

# A Silent Crisis: Two Decades of Anaemia Trends among Women in the Eastern Mediterranean Region (2000–2019)

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## Keywords

prevalence, pregnant women, Region, nonpregnant women, national income

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## Abstract

### Introduction

Anaemia remains a major public health issue. This condition adversely impacts women of reproductive age, especially in low-income countries. Although there is an ongoing global effort to reduce anaemia prevalence, progress is slow and uneven. Anaemia exhibits unique patterns in the Eastern Mediterranean Region (EMR) due to this region's economic disparities and variations in access to health services. This study examined trends in anaemia prevalence among pregnant and nonpregnant women in the EMR by national income.

### Material and methods

This retrospective cross-sectional study examined anaemia prevalence among pregnant and nonpregnant women in 21 EMR countries from 2000–2019 at five-year intervals. The data on anaemia prevalence were compiled by the World Health Organization (WHO), while the World Bank provided the income classifications. Descriptive statistics were used to examine trends in prevalence and their associations with each country's income.

### Results

Although a general decrease in anaemia prevalence was observed among both pregnant and nonpregnant women, this improvement varied by income group. Pregnant women exhibited a greater reduction than nonpregnant women (-12% vs -10%). Low-income countries reported higher prevalences. The study revealed significant negative associations between national income and anaemia prevalence ( $p < 0.001$ ). While some countries demonstrated improvements, others exhibited unique or unexpected behaviours or stagnant rates.

### Conclusions

Economic differences significantly impact trends in anaemia prevalence among women of reproductive age in the EMR. Urgent, country-targeted interventions, particularly in low-income countries, are necessary to meet the WHO's goal of reducing anaemia among women of reproductive age by 50% before 2030.

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### **Methodology**

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## **Introduction**

Anaemia is widely considered a major public health problem. This condition has negative effects on health, especially among women of reproductive age (WRA) (1). The continued prevalence of anaemia generates continual cycles of morbidity and mortality all around the world (1,2). The World Health Organization defines anaemia as a haemoglobin (Hb) level of less than 12.0 g/dl for nonpregnant women and less than 11.0 g/dl for pregnant women (3). Global reports indicate that 29.9% of nonpregnant and 36.5% of pregnant women worldwide had anaemia in 2019, with low-income countries reporting the highest burden (4). **Anaemia is a multifactorial condition that has been attributed in different cases to chronic inflammation, parasitic infection, hereditary disorders, and**

deficiencies in iron, vitamin B12, and folate. Its prevalence remains excessively high in low- and lower-middle-income countries, exceeding 40% in women of reproductive age (5). Iron deficiency is considered the leading cause of anaemia. However, other causes, such as infections (e.g. malaria and helminthiasis), genetic blood disorders (e.g. thalassemia and sickle cell disease), and inadequate healthcare access, significantly increase the burden of anaemia. In addition, socioeconomic disparities, limited varieties of food, and a lack of access to prenatal care can accelerate this problem. To address these factors, it is crucial to design targeted interventions to reduce anaemia prevalence and associated health risks (5).

The complications of anaemia not only degrade individual health but also impact cognitive development, quality of life, and work productivity; they can also increase maternal and neonatal risks, including premature delivery, low birth weight, and stillbirth (6–8). Although antenatal care programmes prioritise caring for pregnant women by providing vitamin and mineral supplements as well as malaria protection drugs (9–11), nonpregnant women are not covered by these programmes. Although there is an ongoing global effort to reduce the prevalence of anaemia, progress has been slow and globally uneven globally. One notable target set by the WHO is to reduce anaemia prevalence among WRA by 50% by 2030 (following the original, failed target of 2025) (12).

The EMR is characterised by broad variation in economic status across different countries, which leads to disparities in anaemia prevalence. Many studies have examined anaemia among different populations in the EMR, noting considerable disparities in trends and prevalences. For example, researchers have reported a high burden of anaemia among pregnant women, nonpregnant women, children, and the elderly (13–17). Other research has focused on the effects of socioeconomic factors on anaemia prevalence (18–20). While

there have thus been many studies of anaemia in the EMR, most have been limited to small sample sizes or specific subpopulations. Only a few have considered the role of national income in shaping anaemia prevalence (21).

The present study helps fill these gaps by pursuing three main objectives. First, it analyses the prevalence of anaemia among pregnant and nonpregnant women aged 15–49 years in the EMR. Second, it investigates the relationships between income and anaemia prevalence and changes throughout the period 2000–2019. Finally, it compares country-specific patterns of anaemia prevalence in pregnant and nonpregnant women.

