# Government effectiveness and child development in low-middle income countries: COVID-19 pre-pandemic time

## Efectividad del gobierno y desarrollo infantil en países de ingresos bajos-medianos: período previo a la pandemia COVID-19

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### Abstract

**Introduction:** The effect of the COVID- 19 pandemic on the development of children is still uncertain; therefore, it is essential to estimate their development status in the time before the pandemic. The sustainable development goals favor all the resources and strategies to stimulate early childhood development. Government effectiveness is the central axis of developing such actions, policies, and procedures. **Methods:** We used the early child development module and index from national health surveys (MICS) of 33 countries to calculate the children on track. We also use the World Bank Governance Index, specifically the effective governance score. In addition, we carry out analysis with ArcGIS and GeoDa software to evaluate geographic correlations between the variables studied and identify geographic patterns of child development levels and effective governance. Pearson and Spearman correlation tests were performed in Stata 15.1 software. **Results:** We studied children from 33 low and middle-income countries; from 7 world regions. Thailand (91.1%) and Turkmenistan (90.7%) have the highest percentages of child development and the lowest in Burundi (39.6%). The lowest value on GE estimate is in Burundi (-1.3), and the highest in the Democratic Republic of Korea (1.0). In the GE Rank, the highest values are again in Korea (82.1%), and the lowest in Haiti (0.9%). The correlation grade between ECDI and GE Estimate was moderate positive (0.522, P-0.001, Correlation Spearman test), similarly to (0.518, P-0001, Pearson correlation test). The general spatial pattern prevails that the African regions present low government effectiveness and early child development scores, positively correlated in this study. **Conclusions:** With the most up-to-date data reported by countries, it is possible to establish the level of child development before 2019, the year in which the COVID-2019 pandemic began. Studies must be carried out during and after the pandemic to develop the direct and indirect damage received by children in the dimensions of development, in which the government response is decisive.

**Keywords:** Children; Government; Surveys; Income; Correlation.

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## Resumen

**Introducción:** el efecto que tendrá la pandemia de COVID- 19 en el desarrollo de los niños aún es incierto, por lo que es importante estimar su estado en el tiempo anterior a la pandemia. Los objetivos de desarrollo sostenible exigen favorecer todos los recursos y estrategias para estimular el desarrollo de la primera infancia. La efectividad del gobierno es el eje central del desarrollo de tales acciones, políticas y estrategias en todos los países, especialmente en los países de ingresos bajos y medianos. **Métodos: se usó** el módulo de desarrollo infantil temprano y el índice de las encuestas nacionales de salud (MICS) de 33 países, para calcular los niños que van por buen camino en su desarrollo. También se utilizó el Índice de Gobernanza del Banco Mundial, específicamente el puntaje de Gobernanza Efectiva. Además, se realizaron análisis con el software ArcGIS y GeoDa para evaluar correlaciones geográficas entre las variables estudiadas e identificar patrones geográficos de niveles de desarrollo infantil y gobernabilidad efectiva. Las pruebas de correlación de Pearson y Spearman se realizaron en el software Stata 15.1. **Resultados:** se estudiaron niños de 33 países de ingresos bajos y medios; de 7 regiones del mundo. Tailandia (91,1%) y Turkmenistán (90,7%) tienen los porcentajes más altos de desarrollo infantil y Burundi el más bajo (39,6%). Según la estimación de GE, el valor más bajo se encuentra en Burundi (-1,3) y el más alto en la República Democrática de Corea (1). En el GE Rank, los valores más altos se encuentran en Corea con 82,1% y los más bajos en Haití (0,9%). El grado de correlación entre el ECDI y la estimación de GE fue positivo moderado (0,522, P-0,001, prueba de correlación de Spearman), similar (0,518, P-0001, prueba de correlación de Pearson). El patrón espacial general que prevalece es que las regiones africanas presentan un puntaje bajo de efectividad del gobierno y desarrollo infantil temprano, que se correlacionan positivamente en este estudio. **Conclusiones:** Con los datos más actualizados reportados por los países sobre desarrollo infantil, se pudo establecer el nivel de desarrollo infantil antes de 2019, año en que comenzó la pandemia de COVID-2019. Es crucial que se realicen estudios durante y después de la pandemia con el objetivo de establecer los daños directos e indirectos que reciben los niños en las dimensiones del desarrollo, en las que la respuesta del gobierno es determinante.


