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The Impact of Carbon Emissions on Infant Mortality Rate in Azerbaijan

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ABSTRACT

This is the pioneering study to examine the impact of CO2 emissions on infant mortality rates (IMR) in Azerbaijan using data covering the period 1982-2022. The stationarity levels of the variables were analyzed with nonlinear unit root tests (KSS, Sollis and Kruse) and the results showed that CO2 was non-stationary while IMR was stationary. We determined the existence of a long-run relationship between the variables and analyzed the long-run effects using the A-ARDL method. The findings revealed that a 1% increase in CO2 emissions increases IMR by 1.69% on average. Causality analysis using the Fourier Todo-Yamamoto test shows that there is a unidirectional causal relationship from CO2 to IMR. These results emphasize the critical impact of environmental pollution on infant health.

Keywords: Infant Mortality Rate, Carbon emissions, A-ARDL, Fourier Todo-Yamamoto Causality

JEL Classification: C22, K32, Q53

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1. INTRODUCTION

The modern era faces numerous challenges that significantly impact people's living standards and quality of life. To address these issues, governments around the world implement various measures. Among these challenges are global problems such as climate change and the adverse effects of environmental factors on the population's well-being. To tackle these issues, countries are collaborating and taking collective action. Each nation examines the root causes of these problems and seeks effective solutions. For instance, in many countries, studies have investigated the impact of carbon emissions on public health, national development, and child mortality. Based on the findings of these studies, countries are developing policy plans tailored to their unique circumstances (Sorooshian, 2024).

Infant mortality is one of the most important problems in many countries. Infant mortality is one of the most important indicators of the health, social, and economic status of a society. Typically, we measure the infant mortality rate as the number of infants per 1000 live births who pass away before reaching one year of age. This indicator provides valuable information about a country's medical infrastructure, socio-economic status, and ecology. Many factors can be responsible for infant mortality, and these factors can vary across regions. Some of the main causes of infant mortality include medical factors, socio-economic factors, ecological factors, and pregnancy-related factors. Medical reasons include early birth (blind people are born before they should be, which stunts their organ development), pathogenic diseases (pneumonia, diarrhea, septicemia, and meningitis raise the risk of blind people dying), congenital defects (urinary disorders, nervous system problems, and genetic diseases), and nutritional conflict (babies' immunity is weakened by not being breastfed and microelement conflicts) (Alam et al., 2020; Black et al., 2016).

Socio-economic causes play a significant role in infant mortality and include several interrelated factors. Poverty remains one of the most critical contributors, as it limits access to essential medical services and proper nutrition, both of which are vital for ensuring the health and survival of infants. Infants born into impoverished conditions are more likely to experience malnutrition, which compromises their immune systems and increases their susceptibility to diseases. Additionally, poverty often exacerbates other health risks due to inadequate living conditions, such as overcrowding and exposure to unsanitary environments (Black et al., 2013).

The education level of mothers is another key socio-economic determinant of infant health. Mothers with limited or no education may lack essential knowledge about nutrition, hygiene, and preventive healthcare practices that are crucial for protecting their infants' well-being. For instance, they may be less likely to seek prenatal care, adhere to vaccination schedules, or recognize early signs of illness in their children. Studies consistently demonstrate a strong correlation between maternal education and improved health outcomes for infants and children (Cleland and Van Ginneken, 1988).

The quality of health services also significantly influences infant mortality rates. Insufficient medical infrastructure, outdated or limited technologies, and a lack of professional healthcare personnel often result in delays or inadequacies in diagnosing and treating health issues in infants. For example, complications during childbirth or neonatal infections may go untreated due to a lack of skilled birth attendants or specialized neonatal care facilities. The disparity in healthcare quality is especially pronounced in low-income and rural areas, where resources are scarce and access to advanced medical care is limited (Travis et al. 2004).

Environmental factors further exacerbate the risk of infant mortality. Air pollution poses a significant threat to infants, who are particularly vulnerable to respiratory illnesses caused by polluted air. Prolonged exposure to pollutants such as fine particulate matter (PM2.5) and nitrogen dioxide (NO2) can impair lung development and increase the risk of respiratory infections, which are among the leading causes of infant mortality worldwide. Moreover, a lack of access to clean water and proper sanitation is a critical environmental determinant. Contaminated water sources and inadequate hygiene practices create ideal conditions for the spread of infectious diseases, such as diarrhea, which can be fatal for infants due to dehydration and weakened immunity (WHO, 2018).