## **Materials and Methods**

This retrospective cross-sectional study consulted WHO data representing 21 countries in the EMR from 2000 to 2019. Specifically, data on WRA were extracted and classified according to pregnancy status (pregnant vs nonpregnant). The countries deemed to belong to the EMR were determined according to the WHO's classification, and the WHO also provided estimates of anaemia rates based on national surveys and modelling tools. Data on country incomes, in contrast, were taken from the World Bank's records for 2023. The methodology of this study is similar to that of our previous research (22)

### **Variables and Definitions**

In this study, anaemia was defined as a haemoglobin (Hb) level of less than 120 g/dl for nonpregnant women and less than 110 g/dl for pregnant women. Country incomes were categorised into four groups according to the 2023 classification of the World Bank: low income, lower middle income, upper middle income, and high income. This classification is

updated annually by the World Bank, but we used the most recent income classification (2024), following the usual conventions of global health studies.

Pregnancy status was determined in a binary fashion: Women were classified as either pregnant or not pregnant. Data were extracted on the period from 2000 to 2019 and aggregated into five-year intervals (2000–2005, 2005–2010, 2010–2015, and 2015–2019) to assess temporally specific trends.

### **Data Sources**

The data on anaemia prevalence that we consulted are publicly available on the WHO's website at [https://www.who.int/data/gho/data/indicators/indicator-details/GHO/anaemia-in-nonpregnant-women-prevalence-\(-\)](https://www.who.int/data/gho/data/indicators/indicator-details/GHO/anaemia-in-nonpregnant-women-prevalence-(-)) and [https://www.who.int/data/gho/data/indicators/indicator-details/GHO/prevalence-of-anaemia-in-pregnant-women-\(-\)](https://www.who.int/data/gho/data/indicators/indicator-details/GHO/prevalence-of-anaemia-in-pregnant-women-(-)). The country income classification is publicly available on the World Bank's website: <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>.

### **Analytical Phase**

The first step of the analysis involved extracting data on anaemia prevalence in the two study groups (pregnant and nonpregnant women) from the WHO's website and data on national incomes from the World Bank's website. The data on anaemia prevalence were then correlated with the information on country income. The relative and absolute changes in anaemia prevalence as well as annual reductions were calculated for the study period at 5-year intervals. We then compared the trends in anaemia prevalence among pregnant and nonpregnant women.

To conduct the statistical analysis, we used IBM SPSS v28, Microsoft Excel, and Graph Pad Prism for Windows (version 5.0, San Diego, CA; www.graphpad.com, SCR\_002798). Descriptive statistics, including means and standard deviations for continuous variables and frequencies with percentages for categorical variables, are used to summarise the data. We tested the assumption of the normality of variances using the Shapiro–Wilk test and visual inspection of a histogram. The data did not follow a normal distribution, so a nonparametric Mann–Whitney U test was used for comparisons. The Kruskal–Wallis test and analysis of variance were used to analyse the associations between anaemia prevalence and income category. Statistical significance was set at  $p < 0.05$ . These statistical methods were selected to match the distribution of the data, thereby ensuring an appropriate analysis.

### **Ethical Considerations**

The study was performed according to the principles of the Declaration of Helsinki. This study used publicly available, anonymous data and thus did not require formal ethical approval.

## **Results**

### **Anaemia Prevalence: Trends from 2000–2019**

Our analysis revealed notable trends and shifts in the prevalence of anaemia among pregnant and nonpregnant women aged 15–49 years in 21 EMR countries between 2000 and 2019. The prevalence of anaemia in both pregnant and nonpregnant women decreased overall throughout the study period. In pregnant women, the average prevalence decreased from 37.6% in 2000 to 33.0% in 2019. This decline marks an absolute change of -4.6 points

and a 12% relative reduction. The mean prevalence among nonpregnant women decreased from 36.7% in 2000 to 33.1% in 2019. This marks an absolute change of -3.6 points and a 10% relative drop (Table 1).

Reductions in anaemia throughout the EMR have not been consistent over the past two decades. The greatest decline in prevalence among pregnant and nonpregnant women occurred between 2000 and 2010. The prevalence of anaemia decreased only slightly over the second decade (Table 1). Although there were reductions in both study groups, the change among nonpregnant women was consistently higher than that in pregnant women (-12% versus -10%). Furthermore, anaemia prevalence was consistently higher in low-income countries (Figure1) than in high-income countries (Figure2).

