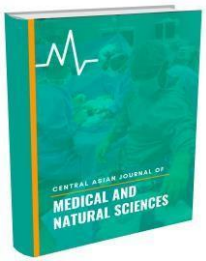

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*Article*

# A Statistical Study on the Most Important Factors Affecting Infant Mortality in Iraq

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**Abstract:** Infant mortality remains a significant health challenge in Iraq and other developing countries, with approximately 40 deaths per 1,000 live births. This study aims to identify key factors influencing infant mortality in Iraq by analyzing World Health Organization data from 2010 to 2018. Despite existing efforts, there is limited understanding of how economic, social, and health conditions collectively impact infant survival. The research examined variables such as age, gender, health and nutrition status, and the socioeconomic conditions of families and communities. The findings reveal that poor health and nutrition, coupled with low socioeconomic status, are the primary determinants of infant mortality. The study suggests that improving maternal and infant health care, enhancing community health education, and addressing poverty-related challenges are essential for reducing infant deaths. Further research is needed to deepen understanding and develop targeted interventions.

**Keywords:** Infant Mortality, Iraq, Health Determinants, Socioeconomic Status, Maternal Care

## 1. Introduction

Infant mortality in Iraq is considered one of the severe health problems facing the country. This problem is considered the result of several factors that affect the health of infants in Iraq, and lead to an increase in the mortality rate among them. Infant mortality is one of the most important health indicators that measure the quality of health care and the state of public health in countries, and it greatly affects human development indicators. Iraq is considered one of the countries with high infant mortality rates, which can be reduced by addressing the factors affecting it.

Among the factors affecting infant mortality in Iraq are poverty, economic factors, security conditions, armed conflicts, lack of health care, poor nutrition, lack of maternal and child health care, and high rates of environmental and air pollution. To improve health care for infants in Iraq, these factors must be addressed and the necessary health care and treatment provided to them. This requires joint efforts from the government, civil society and international organizations to improve the quality of health care, enhance health awareness, and provide an appropriate environment for the healthy growth and development of infants [1].

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## 2. Materials and Methods

**First, Research methodology:**

The research relied on the inferential statistical approach, using statistical data from the statistical compilation for the year 2022. Achieving the research objectives required the use of a statistical measure such as regression, in addition to statistical tests (f/t test). [2]

**Second, Research problem:**

It has been noted recently that there is a noticeable increase in infant mortality in Iraq, which prompts the researcher to delve into this topic and identify the most important reasons that lead to this.

Among the problems and reasons are:

1. Difficulty collecting the data necessary for the study.
2. Determine the best statistical methods for analyzing data, which must be appropriate for the sample size and the variables studied.
3. Therefore, this research requires a careful analysis of the factors affecting infant mortality in Iraq. [3]

**Third, The importance of research:**

The importance of research on infant mortality in Iraq is to seek to understand the factors that affect this health problem and work to reduce the number of infant deaths in Iraq.

**Fourth, Research objective:**

The research aims to identify the most important reasons behind the high infant mortality in Iraq and find ways to address them, including:[4]

1. Health factors: such as chronic diseases and nutritional deficiencies.
2. Social and economic factors: such as poverty, unemploymen, education, and marital status.
3. Environmental factors: such as the type of housing, clean water, and other environmental conditions that have a negative impact on the health of infants and increase their risk of death.

**Fifth, Research hypotheses:**

Some hypotheses that can be identified for this research include[5]

1. There is no relationship between infant mortality in Iraqand other factors
2. There is a relationship between the number of infant deaths and the number of recorded live births.

**Sixth, The research sample:**

All infants in Iraq for the period (2022).

Seventh: Limits of research: [6]

1. If we search for infant mortality in Iraq, the limitations of the search could be:. Timeline: Based on the data of the statistical group for the year (2022).
2. Location: All governorates of Iraq.

**Previous studies:**

A study of the factors that cause infant mortality in Basra Governorate, conducted by researchers from the University of Basra. This study aims to analyze the factors affecting the occurrence of infant mortality in Basra Governorate.[7] A study of the rates and causes of death in children under five years in Iraq, conducted by the World Health Organization.

This study aims to analyze death rates in children under five years in Iraq, identify the main causes of their occurrence, and provide appropriate recommendations. The study "Analysis of the Factors of Infant Mortality in Iraq" conducted by researchers from the College of Medicine at the University of Mosul. This study aims to identify the factors influencing the incidence of infant mortality in Iraq.

Study "Factors of Infant Mortality in Basra Governorate" conducted by researchers from the University of Basra. This study aims to analyze the factors affecting the occurrence of infant mortality in Basra Governorate [8]. The study "Rates and Causes of Mortality in Children Under Five in Iraq" conducted by the World Health Organization.

