of-fit of the model was assessed using normal quantile-quantile plot and the R-squared. The 95% confidence interval of the estimated parameter was calculated using sum contrasts [7]. All graphical and statistical analysis was carried out using R.

3. RESULTS

The total number of injuries and deaths was 21,838 and the overall mean was 35.5/10,000 population. The frequency, percentage and rate classified by age group, gender, year, and sub-district from 2004 to 2018 are shown in Table 1.

TABLE 1. Frequency and percentage of injury and death victims

Variables	Frequency of injury+death	Percent	Average of injury+death rates (10,000 population)
Total	21,838	100	35.50
Age group (years)			
0-10	447	2.05	13.78
11-20	1,507	6.90	24.09
21-30	6,382	29.22	53.39
31-40	5,934	27.17	51.24
41-50	4,358	19.96	52.51
51-60	2,254	10.32	60.97
61-70	667	3.05	69.03
71-80	249	1.14	99.68
81-90	40	0.18	195.23
Gender			
Male	18,021	82.52	58.78
Female	3,817	17.48	31.02
Province			
Pattani	6,888	31.54	59.37
Yala	6,145	28.14	52.65
Narathiwat	8,184	37.48	46.72
Songkhla	621	2.84	35.83
Year			
2004	1,012	4.63	52.30
2005	1,607	7.36	51.76
2006	1,938	8.87	53.49
2007	3,598	16.48	69.09
2008	2,060	9.43	65.64

Variables	Frequency of injury+death	Percent	Average of injury+death rates (10,000 population)
Year			
2009	2,089	9.57	55.02
2010	1,557	7.13	48.81
2011	1,698	7.78	49.78
2012	1,560	7.14	46.06
2013	1,458	6.68	51.32
2014	1,052	4.82	39.28
2015	681	3.12	37.85
2016	881	4.03	37.88
2017	497	2.28	43.69
2018	150	0.69	31.73

The majority of cases were aged between 21 and 50 years. The rate for males (82.52%, 58.78 cases/10,000 population) was higher than for females. Narathiwat and Pattani had high percentages with 37.48 and 31.54, respectively but Pattani and Yala had higher number of cases than the others, 59.37 and 52.65 respectively. After the percentage of injury and death reached the peak in 2007, the percentages of injury-death rates decreased every year until 2018. However, the rates in 2007 and 2008 exceeded 60 cases/10,000 population and was above 30 cases/10,000 population until the year 2018.

Table 2 shows the results from the ANOVA and demonstrates that all determinants, year, sub-district, and age-gender were statistically significant at the 0.05 level.

TABLE 2. ANOVA table of log-linear regression

	Df	Sum Sq	Mean Sq	F value	P-value
Year	14	206.1	14.72	38.258	<0.0001
Sub-district	283	2,126.3	7.51	19.527	<0.0001
Age-gender	17	1,366.4	80.37	208.884	<0.0001
Residuals	8,458	3,254.5	0.39		

The 95% confidence intervals of the effects of year, age-gender, and sub-district into the injury and death rates from log-linear regression are shown in Figures 1-6. From the figures, the y-axes are the injury-death rates (cases/10,000 population) presenting in a log-scale. The horizontal red line is the overall mean which was 35.50 cases/10,000 population.