### **Prevalence of Anaemia by National Income**

The greatest anaemia burden was reported by low-income countries. In 2000, the mean prevalence of anaemia among both pregnant and nonpregnant women exceeded 45%. By 2019, the prevalence had decreased by 9% in pregnant women and 5% in nonpregnant women (Table 1). Conversely, countries with higher incomes reported a lower anaemic burden. In 2000, the average prevalence was 31.8% in pregnant women and 32.1% in nonpregnant women. By 2019, the prevalence had decreased by 13% in both pregnant and nonpregnant women (Table 1).

Upper-middle-income countries reported varying rates of improvement (Figure3). From 2000 to 2019, Iraq reported -23% and -28% changes for pregnant (Table 3) and nonpregnant women, respectively (Table 4). In the same income group, Libya reported a -9% relative change in pregnant women (Table 3) and a -8% relative change in nonpregnant women (Table 4). Lower-middle-income countries exhibited a variety of patterns (Figure4).



For example, both Djibouti and Egypt experienced relative changes of -13% in pregnant women and -21% in nonpregnant women over the research period. Jordan reported a relative change of 2% in pregnant women and 26% in nonpregnant women (Tables 3, 4).

This analysis revealed a strong inverse association between the prevalence of anaemia and country income among both pregnant and nonpregnant women for the entire study period (2000–2019) ( $p = 0.001$ ) (Table 2). When individual time points were examined, the same substantial inverse correlation was observed most of the time. In pregnant women, a considerable gap between anaemia prevalence and country income group persisted across all time points analysed ( $p = 0.015, 0.014, 0.028, 0.018, \text{ and } 0.029$  for 2000, 2005, 2010, and 2019, respectively). In nonpregnant women, a similar gap was found at most time intervals ( $p = 0.030, 0.017, \text{ and } 0.017$  for 2010, 2015, and 2019, respectively), with marginal insignificant correlations observed in 2000 and 2005 ( $p = 0.108 \text{ and } 0.07$ , respectively) (Table 2).

### **Country-Specific Patterns by Pregnancy Status**

Our comparative analysis revealed notable country-specific patterns and differences. In 2000, the average prevalence of anaemia among pregnant women was 37.6%, compared to 36.6% among nonpregnant women, and by 2019, this prevalence had dropped to 33.0% for pregnant women and 33.1% for nonpregnant women (Figure 5). During the study period, the relative change was -12% for pregnant women and -10% for nonpregnant women (Table 1).

In low-income countries (Figure 1), the two study groups had consistently high anaemia rates. In Yemen and Somalia, pregnant women had a 50% prevalence, yet in 2019, the relative changes were only -4% and -5%, respectively, indicating minimal progress

(Table 3). Nonpregnant individuals in Yemen reported an approximately 60% prevalence, while Somalia's was approximately 40% (Table 4).

Iraq and Oman exhibited the most remarkable improvement. From 2000 to 2019, Iraq saw relative changes of -23% for pregnant women and -28% for nonpregnant women. Oman achieved relative changes of -21% for pregnant women and -23% for nonpregnant women (Tables 3, 4). Jordan demonstrated a pattern of stagnation, with the prevalence of anaemia among pregnant women shifting from 33.2% in 2000 to 33.7% in 2019 – a 2% increase – while the prevalence among nonpregnant women increased from 30.2% to 38%. A similar example is Pakistan, which saw a rise in the prevalence of anaemia among nonpregnant women (39.8 in 2000 to 41.1 in 2019), whereas the prevalence among pregnant women decreased (from 48.5% in 2000 to 44%).

Although high-income countries maintained low prevalences, an unexpected pattern was noted (Figure 2). The United Arab Emirates made no progress in reducing anaemia among nonpregnant women (24.3% between 2000 and 2019), while in Kuwait, the prevalence among pregnant women decreased from 25.4% in 2000 to 23.7% in 2019.

Afghanistan, a low-income country, demonstrated a unique pattern (Figure 1), with a significant drop in anaemia (18%) among pregnant women between 2000 and 2019 (44.4% to 36.5%). The same country saw a 26% increase among nonpregnant women, from 34.2% in 2000 to 43.2% in 2019 (Tables 3, 4). This trend was also observed in Lebanon, a lower-middle-income country (Figure 4), where the prevalence decreased among pregnant women but increased by 7% among nonpregnant women (Table 4).

## Discussion

This study examined the prevalence of anaemia and changes therein among pregnant and nonpregnant women in 21 EMR countries from 2000 to 2019, noting associations between prevalence and national income. Our research indicates a general improvement in anaemia rates among both study populations over the study period, even though the prevalence of anaemia remains high, particularly in low-income nations. The drop in prevalence was more evident in the first decade (2000–2010), whereas the second decade witnessed stagnation – particularly in low-income nations, where pregnant women underwent a greater relative reduction than nonpregnant women. This result is consistent with earlier research, which indicated a decrease in anaemia prevalence during this period (5,21).

