A Comparative Analysis of Suicide, Economic Growth and Unemployment Rates: South Asian Context

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INTRODUCTION

Background of the study

Even in the giant economy holder, the "USA", for every 1% increase in unemployment 40,000 people dies. This is an unbelievable significant claim that adds even more weight to the already significant societal issues that come along with people out of the job. What makes this even more relevant is that today many governments around the world are making tough decisions between the health of their citizens and the economic prosperity of their nation. If this claim of 40,000 deaths per 1% unemployment is to be believed then these governments may very well be damned if they do, and damned if they don't. Therefore, is this claim actually true? Or is it just the work of Hollywood fiction trying to raise the stakes? How is it that these deaths are actually caused?

Further, are these statistics only true for one country, or does it happen more or less in countries with stronger social welfare?

Becoming unemployed either by getting fired or being made redundant is never a positive experience on an individual level. Getting fired means a person has to live with the idea that he/she were not good enough for the job and being made redundant means that they are often going out into an economic downturn with very little job opportunities. In either case it is going to be hard to find a new job to maintain their quality of life. However, is this all backed up by the numbers? Do 40,000 people actually die for every 1% increase in unemployment? Well, no, the actual number Brad Pitt should have quoted here is 37,000 (Crudele, 2020). Now, of course, this is being pedantic over what is basically a rounding error, but the actual study what he is most likely referring to is the 1981 publication, "Corporate Flight: The Causes and Consequences of Economic Dislocation". This was a book authored by Bennett Harrison and Barry Bluestone, two American economists who were actually writing about the impacts of outsourcing labour to cheaper manufacturing centres around the world. They noted that long term structural unemployment caused an early demise in a variety of ways. The main killer was heart disease, where unemployment was said to cause 20,000 deaths that

would not have otherwise happened due to increased stress, and limited access to healthcare that normally came with regular employment

Another major component was a spike in substance abuse, particularly drinking that people will turn to, to deal with the pressures of being unemployed. The others were issues like suicides and homicides that were also shown to have a strong correlation with unemployment. There was all of this plus a collection of smaller factors that all added up to the 37,000 death figure. Now this all sounds logical, any issue as stressful as unemployment, over a large enough sample size, will have some casualties, but 37,000 sounds pretty extreme. It also sounds like this study is in direct contradiction to a more recent study, titled Losing Life and Livelihood: A Systematic Review and Meta-Analysis of Unemployment and All-Cause Mortality, which sounds, just, thrilling. This is actually a medical study published by, the US national Library of Medicine, and authored by those other kinds of doctors, the type that can prescribe medication. Therefore, a big disclaimer here is that a lot of the Ins and outs of this paper are lost on regular economists, but the statistical figures are still relevant. If someone got fired, started stress eating and drinking while looking for a new job and then happened to die a few years later of liver failure, then that would count on the economic paper, but it may not count on the medical paper. What does this mean for?

Today's economy have recently experienced the largest spike in unemployment ever and the impacts of outsourcing, not the impact of an economic recession. If a factory is moved to overseas then it is not likely that those jobs are ever coming back.

Sri Lankan economy since the political independence in 1948 has experienced primary structure difference in various aspects in the country. Inflation, Economic Growth which is measured by Gross Domestic Product and Unemployment, are the important variables in any macroeconomic decision making and they are subject of social and economic life of every country. Sri Lanka is an island nation existing in the Indian Ocean, off the South-East coast of India. It has a population of 20.3 million, 77% of people lives in rural areas. Following a number of boundary changes, the country is composed of 25 districts.

Approximate generalization in the literature is that suicide rates direct to mainly rise in times of economic recession & during periods of social change. Since the early 1990's most deaths by suicide have been primarily amongst the economically indolent individuals thus implicit that the social costs of unemployment may be higher than previously thought and should therefore not be undermined or taken for accord by policymakers. In terms of business cycle trends, a number of academics have noticed that the correlation between suicide rates and unemployment is more notable during economic crisis.

Considerably, it is generally believed that the social costs linked with unemployment, such as lower income, lower levels of life satisfaction and higher levels of depression, which significantly contribute

to suicide or serious intentions to commit suicide, are aggravated during downturn periods caused by economic crisis.

Unemployment as an autonomic imperilment for troubled mind status, including depression, is common. Recently, there has been an increased interest in whether unemployment increases the risk of suicidal conduct, involve suicidal ideation. For an example, unemployment status has been found to be both a notable and peculiar risk factor for suicidal ideation for psychiatric outpatients. The suicidal ideation at baseline was connected with a collect of ill-fated life events, including unemployment. Besides, depressive mood seems to be a necessary mediating factor. Because of the effect of unemployment on mental health, research into the impact of unemployment on suicidal ideation is of great importance.

Further, in periods of economic expansion, many capitalist economies are characterized by business cycles with adjunctive increases in joblessness during recessions and depressions, and reductions in unemployment. In view of the potentially debilitating effects of joblessness on health and related outcomes, both epidemiology and sociology research on unemployment and suicide concerned in continues to be. The issue of selection bias is one of the controversies that continue. The vital question that remains unresolved is whether the observed combination between unemployment and suicide reported in some studies reflects direct causation or whether there is some other variable that is casually prior to both suicide & unemployment.

