# Economic and Environmental Determinants of the Health Condition of the Filipinos

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## Abstract

Economic development has always been the target of economic policies because higher output brings about improvement in welfare in terms of the country's ability to provide the necessary social services. But when development efforts are aggressively pursued to the extent of causing environmental degradation and natural resource depletion, this would also cause adverse effects to human welfare in terms of health. With this two opposing forces, this research endeavors to establish the groundwork that would identify the effect of economic development and environmental factors on the health condition of Filipinos. The growing awareness of looking after the health welfare and good quality of life for the Filipinos, and the realization that environmental protection is a requisite for good health, the findings of this study can provide insights to policymakers and a groundwork for the review and formulation of development policies and programs to ensure sustainable development by putting environmental issues at the heart of economic policies.

Using data for the Philippines from 1980 to 2004, health indicators like crude death rate, infant mortality rate, maternal mortality rate and life-expectancy at birth were analyzed with economic indicators such as GNP per capita, level of industrialization and Government health expenditure per capita; and environmental indicators such as Carbon-Dioxide emission,

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Particulate Matter on air and Bio-Oxygen Demand.

Over the 25-year period, an improvement in all of the four health indicators is observed. Among the factors identified, Carbon-Dioxide Emission strongly and significantly explains the variation in the three (3) health indicators used namely: Crude Death Rate, Infant Mortality Rate and Life Expectancy at birth. Crude Death Rate in particular can be explained by both economic and environmental indicators but none of the factors could explain the overtime variation in maternal mortality rate of the Philippines.

*Keywords*: Crude Death Rate, infant mortality rate, maternal mortality rate, life-expectancy at birth, PM10, Carbon- Dioxide, Bio-Oxygen Demand

## Introduction

Economic development is pursued by a country because it brings about progress, higher income and employment. Higher income in turn will lead to the betterment and general well-being of the people.

Economic development is readily associated with industrialization, wherein a bigger share of the economic output comes from the manufacturing and service sectors. However, more often than not, there is always a price that must be paid for economic development and in most cases, the price is in terms of the cost to the environment and natural resources. Traffic congestions, vehicular and industrial emissions among others, are byproducts of development which also pose extreme hazards to the health and well-being of the populace. If these adverse effects of development are not abated, they could compromise and jeopardize the quality of life of the people in terms of poor health condition.

Environmental degradation could detract the pace of economic development by imposing high cost to developing countries like the Philippines through health-related expenses and reduction in the productivity of both human and non-human resources. This study could shed light on whether economic factors like Real Gross Domestic Product, Level of industrialization and Per capita Government Expenditure on Health can have effects on the health condition of Filipinos. Moreover, this study also attempts to identify the effect of environmental factors like air and water pollution on the people's health condition.

In this study, Level of Industrialization is measured in terms of the output share of the industry sector to the Gross National Product of the Philippines. Air pollution is measured in terms of Carbon Dioxide ($CO_2$) emission and Particulate Matter on Air (PM10). Particulate matters on air are too fine suspended particulates less than 10 microns in diameter, which are capable of penetrating deep into the respiratory tract. Water pollution on the other hand, is measured in terms of Bio Oxygen Demand (BOD).

Health condition is measured using four indicators namely: Crude Death Rate, Infant Mortality Rate, Maternal Mortality Rate and Life-expectancy at Birth.

Because of the growing awareness of looking after the health welfare and good quality of life for the Filipinos, and the realization that environmental protection is a requisite for good health, the findings of this study can provide insights to policymakers and a groundwork for the review and formulation of development policies and programs to ensure sustainable development by putting environmental issues at the heart of economic policies. To the Department of Health, this study provides predictive significance in terms of instituting programs to improve the health condition of the people, taking into consideration the variation overtime in the economic and environmental indicators. Concerned agencies can therefore evaluate their existing budget and programs.

In order to establish a possible causal relationship between the economic and environmental indicators with the health condition indicators, as measured by four variables, namely crude death rate, maternal mortality rate, infant mortality rate and life expectancy at birth is shown in a schematic diagram, are used.