Many factors may have contributed to the stagnation in the second decade, including decreases in global health interventions pertinent to anaemia, in the implementation of food fortification programmes, in the supplementation of food with iron and folic acid, and in the administration of malaria control programmes (23,24). The consistently observed gap between prevalences in pregnant and nonpregnant women warrants further exploration, as this may point to physiological and dietary differences between the two study groups (25–27). It could also indicate disparities in healthcare access between these groups.

This research revealed a substantial inverse relationship between national income and anaemia prevalence ( $p < 0.001$ ). Low-income countries have a higher prevalence of anaemia (28–30). In 2000, the mean prevalence of anaemia in both groups exceeded 45%. Although these countries reported some progress, after two decades, they achieved a

relative change of less than -10% for both pregnant and nonpregnant women. High-income countries achieved greater anaemia reductions in both groups by 2019.

This indicates the crucial role of socioeconomic status in determining health (5,31,32). Low-income countries face many challenges in this respect, such as food supply insecurity, poor healthcare for women, limited access to nourishing food, and insufficient infrastructure for health services (33–35). On the other hand, high-income countries provide strong healthcare services, an adequate food supply, and extensive anaemia prevention efforts (36,36–38). These disparities warrant urgent and targeted interventions to reduce anaemia rates.

This study reveals significant gaps between economic groups. For example, among the upper-middle-income class, Iraq reported a significant drop in anaemia prevalence among both pregnant and nonpregnant women, indicating a positive effort to enhance health services. In the same income class, however, Libya achieved a smaller reduction in both groups. This may reflect sociopolitical instability in Libya during the study period (39,40). These disparities also characterised lower-middle-income countries. For example, Egypt reported a notable decrease in both pregnant and nonpregnant women, and this reduction was greater among pregnant women. In the same income group, Jordan saw stagnation in the prevalence of anaemia among pregnant women and a notably worse prevalence among nonpregnant women. These disparate trends may reflect differences in the provision and implementation of health service programmes (41,42).

Throughout the study period, the prevalence of anaemia in nonpregnant women was consistently higher than that in pregnant women, although this gap decreased over time. This disparity between the two groups may indicate a prioritisation of pregnant women in

health service programmes, such as antenatal care involving the provision of folic acid and iron supplements (43–45). This high prevalence of anaemia in nonpregnant women suggests that healthcare programmes should devote greater attention to these individuals. Furthermore, large-scale health strategies should be implemented, including all WRA in efforts to prevent anaemia. After all, they could become pregnant in the future.

Many nations, including Iraq, Oman, and Saudi Arabia, have achieved substantial progress in reducing anaemia prevalence. This accomplishment may be attributed to the successful strategies used to address this challenge, such as screening and treating procedures, nutrition fortification programmes, increases in nutritional diversity, and investments in antenatal care services (46–51). On the other hand, nations such as Jordan exhibit concerning trends, with anaemia frequency increasing among both pregnant (2%) and nonpregnant (26%) women. Studies have indicated that there are many important determinants of anaemia prevalence, including educational factors; limited health resources, health facilities, medical services (52–54), and access to nutritional knowledge; and folate deficiency (55).

Although the prevalence of anaemia has generally decreased in high-income nations, unexpected trends were observed in some countries. For example, the United Arab Emirates did not demonstrate any progress in reducing anaemia among nonpregnant women across the whole study period. Similarly, Kuwait reported a minimal decline in anaemia among nonpregnant women. This could indicate that anaemia rates are influenced by more than just national income. This lifestyle could also be induced by poor dietary habits, an increasing rate of obesity, chronic diseases (51,56–61), or a lack of adherence to WHO recommendations. Vitamin D and iron deficiencies have also been associated with

anaemia (62). One study reported that half of the healthy Emirati population has abnormal complete blood count values (63).

Anaemia in Afghanistan exhibits a unique pattern. Although the prevalence has decreased substantially among pregnant women in this country (-18%), there was a rise among nonpregnant women (26%). This paradoxical trend may imply improved antenatal care but limited success in dealing with anaemia concerns among nonpregnant women (64-66), as well as high incidences of poverty and food insecurity (67). We also found a study from Afghanistan that supports a link between sheep ownership and anaemia risk (68). Similarly, the prevalence decreased among pregnant women but increased among nonpregnant women.