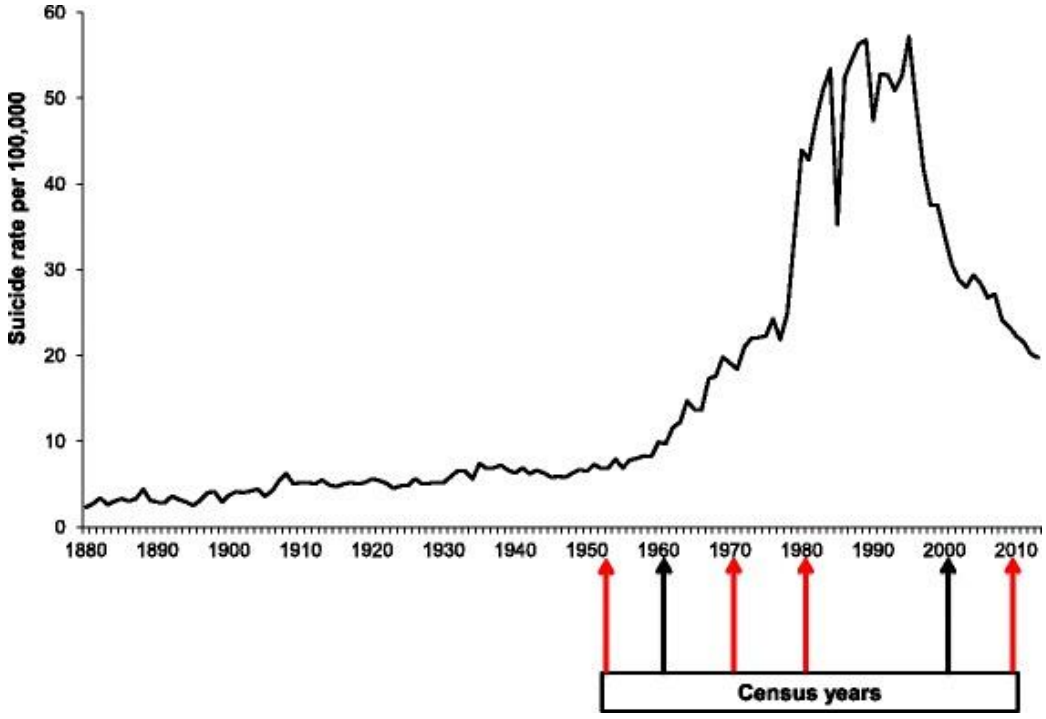
Compared to the employed people, Individuals outside the labour market had odds of suicidal ideation. There was a statistically significant relation between being out of work and suicidal ideation. The relation was explained partly by socio-economic, demographic, and self-reported psychological variables. Especially during times of economic hardship, the need for primary prevention strategies among those out of the labour market is a must.

Therefore, from this study, researcher discuses about the correlation between Suicide rate, Unemployment & Economic Growth. Further, the study focuses on the factors that impact on Suicide rate, Unemployment. Researcher focused on how age standardized Suicide rate and Unemployment & Economic Growth influenced in Sri Lanka & globally.

Problem Statement

According to the Journal of Asian Studies by (Kearney, 1987) the suicide rate in Sri Lanka is soaring from 6.9 to 22.1 per 100,000 populations triple between 1955 and 1974. Accurate increases were recorded for most age groups, sexes and all of the nation's twenty-two districts. The incidence of suicide was drastic in the age range of 15 to 29 years. It is suspected that the suicide rate was closely related to the National's economic status such as economic growth and unemployment rate, which is important to revisit and confirm.

Figure 1: National Suicide Rates per census Years Sri Lanka



Source: Duleeka W. Knipe, #. P. (2017). Regional variation in suicide rates in Sri Lanka between 1955 and 2011: a spatial and temporal analysis, 14.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5310090/

The national suicide rates over time, and census years. Years selected for analysis in this study are highlighted in *red*.

In an early study for Japan, (Hamermesh & Soss, 1974) found that the social capital increases people consolidation and has an excessive effect upon the suicide of females than that of males. It argues that it could be probably due to the fact that females are less likely to have full-time jobs and thus have more extra time, leading them to seek social involvement in their neighbourhoods and encouraging them to associate in community activities. Later (Yang B. , 1992) showed that the influence of labour force participation on suicide rate is sensitive to the gender and nation.

Further, it was found that unemployment and welfare are related to suicide (Lester, Stack, & Yang, 1992) and the roles of cyclical components are important in understanding the suicide (Oswald, 2012) analyses using long Finnish time series data for the period 1878-1994 the relationship between suicide rate and business cycles and put forward that suicide rate increases along with age and is related to both GDP growth (inversely), unemployment and bankruptcies.

Using cross-section study for 30 countries, (Jungeilges & Kirchgässner, 2002) showed that increase in real income per capita and real income growth increases the probability of the suicide rate. However,

it is sensitive to the gender and age group. While suicide rate of middle age group rising with increase in the role of real income per capita; where increased role of economic growth is elderly segment of population is significant. Besides, older women hold stronger to real income growth than older men.

The issue of suicidal deaths is under research in India. However, in last few years, the issue of the suicidal deaths has been taken renewed social and policy attention. However, some significant proportions of suicidal deaths exist unreported. In the recent years, particularly Andhra Pradesh, Karnataka, Kerala, Punjab and Maharashtra (Mishra & Koehler, 2006) there have been reported in a number of many cases of farmer's suicide.

Using a panel data with 22 Indian states for 5 time point during 1977-2001, (Mitra & Shroff, 2008) had found that relative freedom of women (measured by the male-female suicide ratio) is growing over time after controlling the effect of per capita income. In a study for elderly Indians, (Kumar & Shah, 2009) showed that income discrepancy (measured in terms of Gini coefficients) independently decides the suicides rate for elderly males and females. (G. Gururaj, 2010) found that lack of religious belief & domestic violence, are also a major risk factors for suicide.

