Analysis of Child Mortality on Geographical Basis Over Different Centuries

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Abstract
There are many variables involved in real life problem child mortality so it is difficult to choose an significant results out all of possible years relating to analytical factors. Child mortality rate is an issue specially in the developing and under developed countries. Because many children died due to different kind of diseases and unavailability of the health facilities, especially in under developed countries. The current research focus on the child mortality rate analysis. The analysis is carried out for the child mortality rate by the geographical analysis over time. The results shows that the highest mortality rate was found high in Angola 392.4367 and lowest was found in 187 United kingdom. The child mortality rate was found to be different through centuries and through year in two way analysis of variance test.

Keywords: Child Mortality Comparison, Geographical, Centuries, Analysis.

Introductions
Child mortality is the mortality of children under the age of five. The child mortality rate, also under-five mortality rate, refers to the probability of dying between birth and exactly five years of age expressed per 1,000 live births according to (Sullivan et al., 1994). They were aiming to reduce this problem as much as low 25 per live births under the 1000 live births. Rapid progress has been seen in many states. From 1990 to 2016, the child mortality rate fell down 12.6 million to 5.6 million children. About 80% of this occur in sub-Saharan Africa and South Asia.
and just 6 countries account for half of all under-5 deaths. China, India, Pakistan, Nigeria, Ethiopia, and Democratic Republic of Congo 45% of these children died during the first 26 days of life. Death rate were highest among children at age 1 by (You et al., 2015). There are different measurements for mortality rate are perinatal mortality rate, Neonatal mortality rate, Infancy mortality rate and Under 5 mortality rates. There are many reasons of child mortality rate some of them are as follows: Preterm birth complications, Pneumonia, Intrapartum-related events, Neonatal sepsis and Malnutrition is cause of by (Blencowe et al., 2016).

Due to child mortality rate a lot of fluctuations are wondering around the world. In less progress countries malnutrition is the main cause. Child mortality rate is not only by infection or disease it’s by other main reasons like, premature birth, malaria is cause of (Stephenson et al., 2000). Child mortality has fall from 9.6 million to 7.6 million. For a variety of reasons many mortality reports are not registered. Therefore, without accurate data mortality cannot fully discovered, the greatest risk to a child life by (O’Hare et al., 2013). The public health field concern to reduce child mortality which is belong to a field of child survival. To discover the most common cause of mortality child survival interventions are made which include pneumonia, malaria etc. An estimated 5.6 million children die each year mostly from such causes according to (Rutstein, 2000). The child survival strategies are in the line of fourth Millennium Development Goals (MDGs) which is focused on reducing child mortality 2/3 of children under five before the year 2015. In 2015, the MDGs were replaced with the Sustainable Development Goals (SDGs), which aim to end these deaths by 2030 by (Ruducha et al., 2017). In united-states most of the non-governmental organizations have been work with the core groups with coalition working through collaborative action, to save the lives of young children in the world's poorest countries. 1.7 Child mortality has been dropping as each country reaches a high stage of DTM. From 2000 to 2010, child mortality has dropped from 9.6 million to 7.6 million according to (Organization, 2012).

In order to reduce child mortality rates, there needs to be better education, higher standards of healthcare and more caution in childbearing. Child mortality could be reduced by attendance of professionals at birth and by breastfeeding and through access to clean water, sanitation, and immunization. In 2016, the world average was 41 (4.1%), down from 93 (9.3%) in 1990. This is equivalent to 5.6 million children less than five years old dying in 2016 by (Ahangari et al., 2016). There are different factors to reduce the child mortality rate in different countries. They are different solution that saves live to reduce child mortality, immediate and exclusive breastfeeding. Skilled attendants for antenatal, birth, and postnatal care. Access to nutrition and micronutrients. Family knowledge of danger signs in a child's health. Improved access to water, sanitation, and hygiene. Immunizations, Child mortality is not only caused by infection and disorder: it is also caused by premature birth; birth defect; new born infection; birth complication; and diseases like malaria, sepsis, and diarrhea is cause of (Adetoro, 2014).
The top global causes of death, in order of total number of lives lost, are associated with three broad topics: cardiovascular (ischemic heart disease, stroke), respiratory (chronic obstructive pulmonary disease, lower respiratory infections) and neonatal conditions – which include birth asphyxia and birth trauma according to (Lozano. et al,.2012). In the richest parts of the world deaths of children became very rare. The country with the lowest infant mortality rate today is Iceland at 0.16%. The chances of an infant surviving here are 170-times higher than in the past by (Roser et al,.2013).