**Palabras clave:** Niños; Gobierno; Encuestas; Ingresos; Correlación.

## Introduction

Low and middle-income countries (LMIC) have been the focus of international efforts to overcome vulnerabilities; however, each region entails particular political practices that determine the development of their populations.

Early child development is a process of maturation involving skills during the first years of life[1]. Several factors affect the Early child development (ECD), including poverty, poor parental practices, lack of child stimulation, and poor nutrition, affecting human capital and productivity in adulthood[2,3].

Governance is defined as the attempts of governments to steer groups of countries to pursue health as integral to well-being through the whole of government and society[4].

The individual health development governance sub-functions indices can aid policymakers in locating the sources of inadequate governance and developing appropriate interventions for ameliorating health situations[5].

In 2016, a study updated the number of low-development children, reporting approximately 43% of children under five in LMIC[6]. That meant a few changes from a previous study[7].

In 2020, another study calculated a suspected delay prevalence for the Early Childhood Development Index (ECDI) ranged from 3% in Barbados to 67% in Chad. Twenty-five percent of the children were suspected of delay[8].

The ECDI was included in the Multiple Indicator Cluster Surveys (MICS). The ECDI consists of a 10-item instrument covering four areas of development. A study estimated that 33% of children from some LMIC were not reaching their full cognitive or social-emotional developmental potential[9]. Other studies have also used the ECDI, showing the importance of children's books[10], parents' education, and interaction with the child[11,12,13] to improve their chances of developing correctly.

Early Child development is part of the plan 2030[10]. The increasing number of surveys with the ECDI in MICS surveys will monitor progress made in development areas[9–14].

The literature is still lacking a visual picture of levels of child development. Thus, this study aimed to assess children's proportions in some LMIC with available data pre-pandemic (COVID-19) and government effectiveness measures.

## Methods

This is an ecological study of 33 low - and middle-income countries with information available before the COVID-19 pandemic.

### Data Sources

### Geographic information systems

Using the ArcMap 10.6 software, the 33 countries in the global geographic spectrum were plotted. The geographic patterns of child development were analyzed, representing the percent progression of GE estimate and GE Rank.

We also used GeoDa.int Software implementing a spatial spectrum; the computation is based on standardized variables (ECDI and GE estimate) corresponding to correlations.

### Early Child Development Index

We used data from MICS; these surveys present robust, comparable data for more than 100 critical health and wellness indicators for women and children. Since the fourth round of MICS surveys (starting in 2009), surveys began to include a module on ECD. The ECDI is based on a 10-item instrument responded by the mothers or caregivers of children aged 36-59 months[15]. The questions are separated into four areas: Physical, Social-emotional, Learning, and Literacy-numeracy.

A child is considered on track for each domain if she passes on two, one, two, and one item. The ECDI considers a child to be developmentally on track if three of the four domains are progressing adequately.

For this study, the most recent results of each country were extracted, reported from 2016 to 2019, a time before the start of the COVID-19 pandemic.

### Government Effectiveness

The Worldwide Governance Indicators refers to aggregate and individual governance indicators for more than 200 countries in the period from 1996–2019, for six faces of governance: Voice and Accountability, Political Stability, Absence of violence; also, government effectiveness, regulatory quality, Rule of Law and Control of Corruption[16].

For the present study, we used the indicator of Government Effectiveness (GE) that interprets perceptions of public services, the quality of the service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government[16].