This study aims to analyze death rates in children under five in Iraq, identify the main causes of their occurrence, and provide appropriate recommendations. The study "Factors of infant mortality in Nineveh Governorate" conducted by researchers from the College of Medicine at the University of Mosul. This study aims to analyze the factors affecting the occurrence of infant mortality in Nineveh Governorate. [9]

**HOW THE SEARCH WOR**

Child deaths in t governorates of Iraq were taken as a research samplet obtain the necessary data for the research and to ensure the accuracy of answering the questions. Then the statistics collected on child deaths in Iraq were taken. The data was then processed using the statistical analysis program SPSS to extract the results. The researchers used multiple linear regression analysis. For the purpose of explaining the most important causes of infant mortality in Iraq and to find out the causes and methods of prevention, the data was transcribed into the ready-made statistical program SPSS and we obtained the results shown in the research [10]

## 3. Results

**The most important factors affecting infant mortality in Iraq:**

Infant mortality in Iraq is a serious health problem, and is affected by a number of different factors, including:

1. Economic situation: The poor economic situation in families can affect the access to necessary health care for infants, and this increases the risk of their death.
2. Medical conditions: Some serious medical conditions such as pneumonia, diarrhea and fever can lead to the death of infants, especially if the necessary treatment is not obtained in a timely manner. [11]
3. Undernutrition: Undernutrition can lead to poor infant health and increased risk of death.
4. Environmental conditions: Polluted environmental conditions such as water and air pollution can negatively impact the health of infants and increase their risk of death.
5. Lack of health care: Lack of available health care can result in infants not having timely access to necessary treatment, which increases their risk of death.
6. Security conditions: Unstable security conditions can put infants at risk and reduce access to necessary health care and treatment. [12]
7. Health policies: Government health policies can affect the availability of health care for infants and provide them with the necessary vaccines and treatment, and this may lead to a reduction in their risk of death

**a. Deaths are usually classified into two main categ:** [13]

1. Natural deaths: These include deaths that occur due to a disease or natural health condition such as heart disease, cancer, stroke, and other chronic diseases. These deaths are considered the result of a natural process in the human body.
2. Unnatural deaths: These include deaths that occur due to chronic diseases, tuberculosis, and infectious childhood disease

Multiple linear regression analysis

Multiple Linear Regression Analysis is a statistical method used in research to analyze the relationship between several independent variables and one dependent variable. This analysis is used to determine the nature of the relationship between the dependent variable and the independent variables, and to predict the value of the dependent variable based on the values given to the independent variables.[14]

Multiple linear regression analysis is performed by applying a mathematical model that expresses the relationship between variables, and the coefficients of this model are estimated using the data available from the study. After estimating the coefficients, the model can be used to predict the values of the dependent variable when certain values of the independent variables are entered [15].

Table 1. Shows the distribution of infants by governorate:

| Governorates | Number of child deaths in Iraq 2022 | Number of births registered in Iraq in 2022 | Unemployment rate in 2022 | Per capita pure water 2022 | Dependency ratio |
|---|---|---|---|---|---|
| نينوى | **4683** | **117138** | **14.9** | **238.1** | **85.76** |
| كركوك | **1804** | **45604** | **7.4** | **363.7** | **67.29** |
| ديالى | **630** | **42471** | **20.4** | **151.5** | **70.23** |
| الانبار | **757** | **38633** | **7.9** | **211.4** | **81.80** |
| بغداد | **7868** | **215335** | **12.0** | **91.4** | **64.46** |
| بابل | **2475** | **70050** | **7.8** | **224.9** | **77.96** |
| كربلاء | **1300** | **39077** | **12.3** | **113.6** | **78.98** |
| واسط | **1103** | **47265** | **10.3** | **140.3** | **77.17** |
| صلاح الدين | **612** | **44940** | **7.6** | **189.0** | **90.85** |
| النجف | **1547** | **46783** | **10.7** | **206.7** | **79.81** |
| القادسية | **1629** | **38820** | **12.9** | **218.1** | **87.55** |
| المثنى | **611** | **81206** | **14.3** | **149.3** | **89.26** |
| ذي قار | **1704** | **66757** | **20.9** | **167.4** | **77.73** |
| ميسان | **643** | **38815** | **13.6** | **68.6** | **79.36** |
| البصرة | **4055** | **95325** | **12.3** | **111.7** | **75.81** |

Data on infant mortality was collected from the statistical compilation for the year 2022, as shown in Table No. (1), which shows the situation of Iraq in the year 2022. When the data was analyzed using the (SPSS) program and relying on the multiple linear regression model, where the dependent variable (Y) represented Infant mortality rate