There is an urgent need for targeted interventions to minimise anaemia. These interventions should be tailored to the relevant country's health and economic circumstances. In low-income nations, large-scale food fortification programmes have demonstrated success in reducing anaemia prevalence (69). Developing community-based food supplementation programmes and improving prenatal care can also help reduce this prevalence (70,71). In lower-middle-income countries, such as the Philippines, Tanzania, Nigeria, and India, programmes such as school-based iron supplementation and deworming have been shown to reduce anaemia (72,73). Such programmes could be used elsewhere under similar circumstances. Upper-middle-income countries, such as Malaysia, have shown success in integrating national educational strategies for anaemia prevention into broader maternal and child health initiatives, significantly diminishing anaemia rates (74). In high-income countries, where anaemia may be linked to dietary habits and chronic

disease, the focus should be on ensuring regular medical checkups, implementing educational programmes about nutritional balance, and addressing obesity-related micronutrient deficits.

### **Limitations**

This study provides important insights regarding the prevalence of anaemia in the EMR, but several limitations should be acknowledged. This study is based on WHO data, which may have been subject to bias when being collected and reported. Variation in methodologies as well as disparities between the quality of national surveys may have led to inaccuracies in the estimations of anaemia prevalence, especially in areas affected by conflict or those with limited resources. Furthermore, these data do not take into account cultural and sociodemographic data that can help assess the prevalence of anaemia, such as nutritional habits, access to health services, and treatment-seeking behaviours. Furthermore, this study does not differentiate between nutritional and non-nutritional causes of anaemia, and it does not consider the severity of the cases. The exclusion of these potential determinants may have led to an incomplete understanding of the underlying causes of trends in anaemia prevalence.

### **Conclusion**

This study emphasises the lingering burden of anaemia among pregnant and nonpregnant women in the EMR, revealing significant variations by pregnancy status and country income. Although the overall prevalence of anaemia decreased between 2000 and 2019, there were discrepancies in this progress. In particular, low-income countries lagged behind in anaemia prevention efforts.

These data emphasise the need for immediate and continuous country-specific strategies to address this concern, particularly among nonpregnant women, who consistently exhibit a higher anaemia prevalence. Implementing food fortification programmes, ensuring a continuously secure food supply, improving health services, and providing nutritional supplements are all important steps in reducing anaemia prevalence. Furthermore, the stagnation observed in some high-income nations highlights the significance of immediate monitoring and the implementation of targeted interventions to address this condition. Furthermore, the implementation of general health programmes to prevent anaemia in women of reproductive age is critical for improving women's health.

#### **Declarations**

None.

#### **Authors' Contributions**

R.E contributed to the supervision, study design, interpretation of the data analysis, and revision of the manuscript. N.K,B drafted the manuscript. E.A analysed the data and contributed to its interpretation. HQ contributed to the data interpretation and revised the manuscript. G.A contributed to the study design, interpretation of the data, and revision of the manuscript. All authors assume final responsibility for the decision to submit the article for publication.

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## Conflict of Interest

The authors declare no conflicts of interest.

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## A Silent Crisis: Two Decades of Anaemia Trends among Women in the Eastern Mediterranean Region (2000–2019)

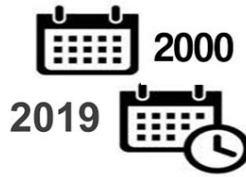


Anaemia remains a major public health issue, particularly among women of reproductive age



This study examines anaemia trends among pregnant and nonpregnant women across 21 EMR countries from 2000 to 2019, classified by national income.

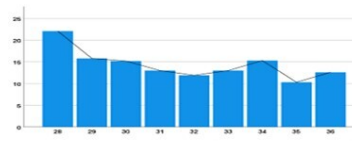
targeted interventions are needed



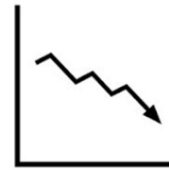
Anaemia Prevalence data



Countries income data



Low-income countries: Higher anaemia prevalence



-12% reduction



-10% reduction

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**Table 1. Mean anaemia prevalence (%) according to income class in the EMR from 2000–2019**