Issues during pregnancy also have a profound impact on infant mortality. Maternal health problems, such as anemia, diabetes, and hypertension, increase the risk of adverse birth outcomes, including preterm birth, low birth weight, and neonatal complications. Pregnant women suffering from these conditions often require close monitoring and specialized care, which may not be readily available in regions with underdeveloped healthcare systems. Furthermore, inadequate prenatal services can exacerbate these risks. Regular prenatal check-ups are essential for early detection and management of potential complications, yet many expectant mothers lack access to these services due to financial, logistical, or cultural barriers. This lack of early medical intervention often results in preventable deaths, as conditions that could have been managed or treated remain undiagnosed until it is too late (Say et al., 2014). Addressing these socio-economic, environmental, and pregnancy-related causes requires a multifaceted approach that includes policy reforms, increased investment in healthcare infrastructure, and educational initiatives targeted at improving maternal health and child welfare. By focusing on these determinants, governments and international organizations can work together to reduce infant mortality rates and ensure a healthier start to life for all children (WHO, 2023).

To reduce infant mortality, the World Health Organization (WHO) has set ambitious goals aimed at eliminating preventable deaths in children under five and newborns. Specifically, the WHO targets reducing neonatal mortality to 12 per 1,000 live births and under-five mortality to a maximum of 25 per 1,000 live births by 2030 (United Nations, 2015). Improving global child health and advancing towards the United Nations' Sustainable Development Goals (SDGs) hinge on achieving these milestones (Liu et al., 2016). Notably, progress toward these targets has been encouraging, as global infant mortality rates have steadily declined over recent decades. A combination of factors, including significant advancements in healthcare infrastructure, the expansion of maternal education, the implementation of widespread immunization programs, and improved access to clean water and sanitation facilities, have contributed to this positive trend (Lawn et al., 2005). Investments in maternal and child healthcare services have played a pivotal role in reducing preventable deaths, particularly in low- and middle-income countries. Additionally, international initiatives such as the Global Vaccine Action Plan (GVAP) and the promotion of skilled birth attendance have further supported these achievements. Despite these improvements, regional disparities in infant mortality rates persist, with sub-Saharan Africa and South Asia continuing to report disproportionately high figures. These disparities underscore the need for targeted interventions that address the socio-economic and systemic barriers hindering progress in the most affected regions (WHO, 2023).

Analysis at the regional level highlights stark differences in outcomes. For instance, infant mortality rates in sub-Saharan Africa and South Asia are significantly higher compared to regions such as the European Union, North America, East Asia and the Pacific, Europe and Central Asia, Latin America and the Caribbean, the Middle East and North Africa, and OECD member countries (UNICEF, 2021). These disparities underscore the urgent need for targeted interventions tailored to the unique socio-economic and healthcare challenges faced by each region. Factors such as widespread poverty, limited access to quality healthcare, inadequate maternal nutrition, and environmental challenges—such as air pollution and unsafe water sources—disproportionately affect these regions, exacerbating the burden of infant mortality (You et al., 2015).

This paper seeks to contribute to this broader discussion by examining the specific relationship between carbon emissions and child mortality in Azerbaijan. Given Azerbaijan's unique socio-economic and environmental landscape, this analysis will shed light on how ecological factors, particularly carbon emissions, intersect with health outcomes. By exploring this relationship, the study aims to provide actionable insights to policymakers and stakeholders working to reduce child mortality and improve public health in the region.

2. LITERATURE REVIEW

Infant mortality is caused by many factors, one of which is environmental pollution. The relationship between environmental pollution and infant mortality is being investigated in various countries through large-scale studies for these countries. Based on the information obtained as a result of the research, a plan of political measures to solve the problem has been prepared. However, in studies conducted in many countries, some points have been overlooked and consequently not taken into account when examining the relationship between pollution and infant mortality. Examples include economic growth, the literacy level of the population, etc. The following articles are examples of these studies.