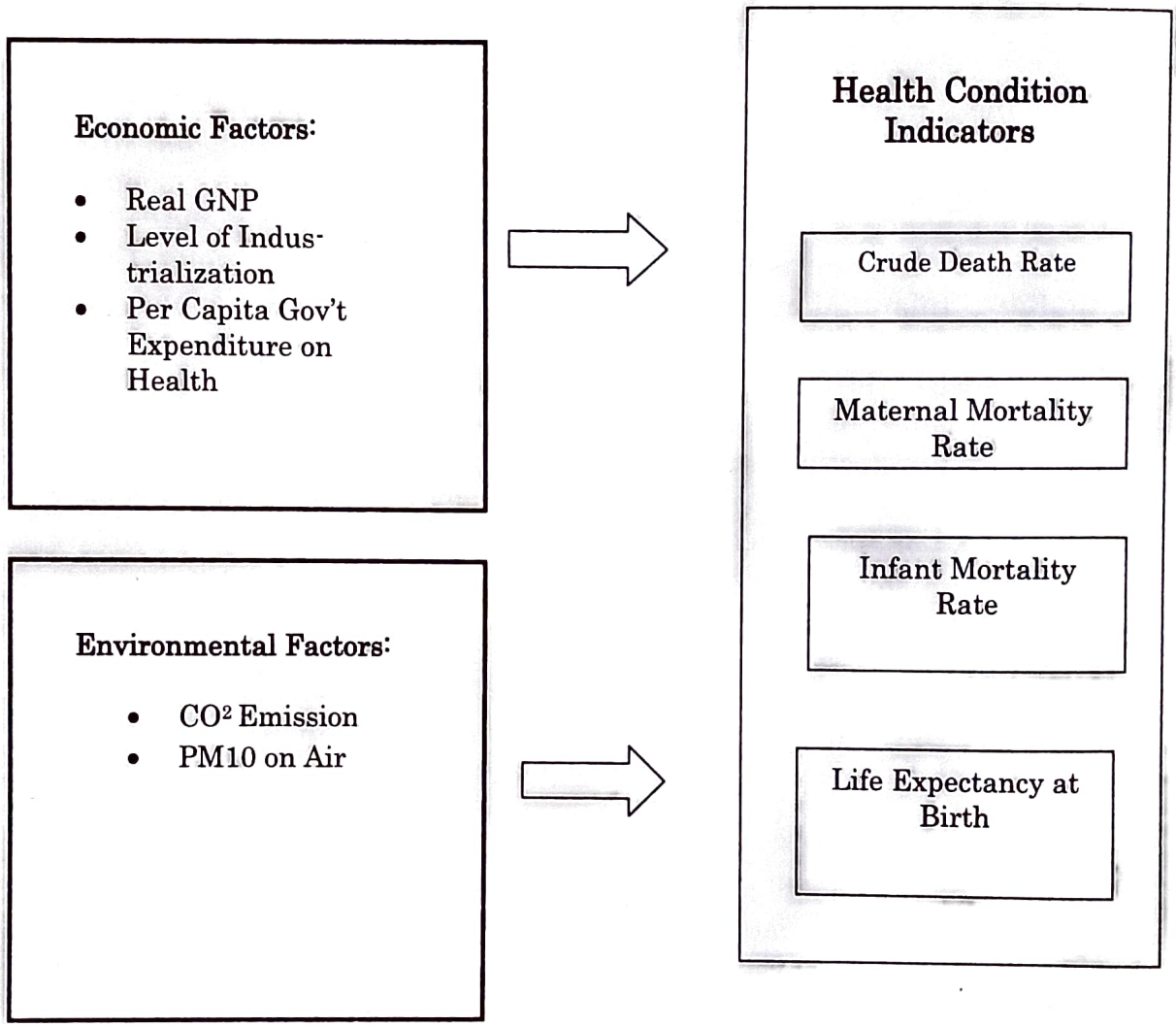


**Figure 1.** Conceptual Framework

Figure 1 presents four conceptual models used in the study. Using data for the Philippines from 1980 to 2004, each of the health condition indicators are analyzed using the economic and environmental factors as determinants.

## Presentation, Interpretation and Analysis of Data

### I. Health Status of Filipinos (1980 – 2004)

Figure 2 is a graphical presentation of the trend of the Crude Death Rate per thousand population, Infant Mortality Rate per thousand live births, and Maternal Mortality Rate per thousand live births of the Philippines from 1981 – 2004. Crude Death Rate in 1980 registered 8.3 deaths per thousand population, is generally falling overtime reaching as low as 4.02 deaths per thousand population in 2004, except for a sudden increase in the year 1996 when it reached as high as 214.09 and then falling back to its normal trend at 4.74 in 1997. Infant Mortality Rate was previously very high at 63.2 infant deaths per thousand live births in 1980, generally falling overtime and reaching as low as 10.25 infant deaths per thousand live births in 2004. Minor fluctuations however are registered in between the 25 year period. Maternal Mortality Rate is constantly low over the 25 year period and is still on a declining trend. This trends could be due to the effective maternal health program of the DOH.

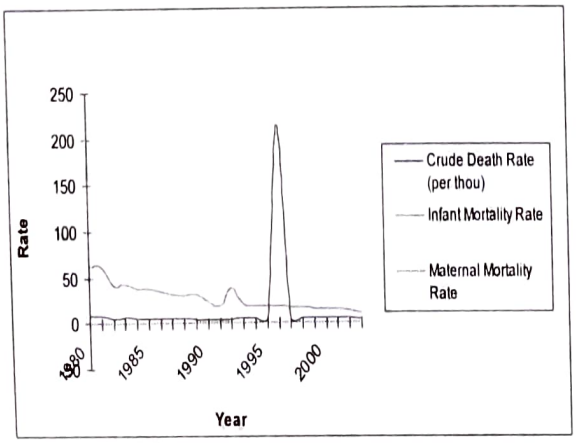


**Figure 2.** Crude Death Rate, Infant Mortality Rate & Maternal Mortality Rate

Figure 3 shows the Life Expectancy at Birth of the Philippines. Health condition of the Filipinos measured in terms of Life Expectancy shows a significant improvement from the 1981 level. A newborn in 1980

was expected to live for only 61.6 years while a newborn in 2004 will live for approximately 69.86 years.