Research Objective

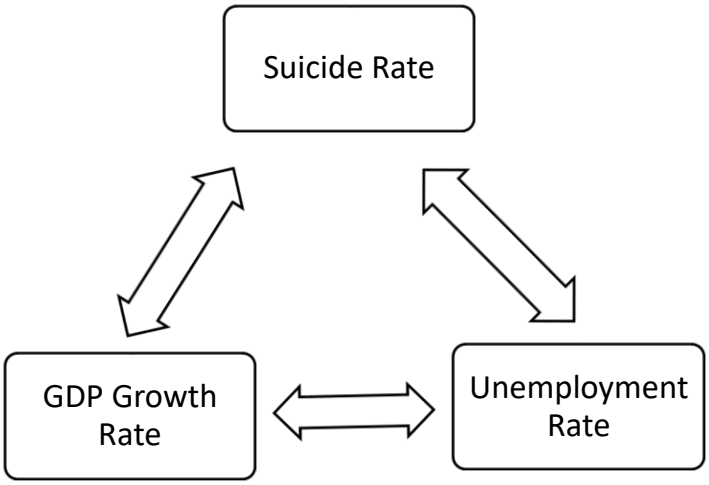
To explore the influence on suicide in Asian regions in the context of rapid economic development and unemployment rate fluctuations.

Research questions:

1. How the suicide rates of South Asian economies behaved in past 2 decades?
2. Does the unemployment rate influence on suicide whilst the constant economic growth?
3. Does the economic growth influence the suicide whilst the unemployment rate held constant?

The conceptual model (see figure 2 below) illustrates based on the economic platform the link between suicide rates and two major economic situations in a country is shown. These two dimensions and suicide rates have later been experimented with the help of more specifically to find the directions of each influence with respect to a compounding variable at a time.

Figure 2: Conceptual Framework



2. LITERATURE REVIEW

Title	Authors	Sample	Methods	Results
More than just numbers suicide rates & the economic cycle in Portugal	Joao Pereira Dos Santos, Marina Tarares & Pedro Pita Barros	1910-213 Yearly Data of Portugal- GDP, suicide rate, Infant Mortality, Marriage growth rate, No of gov. changes	Dicky Fuller Unit Root test AR model	A strong association between a declining growth rate & real output increase in suicide rate for the population
The Economy & suicide – Time series study of the U.S.A	Bijon Yang	1940-1984 – four sex by race social groups	Simple Regression	Suicide rate did not increase during booms & busts. Unemployment rate had impact on white male suicide rate
Trend in para suicide & unemployment among men in Edinburgh	S. Platt & N. Kreituan	1968-1982 – Unemployment rate & annual para suicide cases	Correlation Coefficient	Unemployment & annual para suicide incidences positively & highly correlated.
Unemployment & suicide mortality suicide attempts & suicide ideation – A Meta-	Soharb Amiri	Lasted 2020	Pooled odds ratio	Unemployment is associated with an increase odd of suicide & the

Analysis				odds ratio is 1.85
Suicide, unemployment and other socio economic factors-evidence from economic crisis in Greece	Michele G. Madianos , MD et all	1990 – 2011 Public debts, suicide mortality rate, divorce/1000, homicides/100000, HIV/100000 unemployment rate	Correlation Coefficient	Suicides have been found to bear strong correlation with unemployment (r. 0.64), Significant associations between suicide mortality and public debt %
Suicide as a reason of adverse market sentiment	Pankaj Agrrawal,Dong Waggle & Danniel H.	1980 – 2016 – GDP growth, inflation, stock market return unemployment & suicide rates.	Correlation Coefficient	Suicides tend to rise in economic turmoil, such as the recent Great Recession of 2008. (GDP) growth rate-negatively unemployment rate-positive inflation-positive stock market returns adjusted for the risk-free T-Bill rate-negative links.
Attempted suicide in Sri Lanka an epidemiological study of household & community factors.	DW Knipe, D. Gunnell et all.	2018 – 165,233people 47,919 households in 171communities in rural Sri Lanka.	3 - level logit models Contextual effects.	A significant variation between households 21% and communities 4% in the risk of a suicide attempt.

Research Gap

As a developing country, the suicide rate of Sri Lanka has been significant lately and none of the researchers have analysed this crisis comparatively with neighbour emerging South Asian Economies.

METHODOLOGY

The collected data of South Asian countries for the year 2000 to 2020 were chosen to overview the behaviour of suicide rates including the two most recent periods of serious economic upheaval such as global financial crisis of 2008 and the current global COVID-19 pandemic. Both economic crises can be viewed as decent reference points with which to test (Durkheim, 1952) thesis that economic and societal upheaval lead to higher suicide rates.

The Asian countries which have been considered for the study were: Sri Lanka, India, Maldives, Pakistan, Nepal, Bhutan, Bangladesh and Afghanistan, whose development started more recently.

Suicide Rate (per 100000 population):

Age-standardized suicide rates are the total number of suicides in a country standardized for differences in population size and age-structure were collected from the World Health Organization's mortality database (World, 2019) and every form of intentional self-harm were included when calculating the country specific rates.

Here, for the purpose of well exploration of the suicide rate of each country both female and male suicide rates were also collected so that it can be used for the descriptive analysis of the gender preference of self-harming.

GDP Growth Rate:

GDP is a major indicator of economic growth and its growth rate has been standardized in order to adjust the differences in population sizes (per capita) and differences in price levels (PPP, purchasing power parities). It is one of the most often used indicators of economic development, since it measures a country's total economic output over a year. The data for this variable was retrieved from the databases of the Economic Indicators of Central Bank of Sri Lanka since this database contains data on Sri Lankan economy up-to-date.