Analyzing the impact of increased industrial pollution on infant mortality, Tavassoli et al. (2020) show that the infant mortality rate (IMR) in the United States increased significantly in the late 19th and early 20th centuries due to increased industrial activities and the resulting pollution, using full-scale decennial censuses. Looking at African economies, Heft-Neal et al. (2018) found that a 1% increase in air pollution caused a 14% increase in infant mortality in Africa. However, Heft-Neal et al. (2020) estimated the impact of air pollution on infant mortality at 24%.

There is a few studies examining the relationship between health and education costs and infant mortality. Alemu (2017) used a fixed effect model (FEM) to analyze this relationship and found that a 1% increase in education expenditure and health expenditure relative to gross domestic product (GDP) increased infant mortality by 3.2 and 3.2 per 1000 live births, respectively, and decreased by 2.5 units, respectively. Van Malderen et al. (2019) and Abbuy (2018) similarly found that maternal literacy has a significant negative impact on infant mortality in Sub-Saharan Africa (SSA) and West African Economic and Monetary Union (WAEMU) countries respectively. Meanwhile, Zewdie and Adjiwanou (2007) found that maternal educational attainment was negatively associated with infant mortality in South Africa and noted that increased female participation in education reduced the probability of infant mortality by 21%. Bado and Sathiya Susuman (2016) found that government policies on maternal education contributed to a steady decline in infant mortality rates in selected SSA countries over the past two decades by increasing mothers' awareness of child health and hygiene. These studies suggest that increasing maternal literacy and spending on health and education are important steps towards reducing IMR. In addition, public health expenditure was found to be an important determinant of infant mortality rates in Nigeria by Matthew et al. (2018) using a fully modified ordinary least squares method, Lu et al. (2019) and Edeme et al. (2017).

Aliyu and Ismail (2016) investigated the effects of PM10 and carbon dioxide emissions on human mortality using data from 35 African countries. The results showed that both PM10 and carbon dioxide levels caused significant increases in infant, under-5 and adult mortality. Similarly, Heft-Neal et al. 2018) examined the relationship between air quality and infant mortality in Africa and found that higher PM2.5 concentration levels were positively associated with infant mortality rates. In particular, every 10 $\mu g/m^3$ increase in PM2.5 concentration was associated with a 9% increase in infant mortality rates.

A significant negative association between female literacy and infant mortality rate (IMR) in South Asian countries was shown in a study by Maqsood et al. 2020). This is consistent with the findings of Tagoe et al. (2020) who used the proportional hazards model and a predictive model to analyze infant mortality in Sierra Leone. However, Kiross et al. (2020) found that primary and higher levels of education were associated with reduced infant mortality rates in Ethiopia. In addition, Shapiro and Tenikue (2017) found that increasing women's educational attainment can lead to significant reductions in infant mortality rates in high-risk areas, particularly in regions such as SSA (Sub-Saharan Africa).

Hill et al. (2019) also examined the adverse health effects of air pollution in the United States between 2000 and 2010, taking income inequality into account. They find that air pollution has stronger negative effects on human life expectancy in areas with higher income inequality.

Matthew et al. (2018) examined the relationship between greenhouse gas (GHG) emissions, including carbon dioxide, and health indicators in Nigeria using time series data for the period 1985-2016. They conducted cointegration analysis with an autoregressive distributed lag (ARDL) model and found that every 1% increase in GHG emissions reduces human life expectancy by 0.0422% and causes a 146.6% increase in infant mortality rates. Research shows that implementing measures to reduce carbon dioxide emissions can have a positive impact on health outcomes.

This can also be observed in a study by Greenstone and Hanna (2014), who use a difference-in-differences approach to examine the impact of environmental regulations on air pollution and infant mortality in India. Their study showed that government intervention against air pollution was directly associated with significant reductions in infant mortality rates (IMRs), suggesting a clear link between air pollution and infant mortality. Similarly, Cesur et al. (2016) found that the adoption of natural gas by residents of a city in Turkey led to a significant reduction in IMRs. Specifically, a 1% increase in natural gas subscriptions among residents led to a 4% decrease in IMR, which translates into a reduction in air pollution.