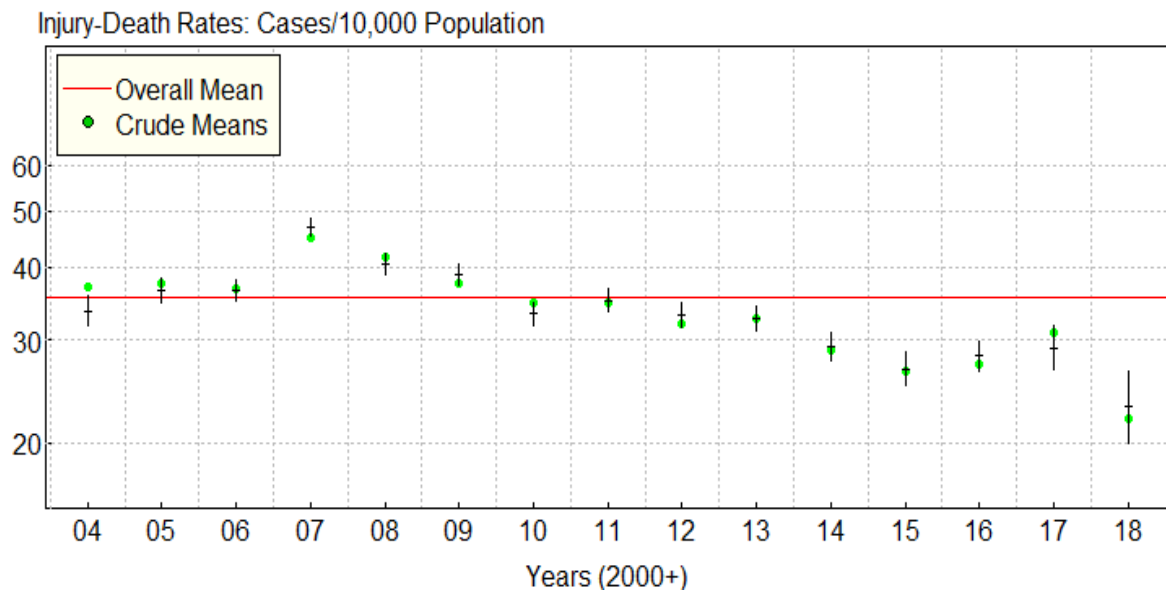


FIGURE 1. Mean and 95% confidence intervals of the injury-death rates for the effects of year

Figure 1 shows that the highest injury and death rates occurred in 2007 at around 46.92 cases per 10,000 population after which the rates declined. Although the rates increased slightly in 2011 (35.14 cases per 10,000 population) and in 2017 (29.07 cases per 10,000 population), the rates after 2011 remained below the overall mean. The injury-death rates in 2018 was 23.06 cases per 10,000 population falling from 2007 by 50.85% and falling from 2004 by 31.51%.

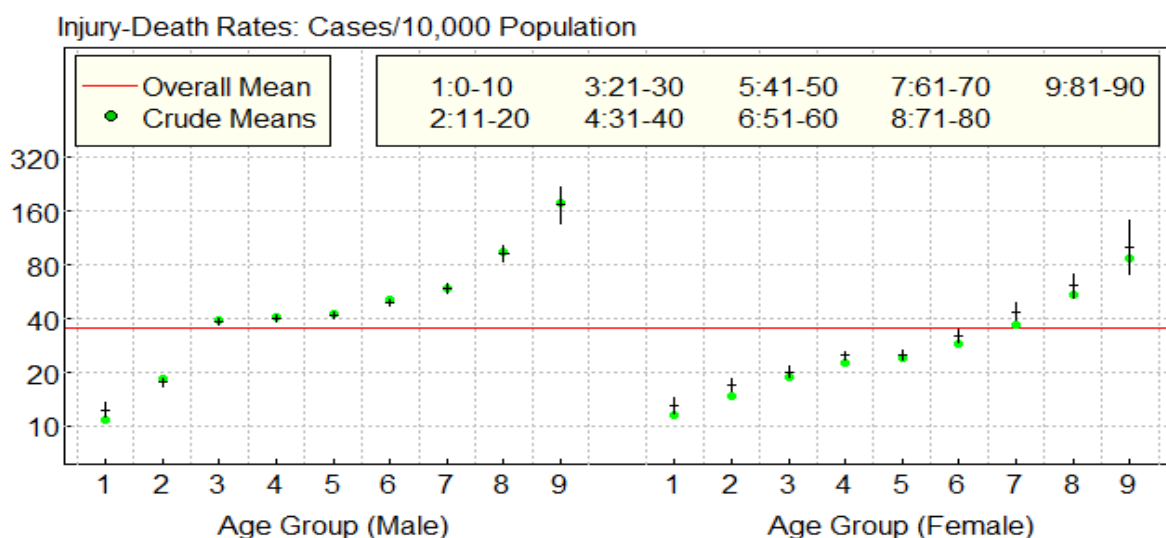


FIGURE 2. Mean and 95% confidence intervals of the injury-death rates for the effects of age-gender

Figure 2 shows that males aged more than 20 years had higher injury-death rates than the overall mean. Furthermore, there was a wide gap between age group 11-20 years and 21-30 years, which were 17.63 cases per 10,000 population, and 38.65 cases per 10,000

population respectively. Females aged more 60 years had higher rates than the overall mean. Overall, females aged between 21 and 60 years had lower rates than males of the same age. The rates among males of aged 21-30, 31-40, 41-50 and 51-60 years were 38.65, 40.21, 41.40, and 49.31 cases per 10,000 population, respectively.