year	Income		Low income	Lower middle income	Upper middle income	High income	Total
2000	pregnant women	Mean	47.0	35.5	36.2	31.8	37.6
		Interval	37.2 - 50.7	29.7 - 48.5	32.2 - 40.2	25.4 - 38.4	25.4 - 50.7
	Non pregnant women	Mean	45.7	32.9	36.1	32.1	36.7
		Interval	34.2 - 67	26.4 - 39.8	32.6 - 39.5	24 - 43.7	24.0 - 67
2005	pregnant women	Mean	45.6	34.0	34.3	29.8	35.9
		Interval	35.5 - 59.1	26.1 - 48.1	30.7 - 37.8	23.4 - 36.4	23.4 - 59.1
	Non pregnant women	Mean	44.0	31.4	33.2	29.5	34.5
		Interval	34.3 - 64.9	24.5 - 41.2	30.7 - 35.7	21.1 - 40.3	21.1 - 64.9
2010	pregnant women	Mean	44.0	32.7	31.6	28.0	34.1
		Interval	33.5 - 58.3	24.3 - 47.4	29 - 34.2	22.2 - 34.7	22.2 - 58.3
	Non pregnant women	Mean	42.4	30.3	29.9	27.4	32.5
		Interval	32- 62.5	22.9 - 42.2	28.8 - 30.9	20.3 - 37	2.3 - 62.5
2015	pregnant women	Mean	43.0	32.2	30.3	27.6	33.2
		Interval	33.1 - 57.8	23.7 - 45.8	29 -31.6	23.2 - 34.1	23.2 - 57.8
	Non pregnant women	Mean	42.4	30.7	28.7	27.3	32.3
		Interval	31.8 -61.6	22.9 - 41.7	28.4 - 28.9	22.4 - 35.7	22.4 - 61.6
2019	pregnant women	Mean	42.5	31.9	30.2	27.5	33.0
		Interval	33.2 - 57.5	23.8 - 44	29.4 - 30.9	23.7 - 33.5	23.7 - 57.5
	Non pregnant women	Mean	43.3	31.7	29.2	28.1	33.1
		Interval	32.8 - 61.8	24.1 - 41.1	28.4 - 29.9	23.7 - 35.5	32.7 - 61.8
total	pregnant women	Mean	44.4	33.3	32.5	28.9	34.8
		Interval	33.1 - 59.7	23.7 - 48.5	29 - 40.2	22.2 - 38	22.2 - 59.7
	Non pregnant women	Mean	43.6	31.4	31.4	28.9	33.8
		Interval	31.8 - 67	22.9 - 42.2	28.4 - 39.5	20.3 - 43.7	20.3 - 67
pregnant women	Absolute change	-4.5	-3.6	-6.1	-4.3	-4.6	
	Relative change	-9%	-10%	-17%	-13%	-12%	
Non pregnant women	Absolute change	-2.3	-1.1	-6.9	-4.1	-3.6	
	Relative change	-5%	-3%	-19%	-13%	-10%	

**Table (2): Analysis of Anemia Prevalence by Income Groups across Different Periods Using Kruskal-Wallis H Test and ANOVA**

Prevalence of anemia in Grouping Variable: income	Prevalence of anemia in pregnant women (aged 15-49)		Prevalence of anemia in non-pregnant women (aged 15-49)	
	Test value	P-value	Test value	P-value
All	178.891	.000	163.958	.000
2000	4.673	.015	6.071	.108
2005	4.751	.014	6.976	.073
2010	9.091	.028	8.927	.030
2015	10.106	.018	10.182	.017
2019	9.004	.029	10.201	.017

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**Table 3. Anaemia among pregnant women in the EMR from 2000–2019: prevalence, absolute change, and relative change**

Location	Income	year	Prevalence%	Absolute change%	Relative change	Average annual rate of reduction (95%CI)
Afghanistan	Low income	2000	44.4	-7.9	-18%	-0.42(-0.48,-0.35)
		2019	36.5			
Bahrain	High income	2000	38	-4.5	-12%	-0.24(-0.30,-0.18)
		2019	33.5			
Djibouti	Lower middle income	2000	42.6	-5.6	-13%	-0.29(-0.42,-0.16)
		2019	37			
Egypt	Lower middle income	2000	29.9	-3.9	-13%	-0.21(-0.30,-0.11)
		2019	26			
Iran (Islamic Republic of)	Lower middle income	2000	29.8	-6	-20%	-0.32(-0.47,-0.16)
		2019	23.8			
Iraq	Upper middle income	2000	40.2	-9.3	-23%	-0.49(-0.59,-0.38)
		2019	30.9			
Jordan	Lower middle income	2000	33.2	0.5	2%	0.03(-0.10,0.15)
		2019	33.7			
Kuwait	High income	2000	25.4	-1.7	-7%	-0.09(-0.24,0.06)
		2019	23.7			
Lebanon	Lower middle income	2000	29.7	-2	-7%	-0.11(-0.18,-0.03)
		2019	27.7			
Libya	Upper middle income	2000	32.2	-2.8	-9%	-0.15(-0.25,-0.05)
		2019	29.4			
Morocco	Lower middle income	2000	36.8	-4.2	-11%	-0.22(-0.27,-0.17)
		2019	32.6			
Oman	High income	2000	38.4	-8.2	-21%	-0.43(-0.54,-0.32)
		2019	30.2			
Pakistan	Lower middle income	2000	48.5	-4.5	-9%	-0.24(-0.32,-0.15)
		2019	44			
Qatar	High income	2000	30.6	-3.9	-13%	-0.21(-0.29,-0.13)
		2019	26.7			
Saudi Arabia	High income	2000	33	-5.7	-17%	-0.30(-0.42,-0.18)
		2019	27.3			
Somalia	Low income	2000	51.2	-2.5	-5%	-0.13(-0.16,-0.10)
		2019	48.7			
Sudan	Low income	2000	42.5	-5.7	-13%	-0.30(-0.35,-0.25)
		2019	36.8			
Syrian Arab Republic	Low income	2000	37.2	-4	-11%	-0.21(-0.31,-0.11)
		2019	33.2			
Tunisia	Lower middle income	2000	33.5	-3	-9%	-0.18(-0.20,-0.11)
		2019	30.5			
	High income	2000	25.3	-1.6	-6%	