3. METHODOLOGY

The stationarity of the variables was analyzed with nonlinear unit root tests such as KSS (2003), Sollis (2009) and Kruse (2011) depending on the characteristics of the variables used in the study. Johansen (1988) method was used to investigate the presence of cointegration among these variables since the variables are I(1) series, but this method was not preferred due to the observed break in the variables. Gregory-Hansen (1996) criticized Johansen (1988) for not taking breaks into account in his study, while Hatemi-J (2008) criticized Gregory-Hansen (1996) for considering only one break and designed his study to investigate the existence of cointegration in the presence of two breaks. In contrast, Maki (2012) developed a test that allows for the existence of cointegration under more than one break. Despite the fact that these tests take breaks into account, they generally do not allow simultaneous analysis of the short and long-run dynamics between variables. The ARDL method was proposed by Pesaran (2001), which allows simultaneous analysis of both short- and long-run dynamics between variables, but does not allow for the existence of cointegration in the presence of a break in the variables. On the other hand, the Bootstraping ARDL method developed by McNown (2018) and the A-ARDL method developed by Sam (2019) are cointegration tests that also examine the short and long-run dynamics between variables under the assumption of single or multiple breaks in variables. Based on this theoretical framework, the A-ARDL method was preferred to obtain the short and long-run dynamics along with the existence of cointegration relationship between the variables under the assumption that there is a break(s) in the analysis. Moreover, the long-run effects of CO2 on IMR are estimated by Fully Modified Ordinary Least Squares (FMOLS) and Cointegrated Conjoint Regression (CCR) method. We analyzed the causality relationship between the variables using the Fourier-Toda-Yamamoto causality test developed by Nazlıoğlu (2016). Fundamental difference of this test from Granger (1969) and Toda-Yamamoto (1995) causality tests is that it can take soft and sharp breaks into account.

4. DATA AND MODEL

This study investigates the impact of CO2 emissions on changes in Infant Mortality Rate in Azerbaijan using annual data for the period 1982-2022. Definitional information about the variables is presented in Table 1.

Table 1: Description of Variables

Symbol	*Variables*	*Unit*	*Period*	*Source*
CO2	Carbon Emissions	Kilo ton(kt)	1984-2022	Our World in Data (2024)
IMR	Infant Mortality Rate	Death per 1000 live birth		World Bank (2024)

In order to better recognize the variables used in the analysis, descriptive statistics were calculated and the results are given in Table 2.

Table 2: Descriptive statistics

	CO2	IMR
Mean	4.63	52.2
Median	3.72	53.6
Maximum	7.58	86.5
Minimum	2.98	16.1
Std. Dev.	1.59	24.3
Skewness	0.83	-0.14
Kurtosis	1.86	1.44
Jarque-Bera	6.88	4.31
Probability	0.03	0.12
Observations	41	41

CO2 emissions have averaged around 4.63 over the years, the median value (3.72) is lower than the mean, indicating that the distribution is skewed to the right, while the standard deviation value (1.59) indicates that fluctuations are moderate. The difference between the maximum value 7.58 and the minimum value 2.98 reveals that there are significant fluctuations in CO2 emissions. Positive skewness (0.83) indicates that high emission values are observed in some years, while the kurtosis value (1.86) indicates that the distribution is not sensitive to extreme values and is flatter than a normal distribution. Jarque-Bera test with a p-value of 0.03 reveals that the distribution of CO2 emissions is not normal.

IMR is very close to the median value of 53.6 with a mean of 52.2, indicating that the distribution is largely symmetrical. Standard deviation value (24.3) indicates high fluctuations, while a wide difference between the maximum (86.5) and minimum (16.1) values suggests that the IMR has decreased significantly over the years. Skewness value (-0.14) is almost zero, confirming that the distribution is symmetric. Kurtosis value (1.44) indicates that the sensitivity to outliers is low and the distribution has a kurtotic structure. According to the Jarque-Bera test, the p-value of 0.12 indicates that the IMR is in compliance with the normal distribution.

In addition to the descriptive statistics given in Table 2, Pearson correlation coefficient (assuming that both variables are normally distributed at 1% significance level) was calculated to determine the strength and direction of the relationship between CO2 and IMR and the results are given in Table 3.