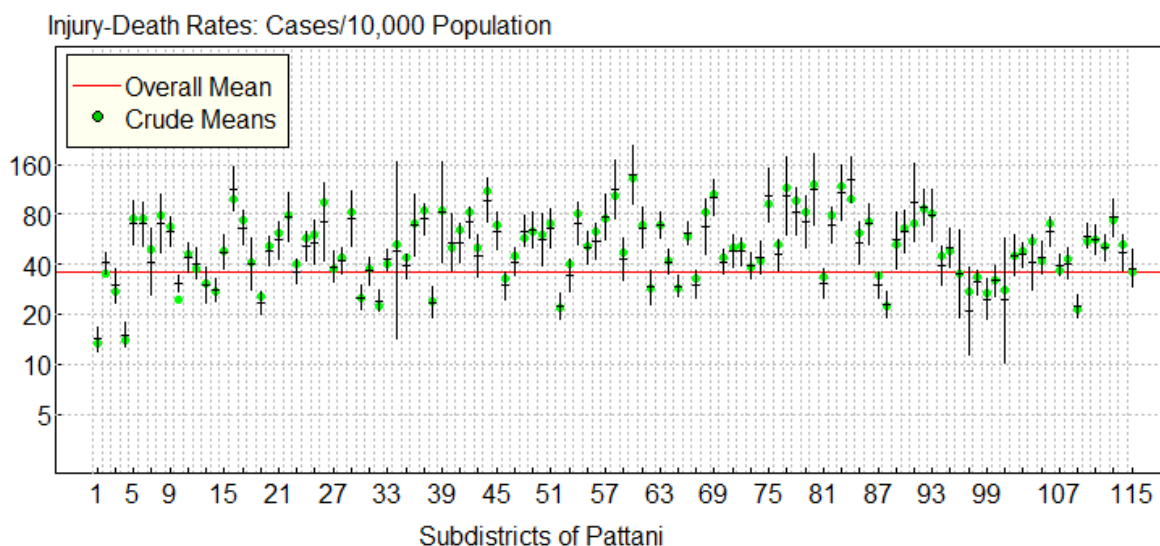


FIGURE 3. Mean and 95% confidence intervals of the injury-death rates for the effects of sub-district in Pattani

Figure 3 shows the injury-death rates for the 115 sub-districts of Pattani province. The rates of 65 sub-districts were higher than overall mean of which most were in the rural area. The lowest rate was 14.19 cases per 10,000 population and occurred in Sabarang sub-district, Mueang Pattani district and the highest rate was 137.35 cases per 10,000 population in the sub-district of Panan, Mayo district.

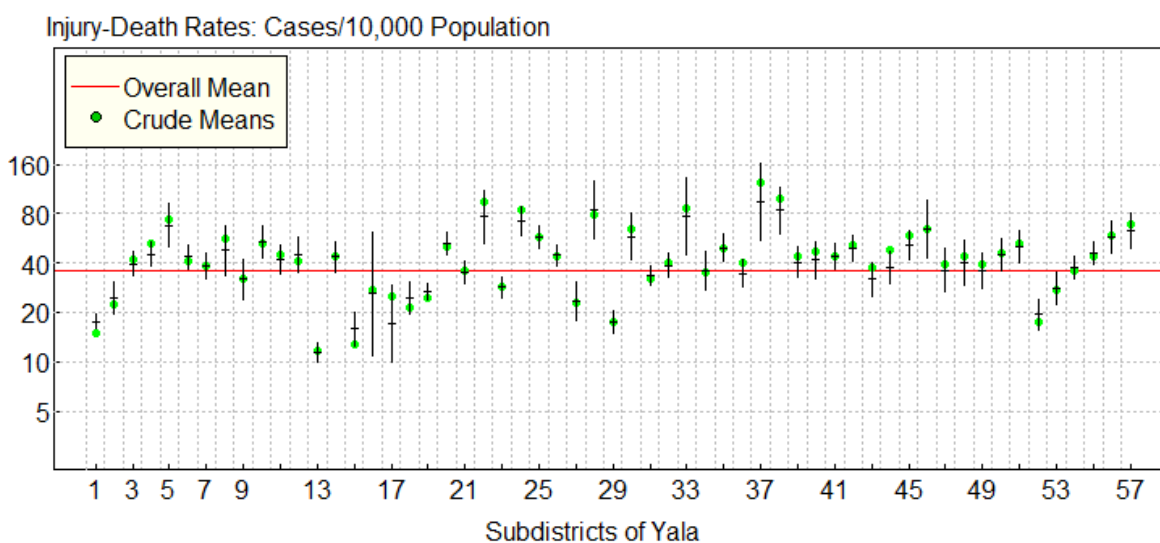


FIGURE 4. Mean and 95% confidence intervals of the injury-death rates for the effects of sub-district in Yala