United Arab Emirates		2019	23.7			-0.08(-0.15,-0.02)
Yemen	Low income	2000	59.7	-2.2	-4%	-0.12(-0.14,-0.09)
		2019	57.5			

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**Table 4. Anaemia among nonpregnant women in the EMR from 2000–2019: prevalence, absolute change, and relative change**

Location	Income	year	Prevalence%	Absolute change%	Relative change	Average annual rate of reduction (95%CI)
Afghanistan	Low income	2000	34.2	9	26%	0.47(0.32 , 0.63)
		2019	43.2			
Bahrain	High income	2000	43.7	-8.2	-19%	-0.43(-0.57,-0.3)
		2019	35.5			
Djibouti	Lower middle income	2000	36.7	-4.6	-13%	-0.24(-0.45,-0.03)
		2019	32.1			
Egypt	Lower middle income	2000	35.9	-7.5	-21%	-0.40(-0.47,-0.32)
		2019	28.4			
Iran (Islamic Republic of)	Lower middle income	2000	27.3	-3.2	-12%	-0.17(-0.34,-0.004)
		2019	24.1			
Iraq	Upper middle income	2000	39.5	-11.1	-28%	-0.58(-0.77,-0.40)
		2019	28.4			
Jordan	Lower middle income	2000	30.2	7.8	26%	0.41(0.12,0.70)
		2019	38			
Kuwait	High income	2000	24	-0.3	-1%	-0.02(-0.25,0.22)
		2019	23.7			
Lebanon	Lower middle income	2000	26.4	1.9	7%	0.10(-0.04,0.24)
		2019	28.3			
Libya	Upper middle income	2000	32.6	-2.7	-8%	-0.14(-0.28,-0.01)
		2019	29.9			
Morocco	Lower middle income	2000	35.2	-5.4	-15%	-0.28(-0.42,-0.15)
		2019	29.8			
Oman	High income	2000	37.7	-8.6	-23%	-0.45(-0.66,-0.25)
		2019	29.1			
Pakistan	Lower middle income	2000	39.8	1.3	3%	0.06(-0.05,0.18)
		2019	41.1			
Qatar	High income	2000	31.5	-3.3	-10%	-0.17(-0.31,-0.03)
		2019	28.2			
Saudi Arabia	High income	2000	31.6	-4.1	-13%	-0.22(-0.41,-0.02)
		2019	27.5			
Somalia	Low income	2000	47.3	-4.9	-10%	-0.23(-0.33,-0.19)
		2019	42.4			
Sudan	Low income	2000	43	-6.5	-15%	-0.34(-0.48,-0.21)
		2019	36.5			
Syrian Arab Republic	Low income	2000	36.8	-4	-11%	-0.21(-0.37,-0.05)
		2019	32.8			
Tunisia	Lower middle income	2000	31.4	0.7	2%	0.04(-0.06,0.13)
		2019	32.1			
	High income	2000	24.3	0	0%	0.00(-0.10,0.10)

United Arab Emirates		2019	24.3			
Yemen	Low income	2000	67	-5.2	-8%	-0.27(-0.34,-0.16)
		2019	61.8			