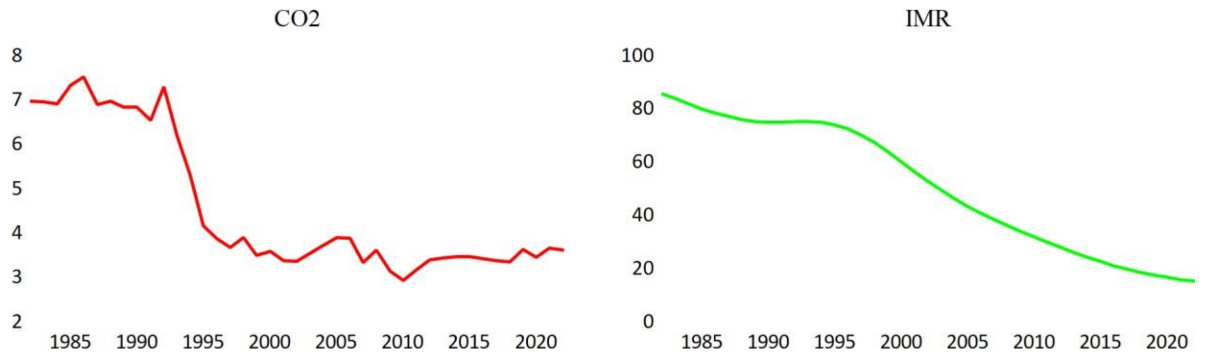
Table 3: Correlation matrix

	CO2	IMR
CO2	1	0.7817
IMR	0.7817	1

There is a strong positive correlation of 0.7817 between CO2 emissions and infant mortality rates (IMR), indicating that both variables have a strong relationship with each other. It means that as CO2 emissions increase, infant mortality rates tend to increase, whereas as CO2 emissions decrease, infant mortality rates may tend to decrease. However, this only shows a correlation and does not provide any explanation on causality; that is, whether the increase in CO2 directly causes infant mortality rates should be investigated through more detailed analysis. Therefore, the causality relationship between CO2 and IMR was also investigated and the results are presented in Table 7. In general, descriptive statistics help us to recognize the variables in general, but they are not sufficient to see the dynamics of the variables over time. For this purpose, the series are plotted over time and presented in Figure 1.

Examining the graph of carbon emissions, it would be more accurate to divide the series into two parts. 1985-1995 Period: A dramatic decline in CO2 emissions is observed in the early 1990s. This is due to Azerbaijan's separation from the Soviet Union and the economic and industrial decline during the transition period. The post-independence slowdown in economic activity and the downsizing of heavy industry led to a rapid decline in CO2 emissions. After 1995: The downward trend of CO2 emissions has stalled and emissions have been relatively stable since the 2000s. This is attributed to the restructuring of Azerbaijan's energy sector based on oil and gas exports. However, environmental regulations may not have been effective during this period. Since CO2 has a downward trend with a dramatic decline while IMR has a dominant downward trend, nonlinear unit root tests such as KSS(2003), Sollis(2009) and Kruse(2011) were applied in order to make a clear decision about the stationarity of the series. The test results are presented in Table 4.

Figure 1: Time Series Graphs of Variables



According to Table 4, it is understood that both variables are non-stationary or I(1) series in the equation with constant. However, in the equation with constant and trend, IMR series is stationary at level and CO2 series is not stationary at level. Considering that both variables include a trend, we believe that it is more accurate to make a decision according to the unit root test with constant and trend. Therefore, it is decided that IMR variable is I(0) and CO2 variable is I(1) series.