**Methodology**

Descriptive statistics are brief descriptive coefficients that summarize a given data set, which can be either a representation of the entire or a sample of a population. Descriptive statistics are broken down into measures of central tendency and measures of variability (spread).

Ronald Fisher created the analysis of variance method. ANOVA is also called the Fisher analysis of variance, and it is the extension of the t- and z-tests. The term became well-known in 1925, after appearing in Fisher's book, "Statistical Methods for Research Workers.

The Formula for ANOVA is

\[ F = \frac{MST}{MSE} \]

where

\( F = \) ANOVA coefficient, \( MST = \) Mean sum of squares due to treatment, \( MSE = \) Mean sum of squares due to error.

**Two WAY ANOVA**

ANOVA (Analysis of Variance) is a statistical test used to analyze the difference between the means of more than two groups.

A two-way ANOVA is used to estimate how the mean of a quantitative variable changes according to the levels of two categorical variables. Use a two way ANOVA when you want to know how two independent variables, in combination, affect a dependent variable.

A two-way ANOVA when you have collected data on a quantitative dependent variable at multiple levels of two categorical independent variables.

A quantitative variable represents amounts or counts of things. It can be divided to find a group mean.

A categorical variable represents types or categories of things. A level is an individual category within the categorical variable.
Observations in your data set to be able to find the mean of the quantitative dependent variable at each combination of levels of the independent variables.

Both of your independent variables should be categorical. If one of your independent variables is categorical and one is quantitative, use an ANCOVA instead.

ANOVA tests for significance using the F-test for statistical significance. The F-test is a GroupWise comparison test, which means it compares the variance in each group mean to the overall variance in the dependent variable.

**Empirical Findings and Data Analysis**

The dataset is taken from secondary sources. Internet resources are used for this purpose. The dataset consisted of the child mortality rate of different countries. It was taken for the centuries of 1800, 1900 and 2000. The data is observed on the average of the child mortality rate of about 71 countries. The 71 countries data is used for analysis purposes. The reason behind the dataset is to measure child mortality rate.

To achieve the objectives of the research, descriptive analysis is carried out in terms of the minimum and maximum child mortality rate of different countries. The child mortality rate was high in Angola 392.4367 and low in 187 United Kingdom.

**Table 1:** ANOVA for the significant difference of child mortality

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P-value</th>
<th>F-crit.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Countries</td>
<td>660444.5</td>
<td>70</td>
<td>9434.922</td>
<td>3.637013</td>
<td>0.0000</td>
<td>1.392512</td>
</tr>
<tr>
<td>Centuries</td>
<td>5623607</td>
<td>2</td>
<td>2811804</td>
<td>1083.906</td>
<td>0.0000</td>
<td>3.06076</td>
</tr>
<tr>
<td>Error</td>
<td>363179.6</td>
<td>140</td>
<td>2594.14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>6647231</td>
<td>212</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From Table 1, it is observed that the child mortality is different in countries as well as by the years. As the p-values for the both factors are less than 0.05 and almost near to zero. It means that the child mortality is highly significantly different in both terms. Thus the overall, model is also significant in the analysis.

**Graphical Analysis**

The child mortality is also observed in term of graphical analysis and the results are noted in term of Figure.
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**Figure 1**: Child Mortality Rate for Century 1800

**Figure 2**: Child Mortality Rate for Century 1900

**Figure 3**: Child Mortality Rate for Century 2000
From Figure 1, 2, and 3, it is noted that the child mortality was very much high in 1800 century. While in 1900 century, it was low as compared to the 1800. For the 2000 century, it was very much lower than the previous two centuries. It means that as time passed by, there is decreased found in the child mortality rate. If the graph is analyzed according to the countries, then the significant difference is found between countries child mortality rate. The same results provided by the TWO WAY ANOVA.

It may be because the medical facilities are now more than the previous time. Thus the children can have definitely more life time as compare to the previous centuries. Many treatments have discovered for the child health relate issue.

**Results and Discussion**

Child mortality is observed for 71 different countries. It is observed that the highest child mortality was found for Angola 392.4367 country. The lowest mortality rate was found for the 187 in United Kingdom. The variation was found minimum for the country of Rwanda 16857.96 and maximum country of Chile 7604.37. The results are highly significant according to the time and areas. Graphical representation showed that the child mortality is reduced with a very much high decline rate as time passed by. It may be because the health departments are now have more awareness as compare to the previous time.

**Reference**