On the basis of the above health indicators, there is clear evidence of a significant improvement in the health status or condition of Filipinos within the period covered in this study. Death and mortality rates are declining while life expectancy at birth is increasing overtime.

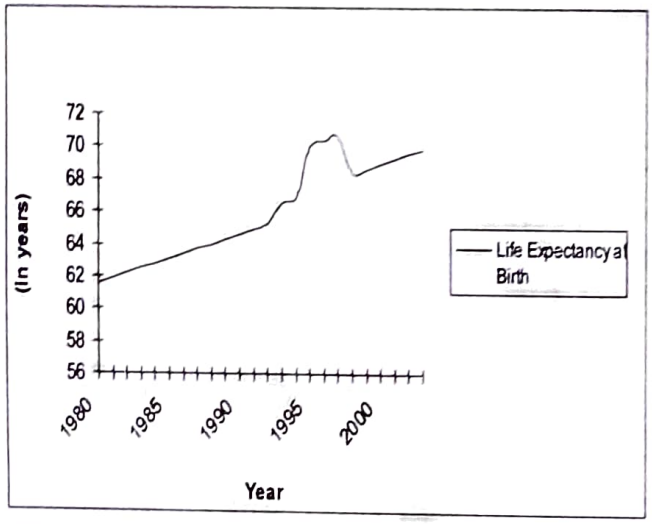


**Figure 3.** Life Expectancy at Birth

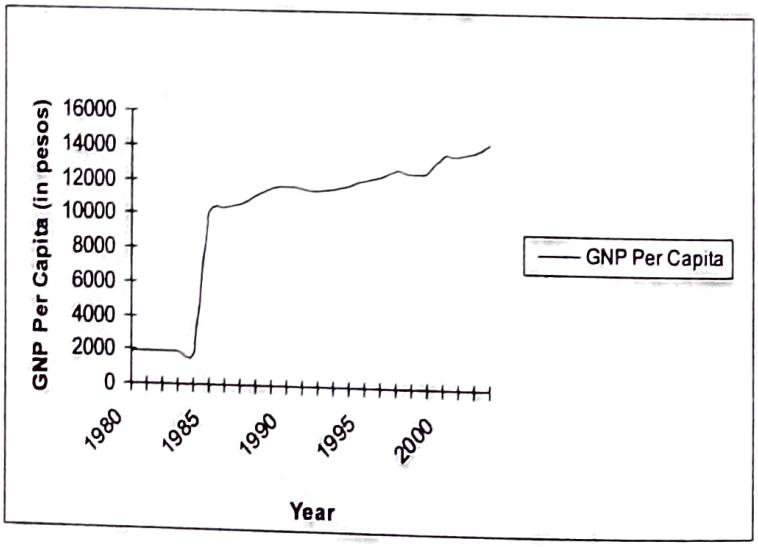


**Figure 4.** GNP Per Capita

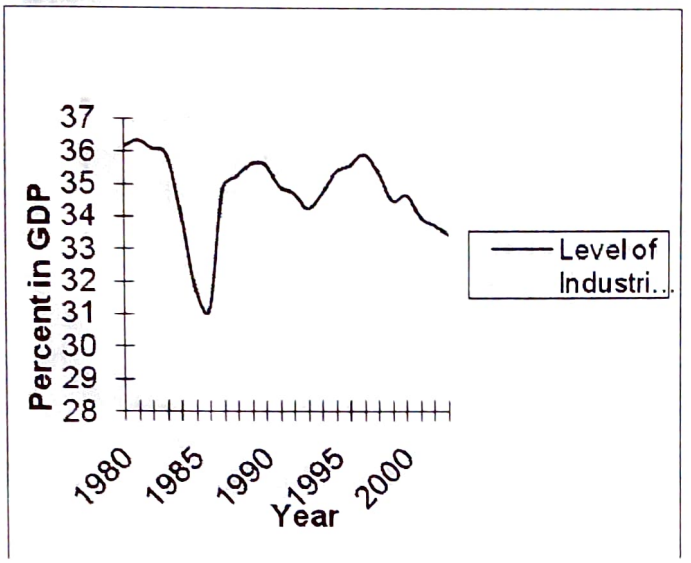


**Figure 5.** Level of Industrialization

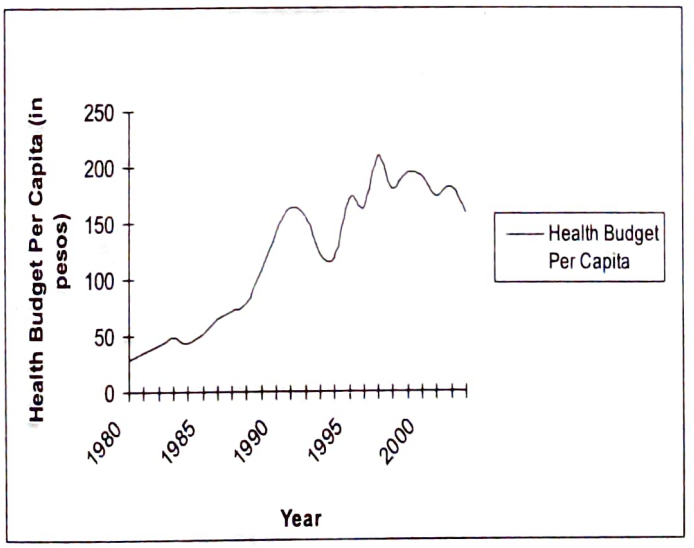


**Figure 6.** Government Health Budget Per Capita

Figures 4, 5, and 6 present the economic condition of the Philippines from the year 1980 to 2004 using real GNP per capita, Level of Industrialization and Government Health Budget per capita respectively. Economic output per person was declining from 1982 to 1984. A significant increase can be observed in 1985 and constantly increasing thereafter. This trend indicates that while the population is growing overtime, output is increasing more than the growth in population. This implies that the economy has increased its capacity to provide for the needs of the fast-growing population of the country. On the other hand, the share of industry to economic output is declining from 36.11 percent in 1980 down to 33.46 percent in 2004. This does not mean however that the Philippines is not pursuing industrialization. It however implies that industrialization can only be sustained if both the agricultural base and the service sector are also strengthened.

Government health budget per capita is also generally increasing overtime. There are, however, periodic fluctuations, reflective of the changes in annual budgetary priorities of the government.