X 1 represents the number of live births

x2 Unemployment rate

x3 per capita pure water

x4 dependency ratio

It was found that the most significant of the above variables in the model is X1, which represents the number of live births. The significance of this variable using the T test was (0.000), as shown in the table Number (2):

Table 2. Shows the most significant variables in the model:

| SIG | U1 CONFUG TS | | U1 CONFUG B | | model |
|---|---|---|---|---|---|
| | | BETA | SOLD ERROR | | Dependency rat<br>Per capita share<br>pure water<br>Unemployment<br>rate for<br>individuals in Ira<br>for the year 202<br>Number of<br>registered birth<br>of children in Ira<br>for the year 202<br>Number of deatl<br>of children in Ira<br>f |
| 402 | 875- | 943 | 925.247 | -809.650 | |
| 000 | 7.017 | 171 | 005 | 3.239E-02 | |
| 232 | 1.273 | 026- | 64.967 | 82.712 | |
| 845 | 200- | 007- | 788 | 158- | |
| 955 | 057- | | 1.524 | 8.748E-02- | |

The model is as follows

-0.158 X3-0.087 X4 Y=-809.65+0.0329

The coefficient of determination was (0.918) and the corrected coefficient of determination was (0.842) as shown in

In Table No. (3)

model R

R Square

Adjusted R Square

Sold error of the estimate

Table 3. Dependency ratio for 2022 in Iraq, per capita share of pure water for 2022

| Sold error of the estimate | Adjusted R Square | R Square | R | model |
|---|---|---|---|---|
| 921.58 | 779 | 842 | 918 | 1 |

Predictors: Constant

In Iraq, the unemployment rate for individuals in 2022, registered live births in 2022 in Iraq. The significance of the model reached (0.001), which means that the model is appropriate as shown in

Results of Table No. (4)

Table 4. Dependency ratio for 2022 in Iraq, per capita share of pure water for 2022

| sig | f | Mean Square | | df | Sum of Square | model |
|---|---|---|---|---|---|---|
| 001a | 13.349 | 11337119.090 | | 4 | 45348476 | 1 Regression |
| | | 849302.457 | | 10 | 8493024.6 | Residual |
| | | | | 14 | 53841501 | Total |

a. Predictors:(Constant )
In Iraq, the unemployment rate for individuals in 2022, registered live births in 2022 in

b. Dependent Variable
Iraq Number of child deaths in 2022 in Iraq. Thus, the most important factor affecting infant mortality in Iraq, according to 2022 data, is the number of live births.

## 4. Discussion

Among the leading causes of infant mortality in Iraq include lack of basic health care, high rates of poverty and homelessness, lack of proper nutrition, and lack of access to clean water and safe sanitation. Improving the health and economic situation in Iraq could reduce infant mortality.

Basic health care must be strengthened, essential vaccines must be provided, nutrition and access to clean water must be improved. Public health awareness must also be strengthened and appropriate training provided to health personnel.

In addition, the Iraqi government, international organizations and the local community must work together to improve living conditions and provide the necessary support to families and children. Through joint efforts and a focus on prevention and early intervention, infant mortality in Iraq can be reduced and their health and well-being improved.

## 5. Conclusion

Through statistical application, the researchers reached the following conclusions.

1. It was found that the most significant of the above variables in the model is X1, which represents the number of live births. The significance of this variable using the T test was (0.000), as shown in Table No. (2).
2. It was found that the coefficient of determination reached (0.918) and the corrected coefficient of determination reached (0.842), as shown in Table No. (3).
3. It was found that the significance of the model reached (0.001) and was taken to mean that the model is appropriate, as shown in the results, Table No. (4).
4. It was found that the most important factor affecting infant mortality is the number of registered live births.
5. The following factors (unemployment rate, per capita share of pure water, high

**Recommendations:**

1. Improving health awareness and education in the local community, to enhance infant health and reduce mortality.
2. Improving health care for mothers and infants, and providing the necessary health care capabilities.
3. Providing specialized and continuously available health services for mothers and infants, and providing the necessary training for health personnel.
4. Encouraging families to pay attention to the health of their infants, and providing them with the necessary support to achieve this.
5. Improving the economic and social situation of families and communities exposed to poverty and difficult circumstances, which increase the likelihood of infant death.
6. Encouraging more research and studies on this topic, which can provide more information about the factors that affect infant mortality and how to improve their health.
7. The researchers recommended providing good health services in hospitals, especially maternity departments, infant departments, and health centers in general.
8. We should encourage reducing the size of the family, especially families with a low economic level. This is economic resources and the number of

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