We use two measures of the indicator: the GE estimate (scale from -2 "weak" to +2 "optimal) and the GE rank (0 to 100%) of each country and the same year in ECDI.

### Statistical analysis

Pearson[17] and Spearman correlation tests were performed to estimate levels of correlation between ECDI and GE estimate and GE Rank.

The analyses were performed with Stata (StataCorp. 2017. Stata Statistical Software: Release 15.1. College Station, TX, USA: StataCorp LLC). MICS are public sources of information, and ethical approval was already obtained by the institutions responsible in each country.

## Results

We studied children from 33 countries, with survey years ranging from 2016 to 2019; countries that reported their most recent ECDI scores before 2016 were not considered.

**Table 1** shows the prevalence of Early Child Development (ECDI) for the 33 countries studied, grouped by UNICEF world region, and presents the GE estimate and GE Rank scores. The continents with the most significant number of countries were Africa and Asia.

Countries from seven world regions were studied; Thailand (91.1%) and Turkmenistan (90.7%) have the highest percentages of child development and the lowest Burundi (39.6%). The lowest value on the GE estimate is in Burundi (-1.3) and the highest in the Democratic Republic of Korea (1). In the GE Rank, the highest values are in Korea with 82.1%, and the lowest in Haiti (0.9%).

**Figure 1** shows the spatial conjunction between ECDI, GE estimate, and GE Rank. The general pattern is that the African regions present low indices of government effectiveness, which is positively correlated in this study. This reflects the world's neglect of an area that feeds many developed countries but lacks the means to promote effective interventions to benefit its children. Africa is a wealth mine for countries with high levels of development that do not seem to be interested in human development, the countries from which they derive so many benefits.

**Table 1.** Prevalence of Early Child Development (ECDI) for the 33 countries studied, grouped by UNICEF world region, Government effectiveness GE estimate, and GE Rank scores.

| Code | Year | Country | ECDI | GE Rank | GE Estimate | Region |
|---|---|---|---|---|---|---|
| BGD | 2019 | Bangladesh | 74.5 | 23.5 | -0.7 | South Asia |
| BLR | 2019 | Belarus | 87 | 44.2 | -0.1 | Eastern Europe and Central Asia |
| BEN | 2018 | Benin | 53.6 | 32.6 | -0.5 | West and Central Africa |
| BDI | 2017 | Burundi | 39.6 | 8.1 | -1.3 | Eastern and Southern Africa |
| CIV | 2016 | Côte d'Ivoire | 62.8 | 26.4 | -0.6 | West and Central Africa |
| KOR | 2017 | Democratic People's Republic of Korea | 87.7 | 82.1 | 1 | East Asia and Pacific |
| GMB | 2018 | Gambia | 67 | 27.4 | -0.6 | West and Central Africa |
| GNB | 2016 | Guinea | 48.9 | 3.8 | -1.6 | West and Central Africa |
| HTI | 2017 | Haiti | 65.4 | 0.9 | -2 | Latin America and Caribbean |
| IDN | 2018 | Indonesia | 88.3 | 59.1 | 0.1 | East Asia and Pacific |
| IRQ | 2018 | Iraq | 79.3 | 9.1 | -1.3 | Middle East and North Africa |
| JOR | 2018 | Jordan | 70.7 | 57.1 | 0.1 | Middle East and North Africa |
| KGZ | 2018 | Kyrgyzstan | 71.7 | 28.8 | -0.6 | Eastern Europe and Central Asia |
| LAO | 2017 | Lao People's Democratic Republic | 89.1 | 37.5 | -0.4 | East Asia and Pacific |
| LSO | 2018 | Lesotho | 73.1 | 18.2 | -0.9 | Eastern and Southern Africa |
| MDG | 2018 | Madagascar | 67 | 11 | -1.1 | Eastern and Southern Africa |
| MDV | 2017 | Maldives | 93 | 35.5 | -0.4 | South Asia |
| MHL | 2017 | Marshall Islands | 78.9 | 5.8 | -1.5 | East Asia and Pacific |
| MEX | 2019 | Mexico | 80.1 | 45.6 | -0.1 | Latin America and Caribbean |
| MNG | 2018 | Mongolia | 75.7 | 45.7 | -0.2 | East Asia and Pacific |
| MNE | 2018 | Montenegro | 90.2 | 58.2 | 0.1 | Eastern Europe and Central Asia |
| NGA | 2016 | Nigeria | 61.2 | 12.5 | -1 | West and Central Africa |
| PRY | 2016 | Paraguay | 81.9 | 20.7 | -0.8 | Latin America and Caribbean |
| SEN | 2017 | Senegal | 66.6 | 40.9 | -0.3 | West and Central Africa |
| SLE | 2017 | Sierra Leone | 51.4 | 11.4 | -1.2 | West and Central Africa |
| SUR | 2018 | Suriname | 77.4 | 25.5 | -0.7 | Latin America and Caribbean |
| THA | 2016 | Thailand | 91.1 | 66.3 | 0.3 | East Asia and Pacific |
| TMP | 2016 | Timor-Leste | 53.2 | 14.4 | -1 | East Asia and Pacific |
| TUN | 2018 | Tunisia | 82.3 | 48.6 | -0.1 | Middle East and North Africa |
| TUR | 2018 | Turkey | 73.7 | 53.9 | 0 | Eastern Europe and Central Asia |
| TKM | 2016 | Turkmenistan | 90.9 | 11.4 | -1.3 | Eastern Europe and Central Asia |
| UGA | 2016 | Uganda | 65 | 32.7 | -0.6 | Eastern and Southern Africa |
| ZWE | 2019 | Zimbabwe | 70.8 | 10.5 | -1.2 | Eastern and Southern Africa |

