

Research Article

Infant Mortality in the Central African Region: A Time Trend Descriptive Analysis

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Abstract

Background: The infant mortality rate (IMR) represents a pertinent indicator of a country's wellbeing, given its relation with different determinants, such as public health policies, socioeconomic conditions, maternal health, quality and access to medical services. The objective of this review was to assess the trend of infant mortality rate in the 2007-2017 period of the Central African Region member states.

Methods: Data on infant mortality rates was extracted from 2007 to 2017 (A 10 year review) using the United Nations Inter-agency Group for Child Mortality Estimation (IGME) database. We focused on the UN IGME data base as it empirically outlines IMR data

based on a comprehensive database; compiled from censuses, vital statistics systems and surveys. In addition to the UN IGME database, we used the Boolean strategy to search through PubMed and other databases for relevant articles to support the findings.

Results: Our results indicate that in the 2007-2017 period, the IMRs for Central Africa member states showed downward trends. Several reasons may explain the overall downward trend recorded in the whole Central Africa and its countries. We observed the highest rates of infant mortality in the Central African Republic and lowest in Sao Tome and Principe.

Conclusion: The review highlights two important findings: first, to date, little emphasis has been placed on developing robust mortality estimates for pediatric populations in Central Africa. Secondly, IMR were higher for the Central African region countries in almost all years compared to the SGD Goal 3.2, although the trend dropped equally from 2007 to 2017. Central African member States need to set their own targets and develop specific strategies to reduce infant mortality and monitor their progress towards the reduction. Accelerating progress is essential in all Central African countries, to achieve the Sustainable Development Goal (SDG) target of under-five mortality by the year 2030. Furthermore, achieving this SDG target would enhance the reduction of the number of under-5 deaths by 10 million between now and 2030.

Keywords: Infant Mortality Rate; Trend; Central Africa; Sustainable Development Goal

1. Introduction

The infant mortality rate (IMR) represents a pertinent indicator of a country's wellbeing, given its relation with diverse determinants, such as public health policies, socioeconomic conditions, maternal health, quality and access to medical services [1]. According to the World Health Organization (WHO), IMR represents the number of deaths of children under 1 year of age per 1,000 live births [1]. Globally, infant mortality has declined steadily in the past decades, except in the region of sub-Saharan Africa [2], of which Central African countries are found. The risk involved in a child dying before completing the 1st year of age is highest in the African Region (that is 51 per 1000 live births as per WHO), over 6 times higher than that in the European Region (8 per 1000 live births as per WHO) [1, 3]. Thus the question remains, why such discrepancies between WHO regions? Anyways, it is worthy to note that, Infant mortality is often used as a

pertinent indicator to measure the health and well-being of Countries [4]. Sub-Saharan Africa (SSA) records half of the ten million children who die annually [3, 5] worldwide. In the community, infant mortality rate is widely accepted as one of the most useful single measure of health status [6]. Despite the strategies being put in place to reduce infant mortality in Africa and particularly in the Central African region, a handful of children still die before their 1st birthday [7]. IMR is associated with a variety of several determinants and most especially, to child care levels. Moreover, experts affirmed that congenital problems, infectious diseases, poverty, inadequate health care as well as injuries are the root causal factors of infant mortality [8]. The WHO revealed that in low and middle income countries with high mortality rates, poor hygiene and sanitation, unsafe water and smoke from solid fuels are among the high ranking causal factor of mortality [9]. This is the case of Central African countries which are amongst worldwide nations with the highest mortality rates for children under the age of five [10].

It is of concern notwithstanding the commitment of the United Nations Children's Fund (UNICEF) and other donors; the Central African sub-region still bears the brunt of infant mortality [11]. The aim of this study was to assess the trend of the infant mortality rate from 2007-2017 (A 10 year's trend). This is such that, based on these obtained secondary data of IMR and its components for the Central African region, we then compared with the Sustainable development goal 3 of United Nations (SDG Goal 3 which is to end preventable deaths of newborns and under-5 children by 2030 and there are two targets: Reduce newborn mortality to at least as low as 12 per 1000 live births in every country; and reduce under-five mortality to at least as low as 25 per 1000 live births in every country) to see where we are [11].

1.1 Definition of operational terms

Infant: An infant is a child under one year of age.

Mortality: Mortality is the number of deaths within a particular society and within a particular period of time.