## III. Environmental Indicators (1980 – 2003)

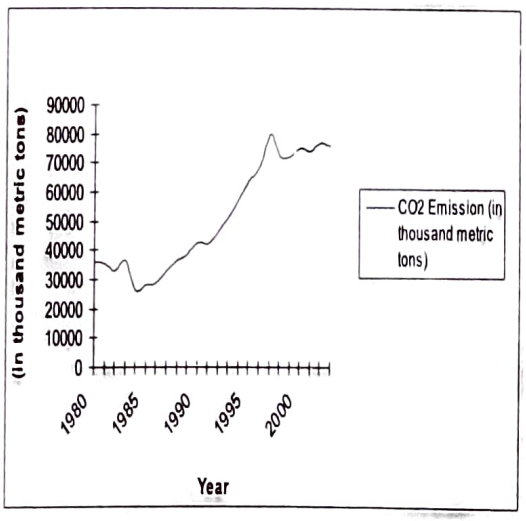


**Figure 7.** Carbon Dioxide (in thousand metric tons)

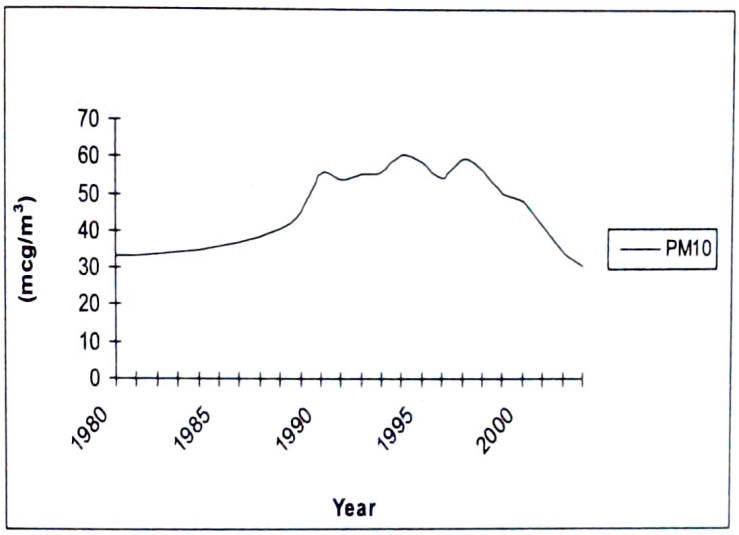


**Figure 8.** PM10 (mcg/m$^3$)

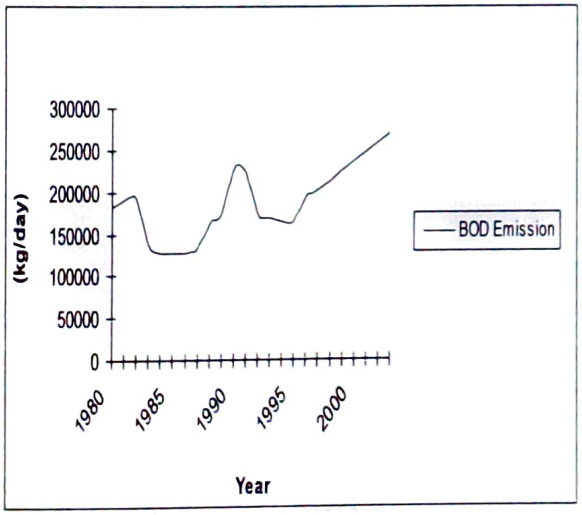


**Figure 9.** BOD Emission (kg/day)

Figures 7, 8, and 9 show the trend in environmental condition from 1980 to 2003 in terms of the level of Carbon Dioxide Emission in thousand metric tons, Particulate Matter on Air (PM10) in mcg per cubic meter both measuring air pollution and BioOxygen Demand as a measure of water pollution, respectively. It is clearly noted in the

graph that Carbon Dioxide emission is increasing overtime, indicating that air pollution is getting critical. This can be a result of industrialization and urbanization activities which greatly affected the environment. Sharp increase can be seen from the mid '80s to 1997. The trend began to tone down thereafter maybe because of the growing concern for the environment and the implementation of the Clean Air Act. PM10 trend shows more or less a similar pattern as that of $CO_2$ emission although it is already decreasing since late 90's.

Water pollution was falling before 1995 and began to increase in the late 80's reaching high level in the early 90's. It was again decreasing in 1992 and started to increase in 1995 and thereafter. From then on, water pollution in terms of BioOxygen Demand is increasing much faster than ever.

**Table 1.** Five- Year Average of Leading Causes of Registered Death: 1980-2004

| Year | Causes of Death | Average no. of deaths | % of Total | Rank |
|---|---|---|---|---|
| 1980-84 | Pneumonia | 45673 | 0.31 | 1 |
| | Diseases of the Heart | 32767 | 0.22 | 2 |
| | Tuberculosis | 28095 | 0.19 | 3 |
| | Diseases of the Vascular System | 23772 | 0.16 | 4 |
| | Malignant Neoplasms | 16544 | 0.11 | 5 |
| | Total | 146851 | | |
| | | | | |
| 1985-89 | Pneumonia | 49984 | 0.30 | 1 |
| | Diseases of the Heart | 39931 | 0.24 | 2 |
| | Tuberculosis | 28854 | 0.17 | 3 |
| | Diseases of the Vascular System | 28927 | 0.17 | 3 |
| | Malignant Neoplasms | 19571 | 0.12 | 4 |
| | Total | 167267 | | |
| | | | | |

| | | | | |
|---|---|---|---|---|
| 1990-94 | Pneumonia | 36746 | 0.22 | 2 |
| | Diseases of the Heart | 48113 | 0.29 | 1 |
