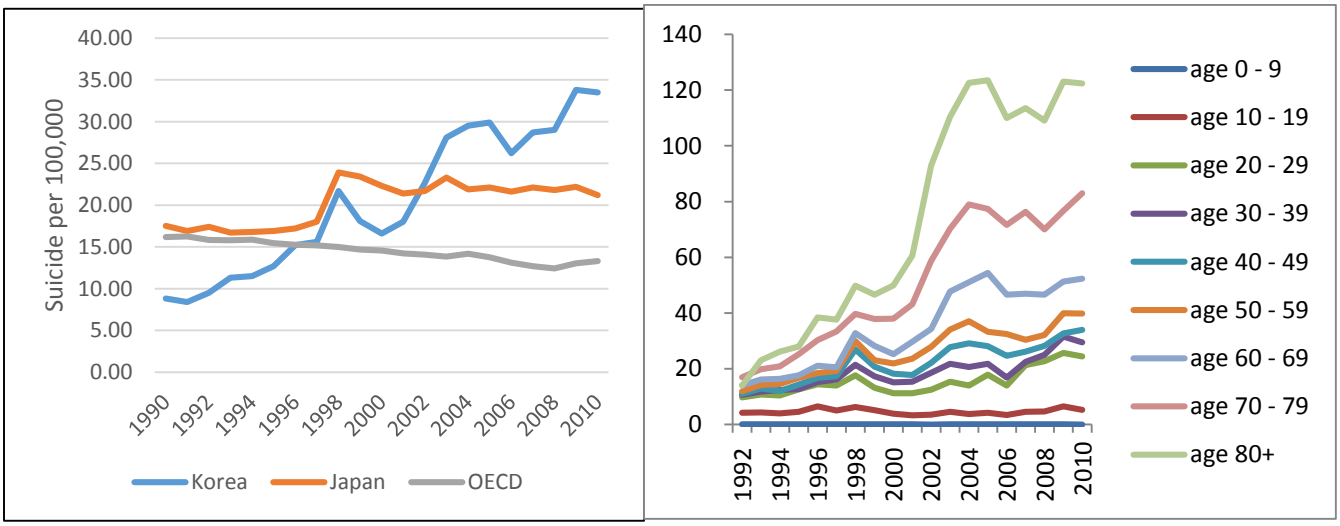
『Regional differentials in age group specific suicide rate in South Korea 2005-2010 』

1. Introduction

Suicide is being one of the most prevalent causes of death in South Korea (NSO 2013). Suicide is the most frequent cause of death (1st in 10~39 years old, 2nd in 40~59 years old, just below cancer). Commonly, death is what most of human beings want to get away from. Therefore, suicide can be considered as a strong indicator of 'abnormality' of life. Because it means some people are trying to choose death instead of life because of severe reasons disrupting their normal life. Also, it is obvious that death of suicide has huge negative impact not only for the individuals but also society. Usually, suicide generates bereavement impacts to their friends and family (Mishara 1995), and community with "Werther Effect" (Phillips 1974) Recently, South Korea has been one of the top countries in suicide rate. From 2003, suicide rate of South Korea started to exceed that of other countries It was due to sharp increase of suicide rate of South Korea after 1990. In 2010, suicide rate increased about three times higher than that of 1990, in contrast to the suicide rate of Japan has been stabilized from 1998, relatively. Overall suicide rate of OECD countries has been decreased yearly (OECD 2013).



< Figure 1: Trend of suicide rate in South Korea and Japan, OECD countries and Age groups>[1]

Diverged suicide rate within country can be considered as severe issue in South Korea. In 1992, gaps among age group specific suicide rate were almost similar. Although there were steep increase in 1998, uprising trend was occurred in all of the age groups and stared to decrease soon. However, after the beginning of the 21st century, elderly suicide rate increased so sharply than younger age groups. The gap among suicide rate became more divergent until 2005. After then, upward trend of elderly suicide rate was relented. But the gaps between elder and younger age groups is still lager than others. Also, according to the mortality data, the highest suicide rate by area (administrative units, similar to counties in the U.S.) was about 7.1 times higher than the lowest one. What is worse, elderly suicide rate shows more severely differentiated gap. The highest suicide rate by administrative units was

[1] Source : "OECD Factbook" (OECD, 2013) and " Mortality Statistics" (National Office of Statistics of Korea, 2013)

about 14.2 times higher than the lowest one. It indicates that huge gap between regions really exist in South Korea. Some regions show more severe mortality, especially in suicide rate. We can expect that some risk factors exacerbate inequalities of mortality and morbidity in South Korea.