Infant mortality: Infant mortality is the number of deaths of children under one year of age.

2. Methods

Our review team comprised of experts in Maternal and Child Health, Epidemiology and Control of Infectious Diseases, and systematic reviews methodology. The research design that was applied to this study was a review of the available evidence on infant mortality rates in Central African Countries. We used data from infant mortality rates from the 10 member states of the Central African region for the 2007---2017 period extracted from the database generated by the UN Inter-agency Group for Child Mortality Estimation (UN IGME) in 2018. Our expectation was to combine data of all studies on infant mortality rates in the Central African states and observe trends and extend of uniformity in the available results.

2.1 Search strategy

We initially conducted a scoping search done to identify existing reviews on infant mortality rates in Central Africa, and this permitted us to further highlight relevant search terms and clarify inclusion and exclusion criteria as well as to avoid duplication in efforts. For this review, we focused on the UN IGME data base as it empirically outlines IMR data based on a comprehensive database; compiled from censuses, vital statistics systems and surveys [12] which is systematic analysis of mortality of children younger than 5 years. We decided to start our search in 2007 to 2017 in order to depict wider trend of infant mortality in the Central African region. In addition to the UN Inter-agency Group for Child Mortality Estimation database, we used

the Boolean strategy to search through PubMed and other databases for relevant articles to support the findings. In developing countries, including Central African states, vital statistics systems and civil registration have been shown not to be sufficiently complete in providing accurate and timely child mortality rates. A combination of free text terms and Medical Subject Headings (MeSH) were used to search through these databases using the following key words; *“Infant Mortality”, “Infant Mortality rate”, “Trend”, “Control”, “Prevention”, “Sustainable Development Goals”, “Indicators”, And combined with “Central Africa”, or “Economic Community of Central African States (ECCAS)”, or “Gabon”, “Cameroon”, or “Central African Republic (CAR)”, or “Chad”, or “Congo Brazzaville”, or “Equatorial Guinea”, or “Burundi”, or “Rwanda”, or the “Democratic Republic of Congo (DRC)”, or “Sao Tome and Principe”.*

After finding relevant databases for research in the region, we came across UN Inter-agency Group for Child Mortality Estimation database which was what basically provided us with the key information we needed to sort out for this review. Finally, we manually combed through bibliographies and performed hand searching of key journals on the topic. The most recent comprehensive search for each database was August 29th 2019, and all relevant studies were exported to Zotero bibliographic software.

2.2 Eligibility criteria

According to our study design and the research topic, we established predefined criteria for study retention in the review as follows;

2.2.1 Study content: All published research articles, civil registration and vital statistics systems, focusing on Infant Mortality rates.

2.2.2 Timeframe: Papers were eligible if published between 2007-2017.

2.2.3 Context: We sought studies carried out in any of the 10 Central African Countries which include; Cameroon, Central African Republic (CAR), Congo Brazzaville Gabon, Chad, Equatorial Guinea, Burundi, Democratic Republic of Congo (DRC), Rwanda and Sao Tome and Principe.

2.2.4 Study design: Surveys, censuses, vital statistics systems and surveillance studies.

2.2.5 Population: Pediatric populations.

2.2.6 Setting: Community and healthcare facilities.

2.2.7 Language: English and French.

2.2.8 Studies excluded with the following characteristics: Infant mortality studies that did not focused on infant mortality rates and Studies that reported data for non- ECCAS.

2.2.9 Data screening and extraction: We first of all removed all duplicate articles that we found from the databases. We then performed an initial screening of the titles and abstracts on the basis of the eligibility criteria stated above in order to validate their selection as part of this review.

2.3 Data analysis

The extracted data was uploaded into SPSS for analysis. We collated, summarized and categorized the extracted data in order to perform appropriate analyses.

2.4 Patient and public involvement statement

Participants were not involved in the design of this study. The manuscript is based on the analysis of

secondary data of the UN Inter-agency Group for Child Mortality Estimation, which is available on a public domain.

