Group Name: DDS: Dust of Data Science.

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Group Project Part 2: Group Project Question Description

Recently in Korea, there has been a rise of issue regarding the rising level of fine dusts. According to The Korea Herald, they say that at least 1 in 6 dies early from fine dust in Korea. We examine the seriousness of this rising problem and would like to conduct a study regarding this issue. Some say that the cause of such phenomenon is due to the influence of China, and others say that it is from the increase in the coal usage. There are many rising debates regarding this issue and our group intends to get on this underlying cause using the sets of data we have found. Our main set of data comprises of㎍/㎥ of fine dust level in Korea from 2010 to 2014 found from KOSIS, Korean Statistical Information Service. With that data as our benchmark, we would like to relate different suspects of factors such as the level of coal production and sales from 1995 to 2013 in Korea, Co2 emission level from automatic vehicles from 1996 to 2012 in Korea, ratio of registered vehicles to population from 2003 to 2014 in Korea, number of registered driver’s license holders from 1962 to 2014 in Korea, number of bicycle facilities from 2011 to 2013 in Korea, levels of spending in transportation fees per homes from 2005 to 2014 in Korea, and lastly, number of visits in hospitals of doctor’s offices from 2009 to 2013 in Korea. *From these data sets we have found, we would like to see what factors are the most relevant to this phenomenon and infer what potential actions the government should implement to qualify the effects of rising level of fine dusts in Korea.*

We are going to try and answer our question by first looking into the various data regarding the potential factors that might affect the levels of fine dust level in Korea. We intend to gather the various data and conduct a regression test, and a t-test to find out the correlations to test our internal and external validities. After looking into the R values and the P-values of each potential factors, we would like to compile a simple graph showing the diverse effects of the potential factors and examine which potential factor has the highest correlation with the fine dust level across the time period of 2011 to 2013 in Korea.

Our potential limitations for our study are that although we would like to control for all of the other unthought-of factors, we might simply miss them. In coming up with our factors, most of them were from our common hearings and from the news articles regarding the issue. Another potential limitation is that we might not have sufficient data of the factors with identical time interval; for instance, one data is given in months and others might be given in years. We would try to minimize this drawback by summing up the months or weeks into a yearly unit and try to unify our measures as much as possible. Lastly, although we may infer correlations, we may not be able to infer causation in that testing for causation would involve another structure of study and we hope it be studied in the future.

Studies have been conducted previously regarding the fine dusts. In 1996, Tong and his colleagues conducted a study exploring the effect of Asian dusts events on daily mortality in Seoul during the period of 1995-1998. Their study provided with weak association between the Asian dusts events and risk of death from all causes. In regards to this previous study, we would like to get at the 2011-2013 time frame, when the similar issue with the fine dusts in Korea was prominent.

In 2015, professors from Inha University and Ajou University have looked into the fine dust levels in regards to the death rates in Korea. They were able to find that air pollution caused 15.9% of total mortality per year in Seoul, Korea. They also took to look into what symptoms increased over the course of the higher fine dust level. Their marquee finding was that in every six people in Seoul, one would die early due to the effects of fine dusts. The study was crucial in that it looked into the effects of the fine dusts to the Korean society. In contrast to this study, our team would like to compare diverse potential factors of causes of fine dusts in regards to its statistical feasibility. After such remarkable finding by the scholars, our team would like to consider the various causes of fine dusts and develop a simple plan to warn what factors to keep in mind and evade if possible.

Works Cited

Ning, Da-Tong. Zhong, Liang-Xi. Chung, Yong-Seung. (1996), Aerosol size distribution and elemental composition in urban areas of Northern China. *Atmospheric Environment*, Vol 30, Issue 13, pp. 2355-2362.

Leem, Jong Han. Kim, Soon Tae. Kim, Hwan Cheol. (2015), Public-health impact of outdoor air pollution for 2nd air pollution management policy in Seoul metropolitan area, Korea. *Annals of Occupational and Environmental Medicine,* 2015, 27:7.

Lee, Hyun-jeong. (2015), At least 1 in 6 dies early from fine dust: study. *The Korean Herald*. <http://www.koreaherald.com/view.php?ud=20150420001188>.