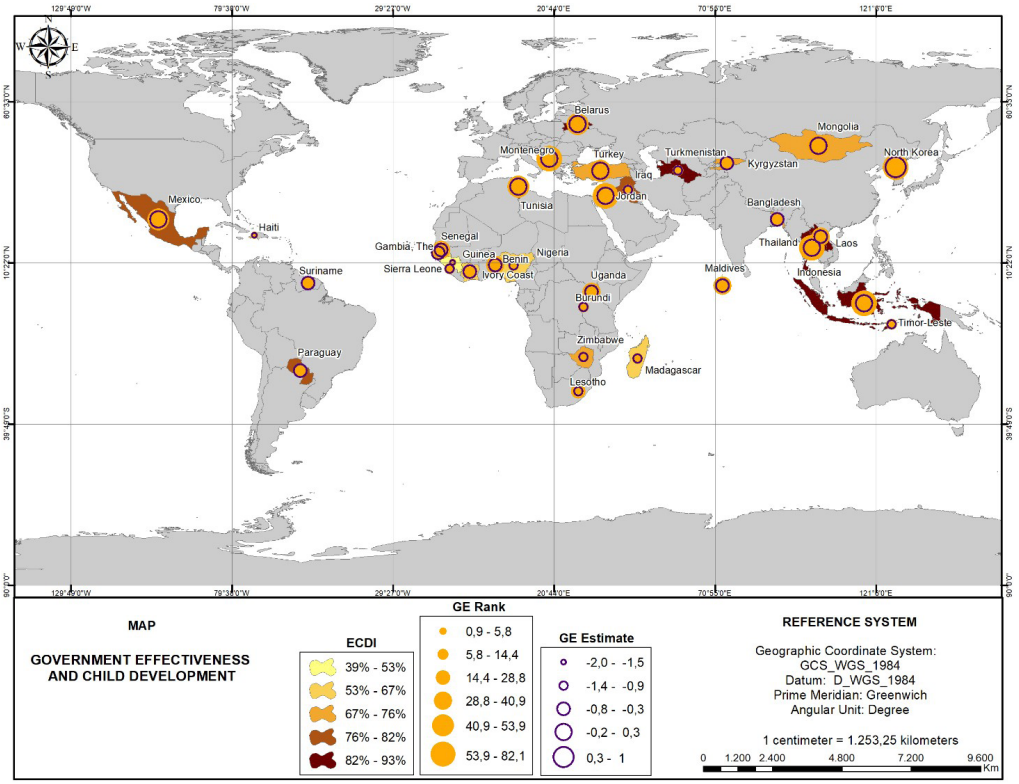


**Figure 1.** Geographical analysis ECDI, GE Rank, and GE estimate for 33 countries studied

## Correlation Analysis

The grade of correlation between ECDI and GE Estimate was calculated, this being a moderate positive correlation of (0.522, P-0.001, Correlation Spearman test), similarly to (0.518, P-0001, Pearson correlation test) (Figure 2), with the location of the studied countries in the spectrum.

Figure 3 shows the geographical correlation between the GE estimate and ECDI values; a well-defined positive correlation supports the previous correlation tests applied.