Unemployment Rate:

The proportion of the labour force that is not currently employed but could be is called Unemployment Rate. The Bureau of Labour Statistics uses six different ways to calculate the unemployment rate by using different criteria. The most descriptive statistic reported method is called the U-6 rate, but most widely used is the U-3 rate.

To calculate the U-3 unemployment rate, the number of unemployed people is divided by the number of people in the labour force, which consists of all unemployed and employed people. The ratio is declared as a percentage.

Equation 1: U3 Unemployment Rate

$$\textbf{U-3= Labour Force / Unemployed} \times 100$$

South Asian Countries:

South Asia is the southern region of Asia, which is defined in both ethnocultural terms and geographically. The region consists of the countries: India, Pakistan, Sri Lanka, Maldives, Afghanistan, Bangladesh, Bhutan and the Nepal.

Data Analysis

It is a common requirement to observe a better understanding on the data that are dealing in every research component. For that purpose, most researchers use descriptive analysis in their research analysis. Simply that is the basic analysis of the data analysis procedure. As the first step of the descriptive analysis, first suicide rates are explored and checked how recently suicide activities are developed in Asian countries and to which extent suicide epidemiology has converged between the selected South Asian economies. The descriptive analysis entailed the remarks of the raw suicide rates for each of the eight South Asian economies over the period 2000-2020. Secondly the raw suicide data were analysed against the gender, so that to clarify the gender preference of harming themselves. Female and Male suicide rates were analysed using both graphically and descriptively towards each South Asian economy. As the major economic indicator, the GDP growth rate and unemployment rates were then analysed with respect to the countries.

Then, in order to explore the predictive power of economical dimension the economic climate on suicide rates, after testing all necessary assumptions partial correlation is used as the inferential statistics. The test has been conducted twice individually to each country with controlling GDP rates and unemployment rates. Each individual case represents the corresponding year suicide, GDP and unemployment rates of the country.

Analyses were performed by using the SPSS. For more comprehensive inferential analysis the partial correlation is performed, first by controlling the effect of GDP and secondly, again the unemployment effect was controlled.

Partial Correlation

Partial correlation refers to studying the linear relationship between two variables by excluding the effect of one or more independent factors. The difference between the general form of correlation and the partial correlation is the exclusion of the influence of other factors in order to get the correct and pure understanding of the relationship between two factors.

Generally, no variable is influenced by only one factor but may have simultaneously affected by so many other variables. Simply the simple correlation ignores the fact that both considering variables may be influenced by some other one or more variables. Therefore, when the simple correlation calculating no variables are held constant.

The correlation coefficient between two variables X, Y tested partially after excluding the influence of the one variable Z from both of them, is known as the partial correlation co-efficient $r_{XY.Z}$. The partial correlation co-efficient also varies between -1 and +1. This technique is highly used in situations where many interrelated phenomena are to be studied at a single time.

The general concept in partial correlation analysis is the coefficient $r_{xy.z}$ between variables X and Y, adjusted for the variable Z . Both X and Y are assumed to be linearly related to Z.

ANALYSIS

Descriptive Data Analysis

In order to get a realistic view of the data the descriptive analysis has been taken over the values of each respective variables. The descriptive data were calculated under several sections where first the panel data were analysed with respect to the year and then unpanelled data were analysed against the respective country wise.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Variance
SuicideRate_mean	20	7.87	11.91	9.4599	1.624
SuicideFR_mean	20	4.51	7.31	5.5131	.814
SuicideMR_mean	20	11.47	16.52	13.5203	2.476
GDPGrowth_mean	20	.06	10.58	4.1685	4.707
UnemploymentRate_mean	20	4.31	5.72	4.8153	.133
Valid N (listwise)	20				

Table 1: Descriptive Statistics

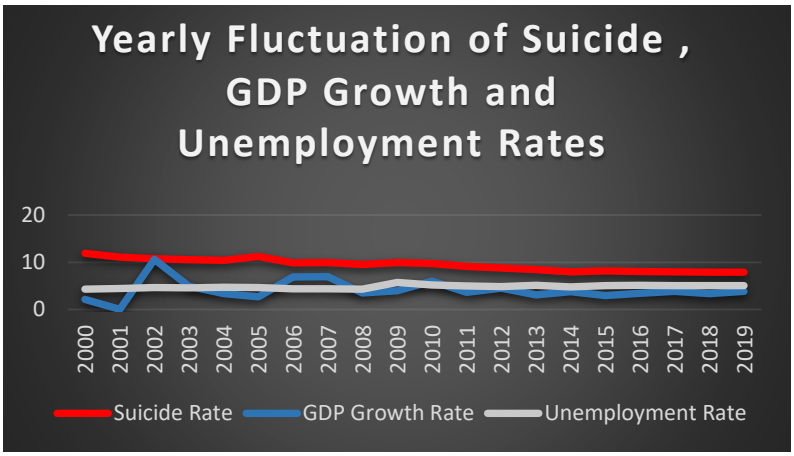
Source (Sample Data)

The values of table 2 depict that from all years the minimum mean suicide rate was 7.87 and it has been occurred in year 2019 as well the maximum mean suicide rate was occurred in year 2000. The mean suicide rate for all corresponding year from suppressed countries mean suicide rate has been resulted as 9.45 which indicates that in south Asian countries for the respective considered years for every 100 000 people, almost 9 people committed suicide.