Interestingly, researches about suicide in South Korea usually focused on suicidal ideation and other psychological factors based on small survey. Because there are limitations of data about suicide. Many studies just roughly utilized province level (similar to state level data in the U.S.) or overall suicide rate using only single year, despite this country is suffering from steep increase in completed suicide, diverged by age(Choi 2011, JeoungHee 2011, Kim and Kwon 2013, Kim and Kim 2011, Kim 2010, Shin 2007, Song et al. 2013). Therefore, conducting study to see influential factors to differentials of suicide rate by age group and region can contribute overall understanding to severe social disorder in current South Korea.

2. Theoretical Focus

The most famous and powerful sociological study of suicide is Durkheim's Suicide: A Study of Sociology. Durkheim argued that suicide is a social fact and it is in the research area of sociology. The lack of social integration leads suicide because of losing social regulation leads to anomic status which is pervasive in modern society (Durkheim 1951) . Although individuals choose to commit suicide with their decision, Durkheim considered suicide as a social phenomenon because suicide happens when society is not integrated to a proper degree. In other words, suicide should be understood as a social fact because it happens when society does not work well. Durkheim's perspective became basic theory for investigating suicide in Sociology (Wu 2010). Although many sociologists have tried to overcome Durkheim's study, they were considered as just adding virtually nothing of significance to Durkheim's theory (Evans and Farberow 2003). A number of studies about suicide still follow Durkheim's perspective about social integration and related influential factors. But it is hard to deny that Durkheim is the most important scholar in the field of suicide studies. In many studies about suicide, authors just utilized secondary data such as survey that has small number of cases. Also, they just limited their issue in micro, psychological perspectives like suicidal ideation and opinions about suicides. Although there are few academic researches dealt with completed suicide, only used 2~3 variables(Ryu 2008) or applied simple correlation (Eun 2005) or used single cross-sectional study by using simple suicide rate by area (Kang 2013) .

3. Data and Research Method

Regional suicide rate will be tested with prior theories connected to regional statistics. To conduct empirical examination with regional suicide rate, fixed effect regression model will be utilized to test the relationship between macro socioeconomic statistics and suicide rate by age group in South Korea. Controlling effects of period from 2005-2010 will contribute to find time-invariant regional indicators affecting suicide rates (Judith and Melinda 2011) .Suicide rate of each age group by area can be calculated by Mortality statistics data containing causes of death produced by National Statistics Office. This data is collected by vital registration record of individuals. Regional population data was calculated from 'Number of registered population' data collected by Ministry of Public Administration and Security, population of each area by age. Also, I could utilize regional statistics data produced by Korea Social Science Data Archive covering regional statistics from 2005 to 2010 (KOSSDA 2013) It was re-calculated with many sources of data form government agencies such as 'Population Survey (Census)', 'Labor Demand Survey', 'Present Situation of Social Facilities'. Units of

analysis are 251 areas of South Korea. Although size of basic units of analysis (areas) are much smaller than counties of U.S.A., it helps us to collect aggregated death record data from individuals. It is almost impossible to find information of deaths, especially by suicides. By using regional statistics, suicide rate of each region and related predictors by official records and statistics. Naturally, there are a lot of limitations of community level data such as ecological fallacy problems, unreliably reported dataset and banned to be opened to public. However, it is effective way to find regional divergences by statistics of competed suicide rate in South Korea. Key dependent variable of this study is the rate of total suicide per 100,000 in 2005-2010. I calculated regional total suicide rate as number of suicides divided by number of population and standardized as the rate per 100,000.

Dependent variables for this paper are regional suicide rate from 2005-2010, calculated from 'Mortality statistics by causes of death data.[2]. It will be regional–age specific suicide rate to analyze more detailed pattern of the suicide rate trend from 2005 to 2010. To find relationship between risk factors and suicide rate, some sets of independent variables will be utilized. First of all, to measure aging level of the region, total and elderly dependency ration will be utilized. Low figures mean relatively younger region than others and high figures mean elder region than others. Also, to make indicators for socio-economic status of areas, proportion of collegiate degree holders and fiscal self-reliance ratio and number of registered cars were calculated from Census data from National Statistics Office. Also, crude divorce, marriage rate and total fertility rate will be used to measure family security level will. To measure infrastructural development, I can classify whole regions by two categories as 'urban area' and 'rural area'. Areas can be divided into two big categories. City (Si) is consisted with Gu (relatively larger subdivision of city) and Dong (relatively smaller subdivision of city). But rural area (Gun) is consisted with Eup (relatively larger subdivision of rural area, gun) and Myeon (relatively smaller subdivision of rural are, gun). So areas can be categorized as city and its subdivisions as 'city' and rural area and its subdivisions as 'rural' area. Also, proportion of paved road (length of paved road divided by length of whole roads) as social overhead capital (SOC) indicates relative development level and local economy. Also, population density was calculated by area level to see relative social integrity.