Table 4: Unit Root Results

Variables	KSS(2003)		Sollis(2009)		Kruse(2011)		
	Constant						
	Test stat	Lag	Test stat	Lag	Test stat	Lag	Results
LnCO2	-1.401	0	1.2414	0	2.2681	0	I(1)
LnIMR	-2.3397	1	2.6633	1	5.3299	1	I(1)
	Constant&Trend						
LnCO2	-1.6505	0	2.4193	0	2.6635	0	I(1)
LnIMR	-4.8256***	1	2.6884	1	27.364***	1	I(0)

**** indicates rejection of hypothesis H0 at 1% level*

Considering that the series are at different orders of stationarity and there is a break in CO2, the cointegration relationship for the model shown by equation (1) is analyzed by the A-ARDL method and the results are presented in Table 5.

$$LnIMR_t = f(LnCO_2) \quad (1)$$

Examining the information presented in Table 5, it is determined that Case III is appropriate among the ARDL equations for the model given by equation (1). It should be reminded that Case III indicates the model with a constant in the ARDL equation. In addition, 1992 was determined as the break date and ARDL(2,1) was chosen as the most appropriate lag number for the model based on AIC and BIC criteria. In order to determine the existence of a cointegration relationship between the variables with the specified A-ARDL(2,1) model, the Foverall, tdependent and Findependent test values should be compared with the Pesaran (2001), Nrayan (2005) and Sam (2019) critical values, respectively. Clearly, as presented in Table 5, the test statistics calculated for all three tests are greater in absolute value than the respective critical values. Thus, the null hypothesis stating that there is no cointegration relationship between the variables is rejected and it is concluded that there is a cointegration relationship between the variables.

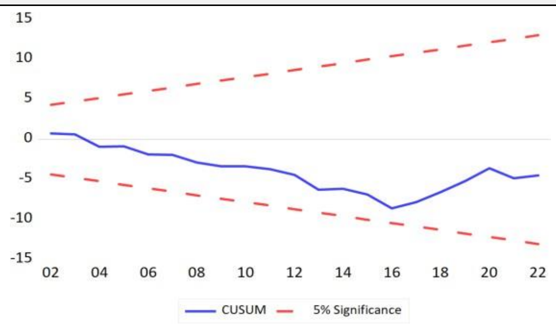
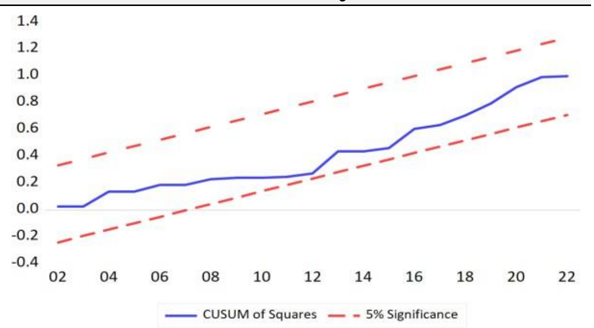
Table 5: A-ARDL Cointegration Results

Model	ARDL order	Break Time	$F_{overall}$	$t_{dependent}$	$F_{independent}$	Results
Case III	2,1	1992	24.281***	-4.4966***	39.200***	Cointegration
Critical Values	Pesaran et al. (2001)		Narayan (2005)		Sam et al. (2019)	
	Lower	Upper	Lower	Upper	Lower	Upper
1%	6.840	7.840	7.625	8.825	7.430	12.40
5%	4.940	5.730	5.260	6.160	4.100	7.410
10%	4.040	4.780	4.235	5.000	2.840	5.370

Diagnostic tests results

R^2	*F-statistics*	*JB*	*BG-LM*	*White*	*R-R*
0.9999	160072(0.0000)	3.0925(0.2130)	0.2947(0.8289)	0.6353(0.7418)	0.0232(0.9816)

Parametres Stability Tests

CUSUM	CUSUM SQ
	

JB; Jarque-Bera normality test, BG-LM; Breusch Godfrey LM autocorrelation test, White-heteroskedasticty test; R-R; Ramsey-Reset refers to specification testing. *** ,**,*indicates that the null hypothesis is rejected at 1%, 5% and 10% significance level, respectively.

In addition to the cointegration test results, the results of the diagnostic tests for the A-ARDL model are also presented in Table 5. Very high value of adjusted R^2 of 0.9999 indicates that 99.99% of the variation in infant mortality is explained by two lags of IMR and one lag of Carbon emission. Meanwhile, the F statistic and the associated probability value indicate that the model is generally significant, while the JB, BG-LM and White tests show that the model errors are normally distributed and free of autocorrelation and heteroskedasticity. R-R test shows that the model is functionally correct. On the other hand, CUSUM and CUSUMSQ plots indicate that the model parameters remain stable over time and that there are no breaks in the parameters.