According to the resulted data the mean, male suicide rate is significantly higher than the mean female suicide rate in south Asia. Further, the maximum mean male suicide rate was occurred in year 2000 and its minimum value resulted in recent year 2019. When it comes to the mean female suicide rates

the maximum value occurred in 2000 year while its minimum was recorded in year 2017. As the researcher has mentioned in introduction the Asian countries are well aligned to the South Asian economies. Here, the mean GDP growth of Asia for past 20 years, it indicates 4.16 percentage. Hence, the maximum GDP growth rate has been recorded in year 2002 while the minimum was recorded in 2001. The minimum mean Unemployment rate was recorded in 2000 while the maximum was resulted in year 2009. Hence, the mean of the South Asian unemployment rate for the accounted time period has been recorded as 4.815 while the mean of the South Asian GDP growth is 4.16

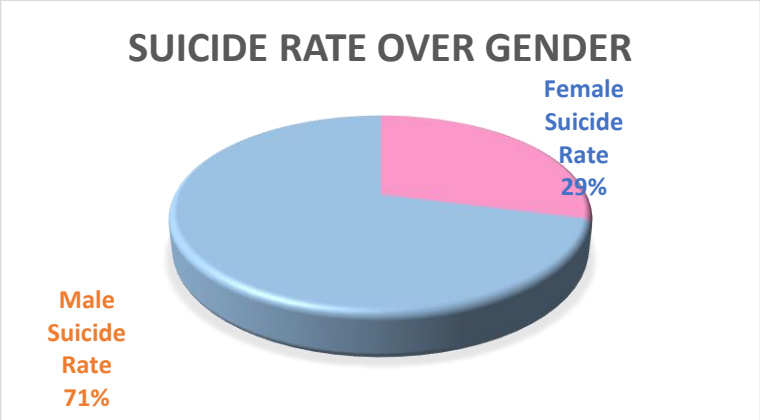
Figure 3 : Yearly Fluctuation of Aggregate Variables of suicide rate, GDP growth rate and Unemployment Rate



Source (Sample Data)

According to the above fig: 3, line chart, it clearly depicts that compared to the GDP growth rate and the unemployment rate the suicide rate is relatively high. It also shows that there is low volatility in the unemployment rate comparatively to the GDP growth. Here, these data were drawn from the panelled data series so that the researcher wants to emphasize the behaviour of the suicide rate and the economic growth of the South Asian economies.

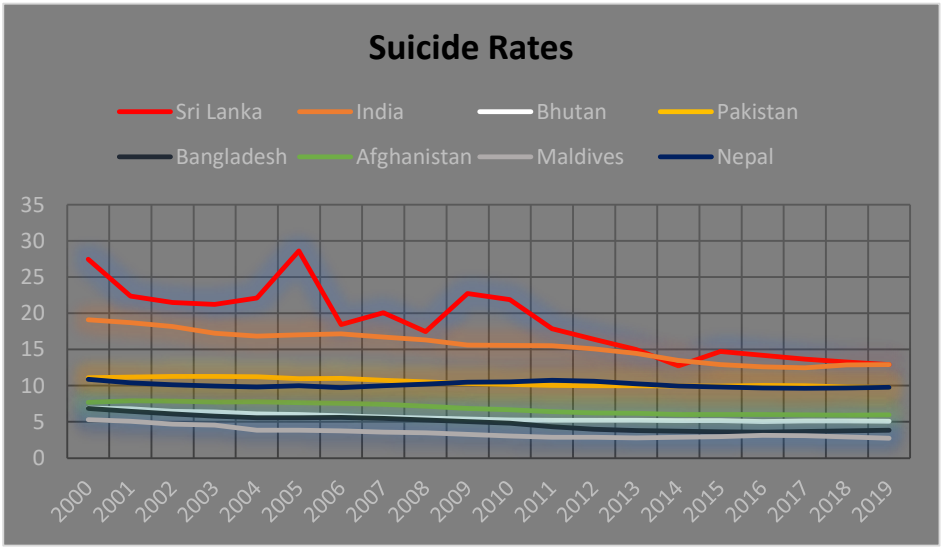
Figure 4: Suicide Rate over Gender



Source (Sample Data)

The above pie chart is occupied to explore the suicide rate proportion against the gender and significantly it reveals that the male suicide rate is considerably higher than the female suicide rate. Numerically 71% from the total suicides in South Asian countries were committed by males.

Figure 5: Country wise Suicide Rates

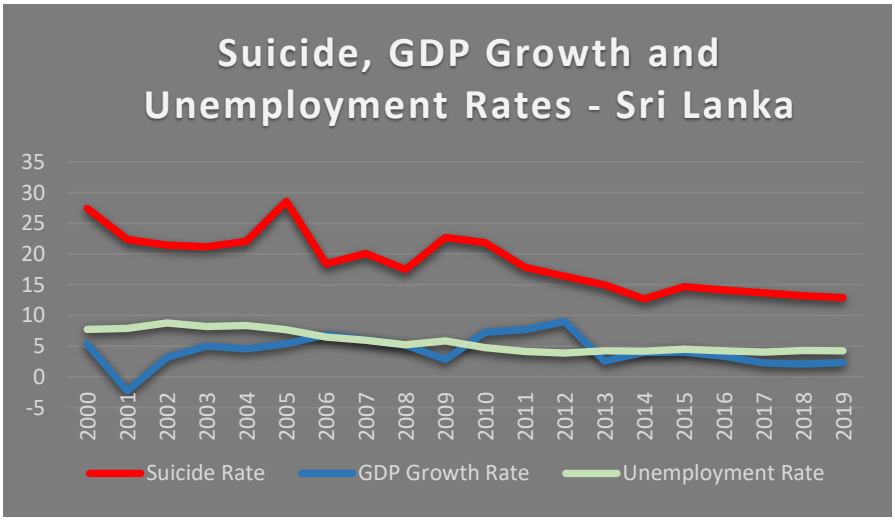


Source (Sample Data)