< Table 1: Mean of selected regional statistics 2005-2010 >

	2005	2006	2007	2008	2009	2010
Suicide rate	27.24	24.12	26.41	27.17	31.90	31.28
Total Fertility Rate	1.15	1.19	1.35	1.28	1.25	1.33
Crude Marriage rate	5.79	6.16	6.36	6.02	5.66	5.97
Crude Divorce Rate	2.46	2.41	2.39	2.21	2.38	2.26
% over college degree	15.84	15.84	15.84	15.84	15.84	17.96
% of paved road	70.90	77.59	78.26	78.50	79.25	79.76
Population Density	4265.78	4301.66	4318.06	4305.58	4293.75	4323.62
# of registered cars per 1,000	31.56	32.44	33.34	35.18	36.39	37.44
% Fiscal self-reliance	56.20	54.40	53.60	26.86	27.33	26.67

[2] Causes of death followed 'International Classification of Diseases' codes. X700~X849 indicate intentional self-harming

4. Expected findings

By using regional statistics as indicators, I expect to find general trend of age-specific regional suicide rate through 2005-2010. As elder group showed steep increase in suicide rate, what regional indicators affect them more influentially? Also, what are age-specific risk factors of each age group? Does it differ by period? By completing this study, I expect to find differentials in determinants of suicide by age group and gender. It will give various insights for more effective understanding of suicide to build suicidal prevention policies in South Korea.

5. References

Choi, Yong-Hwhan. 2011. "Socio-Economic Analysis of Suicide." *Issue and Diagnosis* 3:1-25.

Durkheim, Emile. 1951. *Suicide: A Study in Sociology*. London: McMillan.

Eun, Ki-Soo. 2005. "Socioeconomic Determinants of Suicide Rate in South Korea." *Korean Journal of Population Studies* 28(2):97-129.

Evans, Glen and Norman L. Farberow. 2003. *The Encyclopedia of Suicide: Second Edition*: Facts on File Inc.

JeoungHee, Kim. 2011. "Concerning Suicide Rates in Korea: An Expected Role of Korean Scholarly World." *HEALTH AND SOCIAL SCIENCE* 30:5-28.

Judith, K. Hellerstein and Sandler Morrill Melinda. 2011. "Booms, Busts, and Divorce." *The B.E. Journal of Economic Analysis & Policy* 11(1).

Kang, Eun-Jeong 2013. "Compositional and Contextual Factors Related to Area Differentials in Suicide." *Korean Journal of Health Education Promotions* 30(1):41-52.

Kim, Hyoung-Soo and Lee-Kyung Kwon. 2013. "Relationship between Elderly Suicide Rates and Socio-Economic Factors in Korea: Centering around the Trend of Changes in 1990-2010." *The Journal of the Korea Contents Association* 13(6):236-45. doi: 10.5392/jkca.2013.13.06.236.

Kim, Ki-Won and Han-Gon Kim. 2011. "Macro Analysis of Factors Impacting on the Elderly's Suicide Rates in the Republic of Korea." *Korean Journal of Population Studies* 34(3):31-54.

Kim, Wang-bae. 2010. "Suicide and the Breakdown of Society." *Korean Studies Quarterly* 33(2):195-224.

KOSSDA. 2013. *Regional Statistics of South Korea 2005-2010*. Seoul: Korea Social Science Data Archive.

Mishara, Brian L. 1995. *Beyond Suicide: The Impact on Family and Friends, Helpers, Indiivduals and Society*, Edited by B. L. Mishara. New York: Springer.

NSO. 2013. *Mortality Statistics of South Korea*: National Statistics Office.

OECD. 2013. *Oecd Factbook*: OECD.

Phillips, David P. 1974. "The Influence of Suggestion on Suicide: Substantive and Theoretical Implications of the Werther Effect." *American Sociological Review* 39(3):340-54. doi: 10.2307/2094294.

Ryu, Jung-Kyun 2008. "Regional Differntials in Elderly Suicide Rate: The Focusing on Effects on Family Instability, 1995-2005. ." *Korean Journal of Population Studies* 31(2):21-44.

Shin, Dong-Jun. 2007. "Suicide - Social Pathology of Disarrangement." *Hwanghae Review*:98-124.

Song, Tae-Min, Jin-Dal-lae, Ju-Young Song, Ji-Young An and Young-Ja Cho. 2013. "A Comparative Analysis of Suicide Characteristics by Age Group in Korea." *Journal of The Korea Society of Health Informatics and Statistics* 38(1):122-42.

Wu, Fei. 2010. *Suicide and Justice: A Chinese Perspective*: Routledge.