Investigation on the Mortality Inequality Across Countries

Are citizens in countries with high GDP per capita expected to live longer than those in countries with low GDP per capita? The main question that I am trying to answer is whether there exists a mortality inequality across countries with respect to the wealth of the country. In my explanation I will show life expectancy has increased over time, there is a mortality inequality across countries with different GDP per capita and there is not enough evidence to say the mortality inequality diminished over time across countries.

To determine if there was an increase in the life expectancy, I used a simple regression with the average life expectancy's in 1990 and the average life expectancies in 2015. The results from the regression are in table 1. As you can see in the graph 1, I used a dummy variable that took value 1 in 2015 and value 0 in 1990. The dummy variable allows you to separate the data from each year. The intercept of the graph is equal to the average life expectancy in 1990, so the average life expectancy in 1990 is 65.033836. The average life expectancy in 2015 is 6.7680286 years longer than in 1990 so the life expectancy in 2015 is 71.801858. We can accept these results to be true since the t-stat is positive and the p-value is equal to approximately zero, these values imply the results are statistically significant. Statistically significant implies results are unlikely due to chance and we can accept them. I have shown there is has been an increase in life expectancy between the years 1990 and 2015.

To show that there is a mortality inequality across countries with different GDPs, I completed two regressions, one comparing the inequality in 1990 and the other comparing inequality in 2015. The results of the first regression comparing the inequality in 1990 are in Table 2 and Table 3 represents 2015. In 1990 it is found that a 1% increase in GDP is associated with approximately a 0.05-year increase in life expectancy at birth on average. We can accept

these results since the p-value is 2.65E-37 or approximately zero implying statistically significant. In 2015 the results were also statistically significant as the p-value is approximately zero and it found for a 1% increase in GDP there is a 0.046 increase in life expectancy. Both years showed results indicating that there is mortality inequality across countries with different GDPs as countries with higher GDP have higher life expectancy.
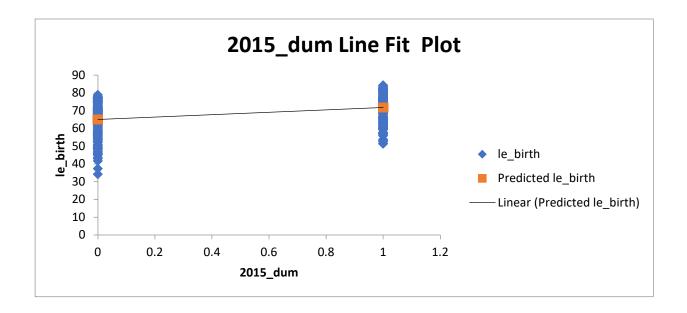
I found that there was not enough evidence to say the mortality inequality diminished over time across countries. To show that there was not enough evidence I completed a regression to see if the slopes in graph 2 have decreased between 1990 to 2015, which would imply a decrease in mortality inequality. In table 4 you can see the values of the multiple regression that was completed. The variable 2015xln_gdp has a coefficient value of -0.472 which represents the difference in slopes from 1990 to 2015 as seen in graph 2. In 2015 for a 1% increase in GDP per capita (USD) life expectancy increases by approx. 0.005 LESS years on average compared to 1990. Although we get a decreasing value, we can not accept these values as the p-value is approximately 0.2 and not statistically significant. What these values tell us is that there is too great of a probability that we got these results by chance and the slopes are not statistically different. I can not conclude that mortality inequality has decreased over time.

I have shown that there exists a mortality inequality across countries. There was an increase in life expectancy over the period of 1990-2015 but given the data I can not claim that the mortality inequality has decreased from 1990 to 2015 so there still exists a mortality inequality across countries.

Table 1

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 99.0%	Upper 99.0%
Intercept	65.033836	0.6791739	95.75432	3.5E-257	63.698164	66.36951	63.27503	66.79265
2015_dum	6.7680286	0.937349034	7.220393	3.13E-12	4.9246262	8.611431	4.34064	9.195418

Graph 1

2015_dum Line Fit Plot

Table 2 - 1990

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 99.0%	Upper 99.0%
Intercept	26.3152	2.379099	11.061	9.69E-22	21.61862	31.01178	20.11709	32.51331
ln_gdppc_usd_1999	5.111816	0.308125	16.59006	2.65E-37	4.503546	5.720085	4.309078	5.914553

Table 3 - 2015

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 99.0%	Upper 99.0%
Intercept	31.78074	1.908095	16.65574	8.66E-39	28.01658	35.5449	26.81516	36.74632
ln_gdppc_usd_2015	4.63982	0.218166	21.26737	8.38E-52	4.209437	5.070203	4.07207	5.20757

Table 4

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 99.0%	Upper 99.0%
Intercept	26.3152	2.054729	12.80714	3.8E-31	22.27427	30.35617	20.99409	31.63637
2015_dum	5.465541	3.079313	1.77492	0.07676	-0.59039	11.52147	-2.50899	13.44007
ln_gdppc_usd	5.111816	0.266115	19.2090	6.18E-57	4.588461	5.63517	4.422655	5.800976
2015xln_gdp	-0.472	0.37361	-1.26334	0.207294	-1.20676	0.262764	-1.43954	0.495546

Graph 2

Line of Best Fit 1990 and 2015