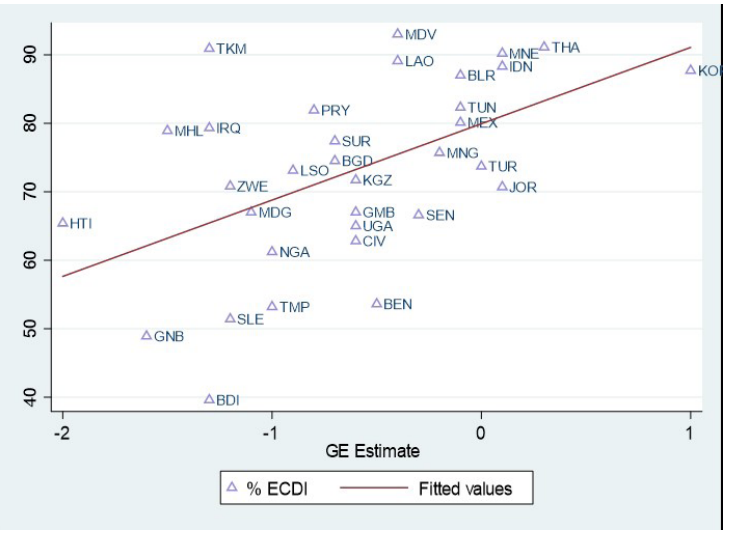


**Figure 2.** Correlation ECDI and GE estimate for studied countries

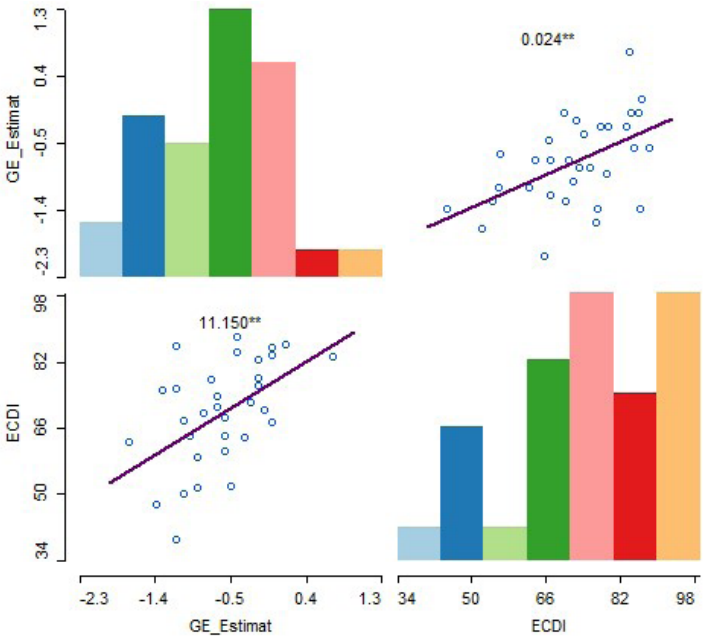


**Figure 3**. Geoda spatial representation of ECDI and GE estimate for studied countries

## Discussion

It is crucial to analyze children's early development before the onset of the COVID-19 pandemic and its relationship with the degree of effective government in each country, as a point of reference for further studies. Our study presents, to date, a comprehensive assessment of ECD and government effectiveness at the global level using national surveys. We studied 33 LMIC spread from East Asia, through Europe and Africa to Latin America and the Caribbean. We found massive variation in ECDI from Thailand (91.1%) and Turkmenistan (90.7%) to Burundi (39.6%).

The results must be interpreted considering the country's context conditions. Despite the limitations listed, the results are precious for setting global and country agendas.

The early years of life and the preschool period are the most critical time in child development to build the child's future towards healthy development[6].

According to other studies, the low development high scores were concentrated in areas of the world exposed to other risk factors ( malnutrition, micronutrient deficiency, malaria, HIV, which can lead to adverse neurodevelopmental outcomes) and low availability healthcare and educational resources such as Africa and Asia[9,18].

Despite the efforts made, it is vital to improve these unfavorable conditions as an improvement in these could also improve the development of the children; gender inequality is the leading cause of poverty and holds back progress in improving child well-being[18]. It is essential not to avoid efforts to increase the social and political protection of children and promote the welfare of countries of LMIC the contrast between many of these with some high-income countries is enormous and must be a priority to put children at the center of sustainable and equitable progress[19].

As a part of the limitations of this study, we can mention that the ECDI items used to quantify children's development were designed to be brief, to be administered within a household survey; but have some restrictions to better describe some specific subdomains of cognition and social-emotional competencies[9]. Nevertheless, the 10-item ECDI was validated by testing and iterative analyses of data collected in Jordan, the Philippines, and Kenya[15].

On the other hand, one of the strengths is a previous hypothesis of the prior studies[8] on early childhood development, which maximizes the possibility of detecting genuine relationships between the response variables and the explanatory variables[17].