| | Tuberculosis | 24470 | 0.15 | 4 |
| | Diseases of the Vascular System | 32511 | 0.20 | 3 |
| | Malignant Neoplasms | 24264 | 0.15 | 4 |
| | Total | 166105 | | |
| | | | | |
| 1995-99 | Pneumonia | 32872 | 0.19 | 2 |
| | Diseases of the Heart | 54309 | 0.31 | 1 |
| | Tuberculosis | 26892 | 0.15 | 4 |
| | Diseases of the Vascular System | 33293 | 0.19 | 2 |
| | Malignant Neoplasms | 30048 | 0.17 | 3 |
| | Total | 177414 | | |
| | | | | |
| 2000-04 | Pneumonia | 32989 | 0.16 | 4 |
| | Diseases of the Heart | 66442 | 0.33 | 1 |
| | Tuberculosis | 27171 | 0.13 | 5 |
| | Diseases of the Vascular System | 36845 | 0.18 | 2 |
| | Malignant Neoplasms | 38578 | 0.19 | 3 |
| | Total | 202025 | | |

Table 1 presents the top five leading causes of registered death on a five year average. It can be seen that among the five, pneumonia is the predominant cause in the 80's (1st) and 90's (2nd). Pneumonia is an infection of one or both lungs which is usually caused by bacteria, virus of fungi. It is contracted by breathing in small droplets that contain the organisms that can cause pneumonia. (www.medicine net.com/pneumonia/article.htm).

Among the five leading causes of death, it is pneumonia which is most likely to be associated to air pollution. The symptoms of

pneumonia are coughs, bronchitis and chronic phlegm. Other leading causes of death are not airborne.

According to WB, around 80% of air pollution is generated by motor vehicles and has been blamed for the surging incidence of asthma, chronic bronchitis and pneumonia, topping the list along with other ailments such as heart problems, cancer, tuberculosis and others that damage the central nervous system. (World Bank Phil. Environment Monitor 2002)

**Table 2.** Result of Regression of Crude Death Rate against Economic and Environmental Indicators, Philippines, 1980 – 2004

| Variables | Regression Coefficient | t-value | P>/ t / |
|---|---|---|---|
| GNP | -0.0000782 | -1.47 (0.0000532) | 0.16 |
| GHE* | -0.0203796 | -3.92 (0.0052001) | 0.001 |
| LOI* | -0.3213001 | -2.76 (0.1165327) | 0.013 |
| BOD | 9.02e-06 | 1.67 (5.42e-06) | 0.114 |
| $CO_2$* | 0.0000643 | 6.12 (0.0000105) | 0.0000 |
| PM10* | 0.0401025 | 2.21 (0.0181075) | 0.041 |
| Constant | 12.24923 | 3.37 (3.638331) | 0.004 |

*The variable is significant at 5 % level.