The long-run effects of CO_2 on IMR are estimated by CCR and FMOLS methods and the results are presented in Table 6.

Table 6: Long-run Estimates

Variabls	CCR	FMOLS
Constant	1.2847***	1.3223
LCO2	1.7137***	1.6894
D1992	-0.5023*	-0.4860
R^2	0.9028	0.9039
SER	0.1730	0.1720

Analyzing the CCR and FMOLS results given in Table 6, it is seen that the estimators obtained with both methods are quite close to each other. However, it was decided to interpret the estimators obtained with the FMOLS method according to the adjusted R2 and SER (standard error of regression) criteria. Accordingly, it is possible to say that a 1% increase in carbon emissions increases infant mortality by 1.69% on average in the long run. The coefficient of d1992 dummy variable is equal to 0.4860. In 1992, the main reasons for the increase in infant mortality rates in Azerbaijan were the collapse in economic and health infrastructure, the negative effects of the Karabakh War, nutritional deficiencies and deterioration in hygiene conditions.

Tablo 7: Causality Test Results

Causality Direction	Test statistics	k	lag	Results
$CO2 \rightarrow IMR$	15.506***	3	3	H_0 Reject
$IMR \rightarrow CO2$	5.0868	3	3	H_0 Don't Reject

*** ,indicates that the null hypothesis is rejected at 1% significance level.

According to the causality test results presented in Table 7, there is a unilateral causality relationship from CO2 to IMR. The unidirectional causal relationship from CO2 emissions to infant mortality rates (IMR) reveals the negative impacts of environmental degradation on infant health. High CO2 emissions increase air pollution, raising the risk of respiratory diseases and water and foodborne infections, making infants with underdeveloped immune systems particularly vulnerable. Environmental risk factors increased through climate change also indirectly increase infant mortality. These findings highlight the impact of environmental pollution on health and demonstrate the importance of environmental policies in improving public health. However, IMR was not found to affect CO2 emissions, so the relationship was found to be unidirectional. Policy makers should develop sustainable policies that tackle air pollution to reduce infant mortality.

5. CONCLUSION

The results of this study are considered as an important step in understanding the long-term effects of environmental pollution on public health in Azerbaijan. The study found that CO2 emissions increase infant mortality rates, clearly demonstrating the direct and indirect effects of environmental pollution on health. In particular, a 1% increase in CO2 emissions increases IMR by 1.69%, which shows the delicate link between environmental pollution and infant health.

The Fourier Todo-Yamamoto test showed that CO2 has a unidirectional effect on IMR, but IMR does not affect CO2 emissions. This finding emphasizes that lack of environmental sustainability directly shapes health outcomes. It suggests the need for not only environmental policies, but also the development of health services in a way that is sensitive to environmental factors. Future policy and research should aim to more comprehensively address the health impacts of environmental degradation.

6. POLICY RECOMMENDATIONS

Multidimensional and integrated policies are needed to reduce the negative impacts of CO2 emissions on infant mortality rates. First, Azerbaijan should adopt a comprehensive energy transition strategy aimed at increasing the use of renewable energy sources and reducing fossil fuel dependence. Modernization of industrial processes, promotion of technologies to increase energy efficiency, and dissemination of environmentally friendly practices that reduce carbon emissions are key steps in this process. Furthermore, strict environmental regulations and monitoring mechanisms should be established to combat air pollution.

In terms of public health, it is critical to improve health services, especially in the areas most affected by pollution. Programs for maternal and infant health should be scaled up and a health infrastructure that is sensitive to environmental factors should be established. For example, preventive and curative approaches should be adopted in health services, taking into account environmental risks such as respiratory diseases caused by air pollution.

Finally, public education and awareness-raising campaigns should be organized to raise environmental awareness. Encouraging environmentally friendly behaviors can contribute to making environmentally sensitive decisions at the individual level. In this context, Azerbaijan should participate more actively in international environmental policies and cooperation, utilize global funds and take concrete steps towards sustainable development goals. These recommendations can create a policy framework that will provide long-term benefits in both the environmental and health spheres.

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