The fig:5 Line chart denotes the suicide rates of each country along the recent 20 years which have been analysed using the unpanelled data series. This indicates suicide rates for the eight countries have been fluctuated to several degrees and developed in different directions. As it shows from all south Asian countries, Sri Lanka has been held a significant role from the beginning of 2000 while the peak was recorded at the year 2005. It is recorded as 28.58 in year 2005. Moreover, the increase in years 2008, 2009 may coincide with the Asia crisis and the global financial crisis and this could sign at the impact the economic position has on suicide rates. Hence this tends to decrease by the year 2011 onwards and at 2019 India has taken over the lead. As per the recent records, it highly states that the least suicide rate recorded from Maldives and the Bangladesh suicide rate is substantially lower than the other countries. The countries Bangladesh, Bhutan and Afghanistan suicide rates lines tends to move more closely within the considered time period of 20 years indicating more stabilizing pattern.

This led the researcher to explore the individual behaviour of the suicide rate towards the GDP growth and the Unemployment Rate of Sri Lanka. Since this remarkable behaviour the risk of increasing the suicide rate can be expected investigating deeper in the Sri Lankan context is analysed.

Figure 6 : Suicide, GDP growth and Unemployment Rates in Sri Lanka



Source (Sample Data)

From the resulted line chart, it revealed that the as per the records still the country's suicide rate is comparatively higher than the GDP growth rate and the unemployment rate. Furthermore, the unemployment rate has been maintained a smooth flow against the country's GDP growth and currently as the beginning of the millennium year 2000, it is higher than the GDP growth rate. This has highly recommended the researcher's research objective more precisely.

Then the numerical description of the considered variables was obtained using the SPSS 26 software and all five variables were described with respect to the corresponding countries.

Table 2: Country wise Descriptive Data

Country		SuicideRate	SuicideFR	SuicideMR	GDPGrowth	UnemploymentRate
Sri Lanka	Mean	18.7150	8.7390	29.7810	4.336503	5.741000
	Minimum	12.72	5.11	20.94	-2.2437	3.8800
	Maximum	28.58	18.37	41.46	9.0039	8.7600
	Variance	22.283	9.619	42.828	6.248	3.051
India	Mean	15.5305	13.1745	17.8845	5.170879	5.550500
	Minimum	12.48	10.69	14.27	1.5876	5.2700
	Maximum	19.09	17.36	20.90	7.0423	5.7300
	Variance	4.475	3.927	5.598	3.051	.023
Bhutan	Mean	5.6330	3.6440	7.3640	5.776799	2.657000
	Minimum	5.05	3.08	6.74	.8755	1.6400
	Maximum	6.91	5.04	8.63	17.0318	3.9600
	Variance	.369	.437	.355	11.788	.466
Pakistan	Mean	10.4600	5.3210	15.3170	1.924274	1.678500
	Minimum	9.77	4.75	14.55	-1.0340	.4000
	Maximum	11.28	5.93	16.28	5.2230	4.0800
	Variance	.321	.176	.451	3.422	2.043
Maldives	Mean	3.5390	1.2015	5.4285	2.194478	5.191500
	Minimum	2.76	.84	4.07	-15.3967	1.9700
	Maximum	5.30	2.27	8.07	23.0774	11.7000
	Variance	.625	.194	1.555	58.412	7.837
Afghanistan	Mean	6.8455	6.6450	6.9915	5.736048	11.462000
	Minimum	5.91	5.50	6.11	-5.7000	11.0600
	Maximum	7.89	7.89	7.95	65.0000	11.9800
	Variance	.613	.709	.540	232.408	.050
Nepal	Mean	10.1085	2.9095	18.2800	3.443310	2.143000
	Minimum	9.63	2.63	17.03	-1.4126	1.3300
	Maximum	10.87	3.06	19.35	6.7898	3.1000
	Variance	.142	.013	.463	3.849	.388
Bangladesh	Mean	4.8480	2.4700	7.1160	4.765601	4.099000
	Minimum	3.60	1.64	5.43	1.9604	3.2700
	Maximum	6.87	3.46	10.03	7.0450	5.0000
	Variance	1.119	.392	2.061	1.743	.179

Source (Sample Data)

Inferential Analysis

Each country has been analysed using the partial correlation tool, first by controlling the GDP growth rate and secondly by controlling the Unemployment rate. By satisfying all the assumptions of the partial correlation the testing of country by country has been conducted.

The Shipro Wilk test P value is greater than the 0.05 significance value and therefore it can be shown that the suicide rate data are normally distributed.

Fundamentally, the influence by the economic growth has been confounded and checked for the correlation of suicide rate and the unemployment rate. The partial correlation has been tested for each individual 8 countries and the resulted outputs are as below.

Table 3: Sri Lanka partial correlation between the Suicide rate and unemployment rate

Partial Correlations

Control Variables			SLSR	SLUR
SLEGR	SLSR	Correlation	1.000	.824
		Significance (2-tailed)	.	.000
		df	0	17
	SLUR	Correlation	.824	1.000
		Significance (2-tailed)	.000	.
		df	17	0

Source (sample data)

By the table 5, it displays the relationship between the suicide rate and unemployment rate in Sri Lanka when the influence of the economic growth is confounded. Here, the level of significance is less than the 0.05, therefore it reveals that there is a significant relationship between these two variables and by the partial correlation coefficient, since it is positive and 0.824 which technically says a positive as well as a strong relationship. This means when the effect of economic growth is constant on the suicide rate the effect of unemployment rate is highly related to increase the suicide rate in Sri Lanka.