Table 2 presents the regression result for the Crude Death Rate model. Of the six factors considered, four turned out to be significant determinants of Crude Death Rate. These are the Per Capita Government Health Expenditure, Level of Industrialization, $CO_2$ emission and PM10. The respective t-values indicate that the coefficients of these variables are significantly different from zero.

The coefficient of determination r-squared however, shows that 55 percent of the variation in the crude death rate overtime can be explained by the above model. Furthermore, the sign of the regression coefficients of the economic and environmental determinants are consistent with the expected relationship of these variables to the crude death rate. Table presents the annual rate of change of crude death rate relative to Carbon Dioxide Emission ($CO_2$), PM10, Level of Industrialization and Government Health Expenditure on Health per capita Philippines 1980-2004. The regression coefficient for per capita government health expenditure of **0.0203796** indicates that if government expenditure will increase by **P100** per capita, crude death rate will decrease by **2.04** per thousand population, other factors constant. The level of industrialization coefficient of **-0.3213001** implies that if the share of industry sector to Gross National Product of the Philippines will increase by **10%,** other factors given, crude death rate will decline by **3.2** per thousand population. The regression coefficient of carbon dioxide emission is **0.0000643.** This indicates that if $CO_2$ emission will increase by **a hundred million metric tons per year**, crude death rate will increase by **6.4 per thousand population**, other factors constant. Particulate Matter 10 regression coefficient of **0.0401025** indicates that if the density of PM10 on air increases by **100mcg per cubic meter**, crude death rate will increase by **4 per thousand population**, other factors given.

Specifically, it can be inferred that the higher per capita expenditure for health, the lower is the crude rate. Government expenditure on health has a direct relevance to the health care sector, where policies and programs generally address specific diseases or injuries attributable to environmental factors in terms of DALYS or disability adjusted life years which is the weighted measure of death, illness and disability (WHO Report 2004). Moreover, it can be expected that as a country grows and develops, the quality of life of the population improves not only economically in terms of material

possessions but also in terms of healthy lifestyle years. In a study of Friedman et. al. 2005, on industrialization and infant mortality, manufacturing employment raised living standards, housing quality and reduced cooking with wood and coal which helped reduced infant mortality (Friedman et. al., Maya et. al, Levine, David I., 3-20-2005) (www.scholarship.org.ucitem).

The result also underscored that the more serious air pollution problems is in terms of the emission of carbon dioxide and in terms of the particulate matter, other factors given, the more air pollution, the higher will be the country's crude death rate. World Bank's Philippine Environment Monitor 2002 revealed that as many as 9000 Filipinos in urban areas suffer from chronic bronchitis. Manila's skies are among the most polluted in the world, citing diesel emissions from public transport vehicles as the major source of air pollution. Reports showed that 6000 tons of particulates, chemicals and other pollutants are emitted daily by 2 to 3 million vehicles daily. Vehicle densities have surged from 675,310 in 1990 to 1.2 million in 2001 at an accelerating growth. There is a direct correlation between number of cars and the amount of pollution in the air. The loss of lives to filthy air is not the only price paid by the public.

Crude death rate is also significantly affected by particulate matter as evidenced by the regression result. Excessive urban particulate matter (PM10) levels are responsible for 300,000 to 700,000 premature deaths annually and for half of childhood coughing, while 400 to 700 million people mainly women and children in poor rural areas are affected by smoky indoor air. (WHO Report Preventing Disease Through Healthy Environment, Pruss-Ostun C. Corvalan). The epidemiological studies in Manila and ambient monitoring of air pollutants, have shown that particulate matter (PM10) poses the most serious threat to public health over other air pollutants (SO2, NO2, CO and 03) www.world bank.org. The WB report unraveled that the total cost of exposure to particulate matter (PM10) in Metro Manila and other urban areas comes to a whopping $430 million (P22.8 billion). Many acute and chronic health impacts is attributable to environmental risk factors such as exposure to dust, chemicals, as well as indoor air pollution from household solid fuel use. Other forms of indoor and outdoor air pollution – ranging from transport to second hands tobacco smoke – also play a role. In

developed countries, 20% are caused by lower respiratory infections while 42% in developing countries are associated to household solid fuel use and to second-hand tobacco smoke as well as outdoor air pollution. (WHO 2006)

Poor air quality kills about 5000 people in Metro Manila every year (WB and DENR Report) this corroborates a World Health Organization report which claims that air in Metro Manila is the fourth most polluted worldwide next to Mexico, Shanghai, and New Delhi. (From the report of Dr. James Bernard Simpas during the Pacific Paint Phil. Event)

For developing countries, 25% of deaths were attributable to environmental factors and only 17% in developed countries. Moreover, an estimated 42% of chronic obstructive pulmonary diseases (COPD) a gradual loss of lung function, due to exposures to dust and chemicals have been reported.