3. Results

This descriptive analysis of infant mortality rates for the Central Africa Region showed important differences. Rates were higher for the Central African region in almost all years compared to the SGD Goal 3.2, although the trend dropped equally from 2007 to 2017. Table 1 shows the IMR for the Central African region from 2007-2017. We observed the highest rates of infant mortality in the Central African Republic and lowest in Sao Tome and Principe. As shown in Figure 1, IMR trend reveals an important decrease since 2007, although the intensity of this drop has slowed down since 2012-2013. These results suggest that national policies have led to more public health interventions, massive spread in the implementation of equipment, resources in general and, mainly, access to pharmacological therapies. Much still has to be done as there is still a gap in terms of attending the SGD goal 3.2. It is important to pinpoint that, the mortality rate of children under age 5 fell by more than half since 1990 [13] though approximately 5.9 million children under 5 died in 2015, mostly from preventable causes [1].

This is the 1st review study analyzing the trends in IMRs specifically in Central Africa based on official data. Our results indicate that in the 2007-2017 period, the overall IMR for Central Africa and for its member states showed downward decreasing trends. Several reasons may explain the overall downward trend recorded in the whole Central Africa and its countries. An important contributive determinant in the decreasing trend of IMR is the development and use of vaccines, which have been and keeps playing a key role in reducing infant mortality caused by infectious causes.

Country	Infant Mortality rate (per 1,000 live births)										
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Cameroon	76.8	74.2	71.9	69.1	66.8	64.4	62.1	60.3	58.2	56.6	55.1
Democratic Republic of Congo	91.6	89.2	87	84.8	82.5	80.4	78.3	76.1	74.1	72.1	70
Central African Republic	106.6	105.3	103.6	101.9	99.9	98	96.3	93.9	91.6	89.2	87.6
Burundi	70.5	66.4	62.6	59.2	56.1	53.1	50.5	48	45.9	44.1	42.5
Congo Brazzaville	51	48	45.6	43.6	42	40.5	39.2	38	36.9	35.8	34.7
Chad	90.4	88.7	87	85.2	83.4	81.7	80.1	78.4	76.7	75	73.4
Rwanda	56.9	52.2	48.2	44.5	40.4	37.5	35	33	31.4	30.1	28.9
Gabon	46.6	45.4	44.2	42.9	41.7	40.4	39.3	38.5	37.4	36.1	35.1
Equatorial Guinea	88.4	85.7	83	80.5	78.2	76	73.8	71.5	69.4	67.4	65.3
Sao Tome and Principe	38.8	36.9	35.2	33.5	31.9	30.5	29.2	28.1	27.1	26.1	25.2

Extracted Data Source: Estimates developed by the UN Inter-agency Group for Child Mortality Estimation (UNICEF, WHO, World Bank, UN DESA Population Division) at www.childmortality.org

Table 1: Infant Mortality rates for the Central African Region, 2007-2017.