Table 4: India partial correlation between the Suicide rate and unemployment rate

Partial Correlations

Control Variables			INDSR	INDUR
INDEGR	INDSR	Correlation	1.000	.458
		Significance (2-tailed)	.	.049
		df	0	17
	INDUR	Correlation	.458	1.000
		Significance (2-tailed)	.049	.
		df	17	0

Source (sample data)

When India is considered, the impact of economic growth has freeze the unemployment rate and the suicide rate indicates a lower correlation which is insignificant P value of 0.049. This can be expressed as compared to Sri Lankan situation the relationship of unemployment rate and suicide rate is positive and low but not zero. Therefore, it cannot be ignored though it is insignificant.

Table 5: Malaysia partial correlation between the Suicide rate and unemployment rate

Partial Correlations

Control Variables			MALSR	MALUR
MALEGR	MALSR	Correlation	1.000	-.708
		Significance (2-tailed)	.	.001
		df	0	17
	MALUR	Correlation	-.708	1.000
		Significance (2-tailed)	.001	.
		df	17	0

Source (sample data)

In Malaysia, the relationship between the suicide rate and the unemployment is negative and it is also technically significant. The coefficient indicates negative 0.708 value which can be expressed as a strong relationship that goes opposite directions when the impact of economic growth is confounded.

Table 6: Pakistan partial correlation between the Suicide rate and unemployment rate

Partial Correlations

Control Variables			PAKSR	PAKUR
PAKEGR	PAKSR	Correlation	1.000	-.762
		Significance (2-tailed)	.	.000
		df	0	17
	PAKUR	Correlation	-.762	1.000
		Significance (2-tailed)	.000	.
		df	17	0

Source (sample data)

In Pakistan when the influence of economic growth is controlled the relationship between the suicide rate and unemployment rate is significant and it can be examined that both of them has a negative strong relationship which is 0.762 in magnitude. This indicates that the suicide rate and the unemployment rate move opposite directions.

Table 7: Afghanistan partial correlation between the Suicide rate and unemployment rate

Partial Correlations

Control Variables			AFGSR	AFUR
AFEGR	AFGSR	Correlation	1.000	.214
		Significance (2-tailed)	.	.380
		df	0	17
	AFUR	Correlation	.214	1.000
		Significance (2-tailed)	.380	.
		df	17	0

Source (sample data)

In Afghanistan the correlation of suicide rate and the unemployment rate is technically insignificant when the influence of economic growth is controlled. Since the partial correlation coefficient is positive and not zero, it cannot be ignored as that there is somewhat relationship available which means for some extent the suicide rate and unemployment rate has same directional relationship but considerably low.

Table 8: Nepal partial correlation between the Suicide rate and unemployment rate

Partial Correlations

Control Variables			NEPSR	NEPUR
NEPEGR	NEPSR	Correlation	1.000	-.433
		Significance (2-tailed)	.	.064
		df	0	17
	NEPUR	Correlation	-.433	1.000
		Significance (2-tailed)	.064	.
		df	17	0

Source (sample data)

When the economic growth influence is confounded the relationship between the suicide rate and the unemployment rate in Nepal is statistically insignificant but not zero. Since the coefficient is negative and 0.433 it shows opposite directional somewhat relationship between these two variables.

Table 9: Bhutan partial correlation between the Suicide rate and unemployment rate

Partial Correlations

Control Variables			BHUSR	BHUUR
BHUEGR	BHUSR	Correlation	1.000	-.494
		Significance (2-tailed)	.	.032
		df	0	17
	BHUUR	Correlation	-.494	1.000
		Significance (2-tailed)	.032	.
		df	17	0

Source (sample data)

The relationship between the suicide rate and the unemployment rate when the impact of economic growth is constant in Bhutan is resulted statistically significant and according to the coefficient it can be expressed that the suicide rate and unemployment has an opposite directional relationship in magnitude 0.494 which can be considered as moderate.

Table 10: Bangladesh partial correlation between the Suicide rate and unemployment rate

Partial Correlations

Control Variables			BANGSR	BANGUR
BANGEGR	BANGSR	Correlation	1.000	-.525
		Significance (2-tailed)	.	.021
		df	0	17
	BANGUR	Correlation	-.525	1.000
		Significance (2-tailed)	.021	.
		df	17	0

Source (sample data)

In Bangladesh the correlation between the suicide rate and the unemployment rate is statistically significant when it controlled the economic growth of Bangladesh is confounded and by the coefficient it can be expressed that they have a negative but moderately strengthen relationship since the magnitude is nearly 0.5.

After reviewing the correlations by holding the influence of economic growth then changed and checked for the correlation between the economic growth and the suicide rate at the time when the unemployment of the economy is upheld. The resulted outputs are below.

Table 11: Sri Lanka partial correlation between the Suicide rate and Economic Growth

Partial Correlations

Control Variables			SLSR	SLEGR
SLUR	SLSR	Correlation	1.000	.426
		Significance (2-tailed)	.	.069
		df	0	17
	SLEGR	Correlation	.426	1.000
		Significance (2-tailed)	.069	.
		df	17	0

Source (sample data)

In Sri Lanka, when the unemployment effect is constant the relationship between the suicide rate and the economic growth is statistically insignificant but cannot be ignored since directionally positive and in magnitude 0.426.