Some questions about the construction of the ECDI domains could have controversy because of their high

degree of difficulty (literacy-numeracy domain) or their simplicity (physical domain). However, it is essential to mention that the ECDI must be interpreted as a general guide that aims to assess children's development for decision policymakers and programs. Still, the ECD is the result of multiple factors that interact. Added to the brief nature of the surveys, it is too much to ask for complete radiography of development. Nevertheless, we reiterate it is advantageous. The index is best interpreted within the context of other variables related to support for early childhood development in the home and community[19].

To date, the ECDI is an optimal measure of child development available for LMIC, covering many countries to guide policies and strategies. However, given all the limitations already exposed.

It is worth noting that several internal political processes of many countries in recent decades have added adverse circumstances to family dynamics, such as the forced migrations that have increased that could influence families and have weight in the inadequate developmental children's goals. Only have access to pre-primary education; in low-income countries, just one in five children has access to preschool, and one in 200 children in the world is displaced, affecting their development. These displacements of families are from country to country and internally between regions, in alarming numbers of thousands to millions, as in the case of Colombia, Mexico, Central America, some African countries, and the Middle East.

The impact on child development due to the pandemic is uncertain. Some studies consider older age groups to study, but the evidence is still minimal for 3 to 5 years. We trust our findings can contribute to the spatial understanding of the child development relationship and the effectiveness of governments to promote actions that favor barriers to the correct development of children during and after the pandemic.

## Conclusions

With the most up-to-date data reported by countries, it is possible to establish the level of child development before 2019, the year in which the COVID-19 pandemic began. Studies must be carried out during and after the pandemic to develop the direct and indirect damage that children receive in the dimensions of development, in which the government response is decisive.

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## Conflict of interests

We declare no competing interests.

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