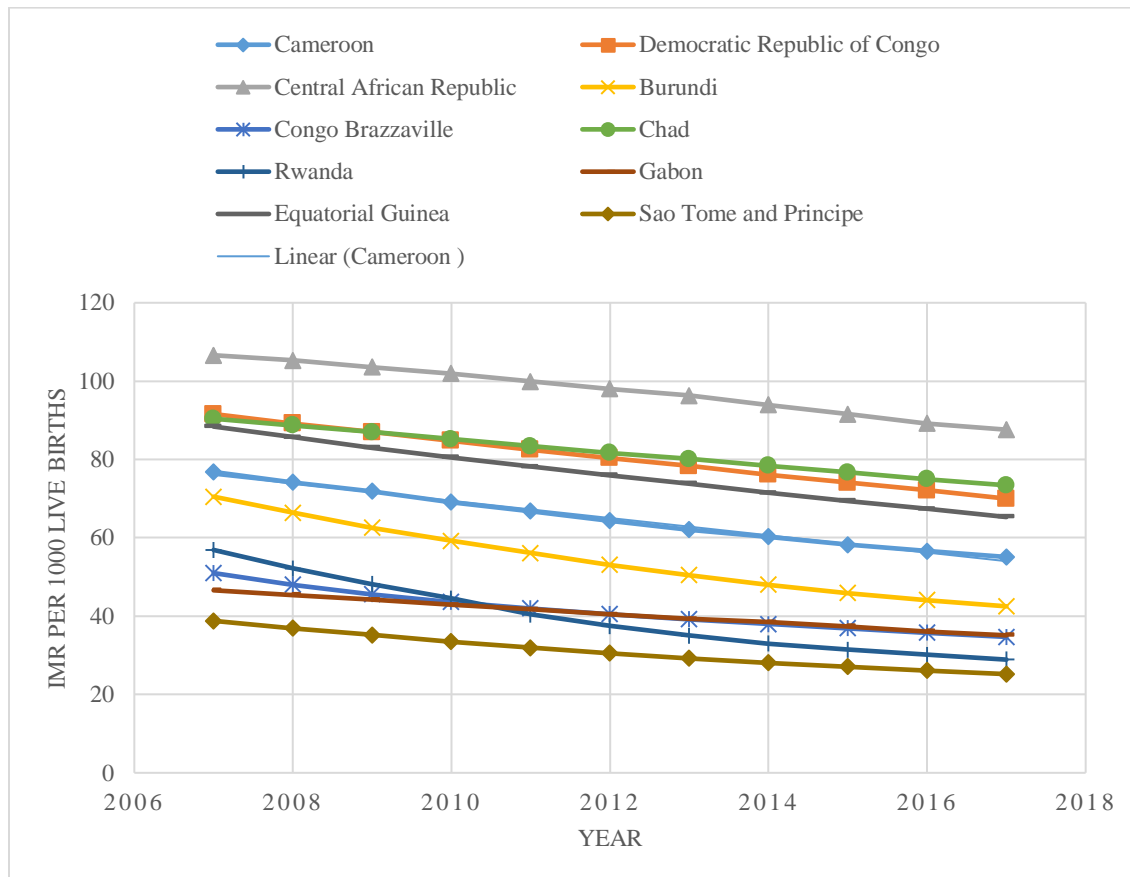


Figure 1: Trend of Infant Mortality Rates for the Central African Region member countries, 2007-2017.

4. Discussion

It is worthy to note that, in assessing this data it is necessary to bear in mind several considerations. The data have been obtained from UN Inter-agency Group for Child Mortality Estimation [12], a team made up of four different data sources: World Health Organisation, World Bank Group, United Nations Children's Fund, United Nations Development Programme and United Nations, Department of Economic and Social Affairs, Population Division. There is a limitation in the database for the fact that the information sources are based on estimates, thereby providing only a close to reality approximate of the situations in these countries. Furthermore, the lack of a great deal of this data makes the analysis less precise (though the lack of data also provides considerable information); nevertheless, the existing data provide a first step for guiding informed decision making and planning future studies.

5. Conclusion

To the best of our knowledge, this is the first study analyzing the trends in IMRs in the Central African region based on official data. The review highlights two important findings: first, to date, little emphasis has been placed on developing robust mortality estimates for pediatric populations. Also, in Central Africa, it has been established that vital statistics systems that record deaths and births on a continuous paradigm are not sufficiently complete to generate accurate mortality rates. In the absence of these vital statistics data, IMR estimates from health institutions like the WHO derived from model life tables, signify the typical patterns of mortality by age that are observed in nations with accurate data. It can be said that it is absolutely important to improve recording systems and information in Central African Region countries. Secondly, IMR were higher for the Central African region in almost all years compared to the SGD Goal 3.2, although the trend dropped equally from 2007 to 2017. The Sustainable

Development Goals (SDGs) adopted by the United Nations in 2015 were developed to promote healthy lives and well-being for all children. In addition to these overwhelming goals, Central African member States need to set their own targets and develop specific strategies to reduce child mortality and monitor their progress towards the reduction. Accelerating progress is essential in all Central African countries, to achieve the Sustainable Development Goal (SDG) target of under-five mortality by the year 2030 [11]. Bearing in mind that, meeting the SDG target 3 would reduce the number of under-5 deaths by 10 million between now and 2030. Focused interventions are still required in Africa to prevent 80% of these infant deaths. It is in this light that, we add our voices to the World Health Organization call on Member States to implement universal health coverage as a way of addressing health equity, such that all children are able to obtain essential health services without undue financial difficulties.

Declarations

Ethics Approval and Consent to Participate

Not applicable.

Consent for Publication

Not applicable.

Availability of Data and Material

Not applicable.

Competing Interests

The authors declare that they have no competing interests.

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The authors alone are responsible for the views expressed in this article, which do not necessarily

represent the views, decisions or policies of the institutions with which they are affiliated.

Author Contributions

Conceived and designed the study: FSW; Contributed in the analysis and interpretation of the data and in writing the original manuscript: FSW, DEAA; Contributed in the intellectual content of the manuscript: FSW, DEAA, EVK.

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