Around 80% of air pollution is generated by motor vehicles. Air pollution has been blamed for the increase in the incidence of bronchitis among children in Metro Manila is 11 times the national average. Moreover, the incidence of chronic cough, chronic phlegm, wheezing and shortness of breath are highest among jeepney and bus drivers as well as commuters. Aside from serious threats to health, it also means billions of pesos wasted in lost productivity, hospitalization, and medication, as well as possible revenue loss from tourism. Henrylito Tacio (WB and DENR Report) further indicated in his paper that the cost of air pollution to the country is $1.5 billion per year or about 2% of GDP. He figured the cost in terms of lost wages, medical treatment expenses and premature loss of life due to air pollution.

The presence of water pollution (BOD) in the country over the years may have influenced crude death rate but the effect is not statistically significant.

Table 3. Infant Mortality Rate = f (Real GNP, Government Expenditure on Health, Industrialization Index, Carbon Dioxide Emission, Particulate Matter, Bio Oxygen Demand)

| Variables | Regression Coefficient | t-value | P>/ t / |
|---|---|---|---|
| GNP | 0.0000125 | 0.79 (0.0000159) | 0.443 |
| GHE* | -0.0038696 | -2.49 (0.0015521) | 0.023 |
| LOI | 0.0088582 | 0.27 (0.0325048) | 0.789 |
| BOD | -8.94e-07 | -0.6 (1.49e-06) | 0.558 |
| CO2* | 8.29e-06 | 2.3 (3.60e-06) | 0.034 |
| PM10 | -0.0036882 | -0.71 (0.0051825) | 0.486 |
| Constant | 0.9437644 | 0.94 (0.9995354) | 0.358 |

* the variable is significant at 5 percent level of significance.

R-squared: 0.1315

Infant Mortality Rate of the Philippines from 1980 – 2004 was regressed against the economic and environmental determinants. The estimated model for Infant Mortality Rate is as follows:

IMR = 0.9437644 + 0.0000125GNP – 0.0038696GHE + 0.0088582LOI – 8.94e-07BOD + 8.29e-06CO2 – 0.0036882PM10

The coefficient of determination though is a meager 0.1315 indicating that only 13.15 percent of the variation in infant mortality rate overtime can be explained by the above model. It can be inferred from the foregoing results that of the six determinants considered, only two (2) turned out to be significant namely: Per Capita Government Expenditure on Health and Carbon Dioxide Emission. The coefficient further shows that **if the government spends an additional P1000 per capita on health programs, infant mortality rate will decline by approximately 4 infant deaths per thousand live births.** This implies

further that government can achieve lower death rate among infants if it increases the budget on health programs for infants. Moreover, as **carbon dioxide emission increases by as million metric tons per year, infant mortality rate will increase by approximately 8 infant deaths per thousand live births,** other factors given.

These findings imply that carbon dioxide emission is causing deaths among infants. This is strongly supported by the fact that globally according to WHO 2006, it is estimated that the disease burden (healthy life years) is 24% and 23% of pre-mature mortality was attributable to environmental factors. It is higher among children (0-14 years old) at 36%. In developing countries, 25% among children and 17% for developed countries. Moreover, an estimated 42% of chronic obstructive pulmonary disease (COPD), a gradual loss of lung function, is due to exposures to dust and chemicals.

**Table 4.** Life Expectancy at Birth = f (Real GNP, Government Expenditure on Health, Industrialization Index, Carbon Dioxide Emission, Particulate Matter, Bio Oxygen Demand)

| Variables | Regression Coefficient | t-value | P>/ t / |
|---|---|---|---|
| GNP* | 0.0001581 | 2.04 (0.0000776) | 0.058 |
| GHE | 0.0020366 | 0.23 (0.0087783) | 0.819 |
| LOI | -0.0568379 | -0.39 (0.1458645) | 0.702 |
| BOD | -7.81e-06 | -0.98 (7.95e-06) | 0.339 |
| $CO_2$* | 0.0001194 | 5.81 (0.0000205) | 0.000 |
| PM10 | -0.0133963 | -0.47 (0.0284542) | 0.644 |
| Constant | 61.92722 | 13.42 (4.615363) | 0.000 |

* the variable is significant at 5 percent level of significance.

R-squared: 0.8403

From the above regression result, the estimated model is

$$LEB = 61.92722 + 0.0001581GNP + 0.0020366GHE - 0.0568379LOI - 7.81e \cdot 06BOD + 0.0001194CO_2 - 0.0133963PM10$$

The above result indicates that only Carbon Dioxide Emission and significantly explains the variation in the Philippines life expectancy at birth, in both sexes. It implies that carbon dioxide emission has shortened the life expectancy of the people. An increase by ten thousand metric tons of $CO_2$ per year, life expectancy at birth will decrease by 1.2 years other factors constant. Other indicators may probably have affected life expectancy at birth overtime but their effects maybe so small and are of no statistical significance.