There were 57 sub-districts in Yala as shown in Figure 4. The injury-death rates of 24 sub-districts were higher than overall mean that were in Raman, Yaha, Than To, Banang Sata, and Mueang districts. The injury-death rates of 12 sub-districts were lower than overall mean, and the injury-death rates of 21 sub-districts were around the overall mean. The minimum of the injury-death rates was 11.39 cases per 10,000 population in the sub-district of Sateng Nok, Mueang Yala district and the maximum of the rate was 94.24 cases per 10,000 population in the sub-district of Kalupang, Raman district.

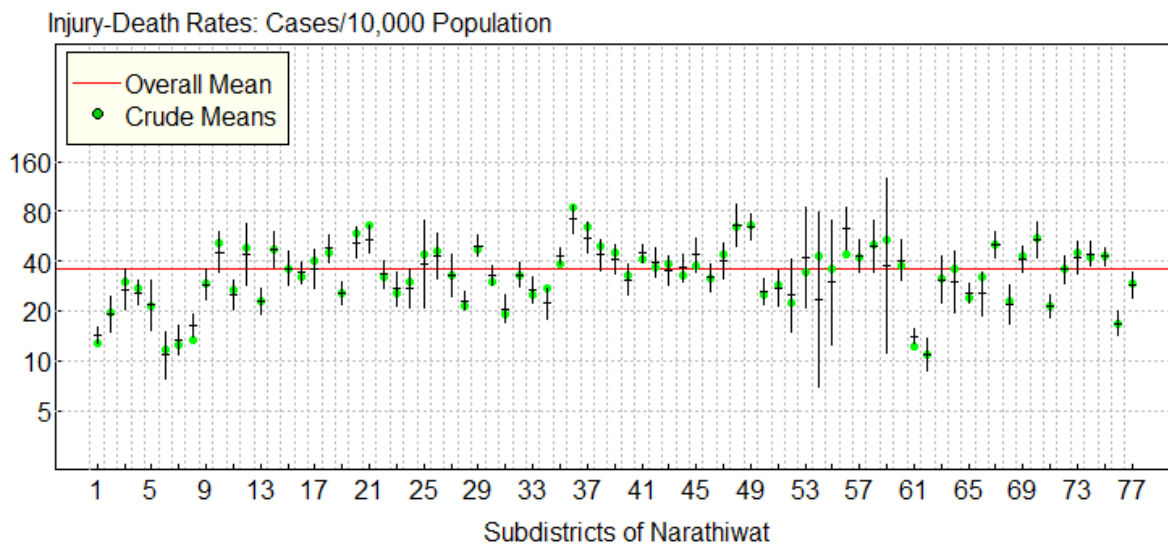


FIGURE 5. Mean and 95% confidence intervals of the injury-death rates for the effects of sub-district in Narathiwat

In Narathiwat, the 77 sub-districts were effected from the unrest situation as shown in Figure 5. The injury-death rates of 16 sub-districts were higher than overall mean. The injury-death rates of 25 sub-districts were lower than overall mean, and the injury-death rates of 36 sub-districts were around the overall mean. The minimum of the injury-death rates was 10.86 cases per 10,000 population in the sub-district of Kaluwo Nuea, Mueang Narathiwat district and the maximum of the rate was 71.51 cases per 10,000 population in the sub-district of Sawo, Rueso district.