Table 12: India partial correlation between the Suicide rate and Economic Growth

Partial Correlations

Control Variables			INDSR	INDEGR
INDUR	INDSR	Correlation	1.000	-.549
		Significance (2-tailed)	.	.015
		df	0	17
	INDEGR	Correlation	-.549	1.000
		Significance (2-tailed)	.015	.
		df	17	0

Source (sample data)

In India when the influence of unemployment rate is controlled the relationship between the suicide rate and economic growth is statistically significant and the coefficient indicates a negative moderate strength relationship with a magnitude of 0.549.

Whilst controlling the unemployment influence for the suicide rate and economic growth the partial correlation between the suicide and economic growth indicated a statistically insignificant relationship but since the correlation coefficient resulted negative directional and in magnitude 0.224, this can explain that the economic growth has a considerably lower influence on suicide rate in Malaysia. Even in Pakistan the results can be expressed as same to the Malaysia since the results are statistically insignificant, the influence of economic growth on suicide rate is not zero means it is really lower but directionally positive whilst the unemployment factor held constant.

In Afghanistan, Nepal, and Bhutan also the correlation of the suicide and the economic growth resulted statistically insignificant but it cannot be told that there is no relationship between these two variables since the coefficient is not zero but a positive value of 0.242. According to the magnitude of the correlation also it can say that the relationship is avoidable.

Table 13: Bangladesh partial correlation between the Suicide rate and Economic Growth

Partial Correlations

Control Variables			BANGSR	BANGEGR
BANGUR	BANGSR	Correlation	1.000	-.762
		Significance (2-tailed)	.	.000
		df	0	17
	BANGEG	Correlation	-.762	1.000

	R	Significance (2-tailed)	.000	.
		df	17	0

Source (sample data)

Whilst the influence of unemployment is lifted the impact of economic growth on suicide rate is statistically positive and it was negative directional with a magnitude of 0.762 which indicates a strong interrelationship.

CONCLUSION AND DISCUSSION

Suicide is a paradoxical decision, and it has an obvious negative impact on friends, families and society. It is a complex event which is a result of the interaction between numerous potential factors. The Shipro-Willks test suggests that the number of suicide cases follows a normal distribution in the years of interest in the general population. Being made unemployed is calamitous. The impact is not simply the economic burden of confront with a significantly reduced income. By the descriptive analysis, it clearly states the effect on men are considerably higher than women.

Although from few years back, Sri Lanka has led the suicide rate curve relatively to other Asian countries and it is still in the close run with the neighbouring country, India. This research has shown that suicide rates in South Asia have developed in different directions over the period 2000-2019. Sri Lanka seems to have experienced the most drastic change in suicide rates over the twenty year period, since its suicide rates have more than doubled.

Suicide rates for the Maldives, Bangladesh, Afghanistan and Bhutan have remained stable, their rates have been persistently lower compared to the other South Asian economies. Finally, the suicide rates of these South Asian economies have shown no signs of converging. In the descriptive analysis of suicide rates, most South Asian economies showed fluctuating suicide rates in times of an economic crisis, directing at the possible influence of an economy has on suicide rates. With the help of partial correlation analyses it was found that among eight South Asian economies only the Afghanistan and Nepal have shed insignificant influence between the unemployment and the suicide rate whilst controlling the impact of economic growth and all other economies' suicide decisions are at least moderately influenced by the unemployment factor. When it comes to lifting the unemployment factor from all eight countries only India and Bangladesh have a considerable influence from economic growth on suicide and all other countries had insignificant or considerably lower influence on suicide rates between the considered time period of 20 years.

GDP per capita was found to have insignificant but negative directional interrelation in most countries. A positive association was found in the interaction effect of GDP growth and the

unemployment rate. Therefore, the researcher cannot ignore the evidence that the practical situation where and when the economic growth increase, the suicide rate is decreasing. Undoubtedly the link between unemployment rate and suicide rate is realistic. The potential labour forces are not fully utilized and underutilized skilled labour market in South Asian economies is expectable. High rate of inflation as well as the political instability may have an invisible hand on this employment gap and this has been mainly affected to the male sector than the female sector. Moreover, poverty and high life expectancy as well as higher population can also be identified as influencing factors for the future studies. In final conclusion, understanding the causal like between the economic growth rate, unemployment rates and suicide rates is a momentous necessity to policymakers, so that they can activate the appropriate necessary unemployment strategies to reduce suicide rates especially remarking the economic recession results in higher suicide rates and one possible explanation for this can be not only the shock of losing a job but the consequent loss of economic status. The factual results as illustrated in our study have vital implications for the Sri Lankan government regarding the remarkable flow of the suicide rate and furthermore future researchers should give an opportunity to seek why it is more prevalent among males than women.

However, behind these statistics there is an inexpressible personal and family tragedies, the long-term impacts which is difficult to measure numerically.

LIMITATIONS

This paper went through some common and specific limitations. First, the major limitation is that due to the lack of data collected on suicidal rate in South Asia the considered period may not be enough for a strong prediction and although research is occupied with reliable sourced validated official data, there could be an under-registration or unobserved number of suicides in several contexts since reporting of suicide information are sensitive due to its social stigma that could have led to underreporting of suicide information. If this was the crisis, the effect of the economic crisis on the evolution of suicide rates must have got underestimated. Secondly, in this research it was not possible to control all possible confounding. Identified risk factors for suicide include economic growth and unemployment, these factors may not be distributed evenly across the general population. Further there are hundreds of other economical as well as social factors that can occur to influence the suicide rate such as domestic violence, sexual abuse, marriage complications and even the academic depressions and drug addictions. These factors also play a vital role and omitting these factors from the current model may have underestimated the behaviour of the actual model.

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