The coefficient of determination of 0.8403 indicates that the model has a very good fit, explaining 84.03 percent of the variation in the life expectancy at birth overtime.

**Table 5.** Maternal Mortality Rate = f (Real GNP, Government Expenditure on Health, Industrialization Index, Carbon Dioxide Emission, Particulate Matter, Bio Oxygen Demand)

| Variables | Regression Coefficient | t-value | P>/ t / |
|---|---|---|---|
| GNP | -0.0004411 | -0.54 (0.0008126) | 0.594 |
| GHE | -0.1540746 | -1.84 (0.0836181) | 0.083 |
| LOI | -0.5230658 | -0.37 (1.421687) | 0.717 |
| BOD | 0.0000655 | 0.92 (0.0000714) | 0.372 |
| $CO_2$ | 0.0001395 | 0.71 (0.0001954) | 0.485 |
| PM10 | 0.349968 | 1.51 (0.23169) | 0.149 |
| Constant | 28.26281 | 0.6 (47.39284) | 0.559 |

R-squared: 0.6976

From the above regression result, the estimated model is

$$MMR = 28.26281 - 0.0004411GNP - 0.1540746GHE - 0.5230658LOI + 0.0000655BOD + 0.0001395CO_2 + 0.349968PM10$$

The regression result for maternal mortality rate of the Philippines shows that none of the explanatory variables considered is statistically significant. The model therefore cannot explain the overtime variation of maternal mortality rate of the Philippines. The declining trend in the maternal mortality rate overtime may have

been due to the more effective health programs of the government and the increasing awareness among mothers on best health practices specifically during pregnancy.

**Table 6.** Summary of Result of 4 Regression Models

| | Economic | | | Environmental | | |
|---|---|---|---|---|---|---|
| **Health Indicators** | **GNP** | **LOI** | **GHE** | **$CO_2$** | **BOD** | **PM10** |
| Crude Death Rate | I | S | S | S | I | S |
| Infant Mortality Rate | I | I | S | S | I | I |
| Life Expectancy at Birth | I | I | I | S | I | I |
| Maternal Mortality Rate | I | I | I | I | I | I |

**I – Insignificant**
**S – Significant**

In all four regression results, GNP does not show significant effect on crude death rate. This means an increase in the country's production does not automatically imply improvement in people's well-being.

The presentation of the summary of the result of the 4 models of regression on Table 6, clearly shows, that only crude death rate exhibited the most number of variables with significant causal relationship. For infant mortality rate, it has significant relationship with 2 variables only namely, per capita health expenditure and carbon dioxide emission, while life expectancy at birth is only significantly related to carbon dioxide emission. All three models common explanatory variable is carbon dioxide emission. This implies that air pollution has the most significant influence on the health condition of individuals/population.

## Recommendations

The findings of the study are relevant to healthcare policy makers and practitioners, and the Department of Health in particular, to enable them to design more effective, health strategies that reduce corresponding risk to public health.

It is recommended that a review and assessment of the implementation of the Clean Air Act be made to measure the impact of such programs and policies.

Further study could be undertaken to focus on the establishment of linkages and quantify population risks (burden of disease) for various environmental factors.

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## Appendices

**Table 1.** Crude Death Rate, Carbon Dioxide Emission, PM10, Level of Industrialization And Government Expenditure on Health per capita, Philippines, 1980-2004

| Year | Crude Death Rate (per thou) | $CO_2$ Emission (in thousand metric tons) | PM10 (mcg/m3) | Level of Industria-lization | Per Capita Gov't Expen-diture on Health |
|---|---|---|---|---|---|
| 1980 | 6.94 | 33497.2 | | 35.72 | 39.39 |
| 1985 | 5.52 | 32986.8 | | 33.744 | 75.106 |
| 1990 | 4.192 | 47893 | 56.314 | 34.84 | 140.16 |
| 1995 | 4.661 | 71219.6 | 55.88 | 35.342 | 184.022 |
| 2000 | 4.6775 | 75418.5 | 38.585 | 33.9675 | 176.195 |

**Table 2.** Infant Mortality Rate, Carbon Dioxide Emission, and Government Health Expenditure per capita, Philippines 1980-2004

| Year | Infant Mortality Rate | $CO_2$ Emission | Government Expenditure on Health per capita |
|---|---|---|---|
| 1980 | 49.62 | 33497.2 | 39.39 |
| 1985 | 33.34 | 32986.8 | 75.106 |
| 1990 | 23.922 | 47893 | 140.16 |
| 1995 | 17.49 | 71219.6 | 184.022 |
| 2000 | 13.8675 | 75418.5 | 176.195 |