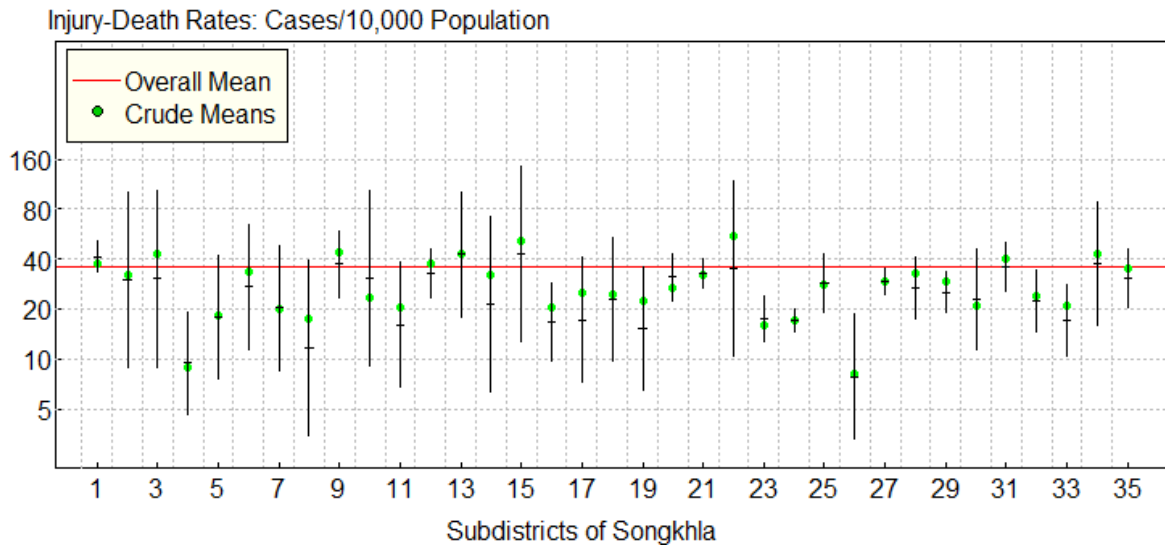


FIGURE 6. Mean and 95% confidence intervals of the injury-death rates for the effects of sub-district in Songkhla

There were 35 sub-districts in Songkhla as shown in Figure 6. The injury-death rates of 9 sub-districts were lower than overall mean. The injury-death rates of 26 sub-districts were around the overall mean. The minimum of the injury-death rates was 7.84 cases per 10,000 population in the sub-district of Sakom, Thepha district and the maximum of the rates was 42.75 cases per 10,000 population in the sub-district of Tha Pradu, Na Thawi district.

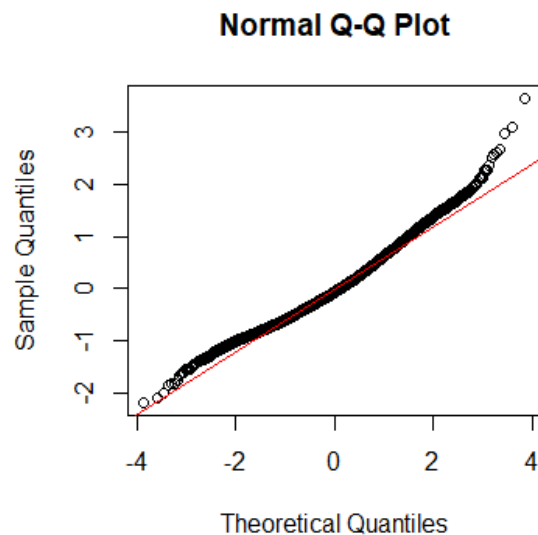


FIGURE 7. The graph of normal quantile-quantile plot of log-linear regression.

Figure 7 illustrates that the model of the injury-death rates conducted from log-linear regression was acceptable with the adjusted R-squared of 51.46%.

4. DISCUSSION AND CONCLUSION

The total number of cases of injuries and deaths from 2004 to 2018 in the current study was 21,838 and the overall mean rate was 35.50 cases/10,000 population. The injury-death rates declined during the study period falling around 50.85% compared to 2007 in line with the study of Pak Institute for Peace Studies (PIPS) [8] in Pakistan, which found that the fatalities fell by 46% from 2015 to 2016. A study from the United Nations Assistance Mission in Afghanistan (UNAMA) found that the number civilian casualties in Afghanistan increased in 2017 with 916 cases and 1,751 cases in 2018 [9]. However, this study was conducted during 15 years but the previous studies were conducted during 2 years.

Males aged more than 20 years had injury-death rates than the overall mean. The injury-death rates among males aged 21-30, 31-40, and 41-50 years were 38.65, 40.21, and 41.40 cases per 10,000 population, respectively. During 2004-2011, males were 2.32 times more likely to die than females [10] and during 2004-2016 the global violent death rate had a significant association between gender and being a victim [11].

The injury-death rates showed the higher rate mostly in the rural area than the urban area. However, the terrorist activities had spreading from terrorism in the border region to many parts of the country in Pakistan [8].

In addition, for the further study need to display the injury-death rates in each area using thematic map clearer figure.

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