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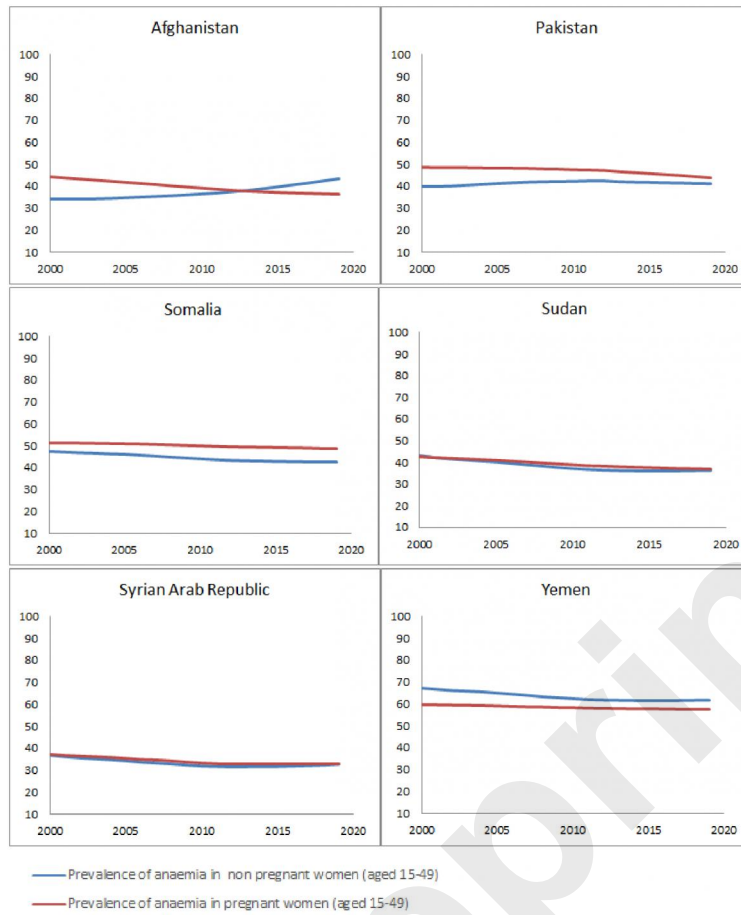


Figure 1 Anaemia prevalence among pregnant vs. nonpregnant women in low-income countries: EMR from 2000 to 2019

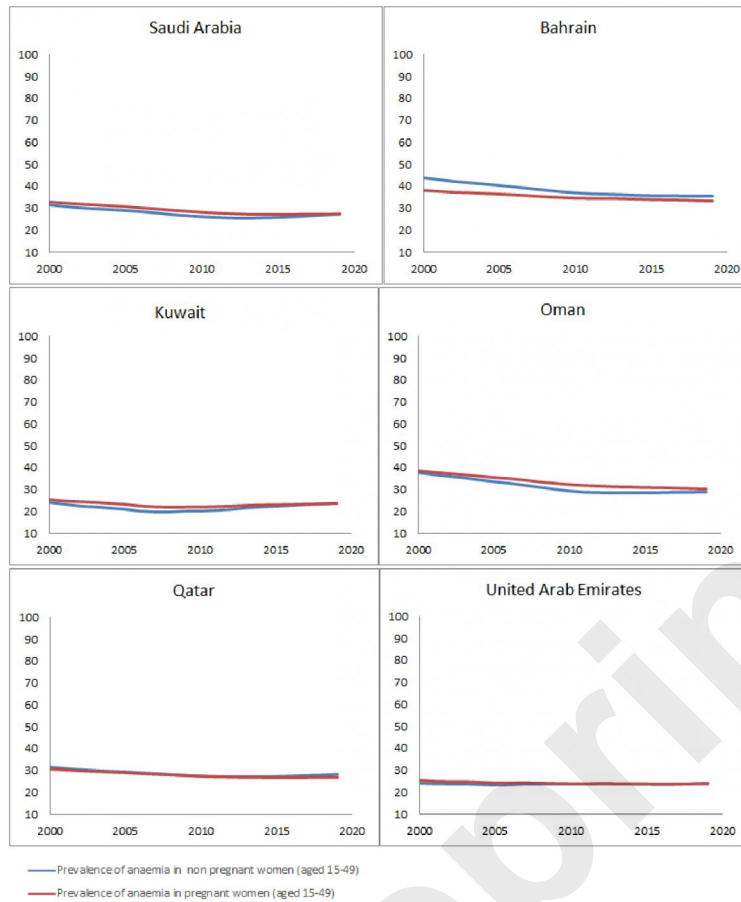


Figure 2 Anaemia prevalence among pregnant vs. nonpregnant women in high income countries : EMR from 2000 to 2019



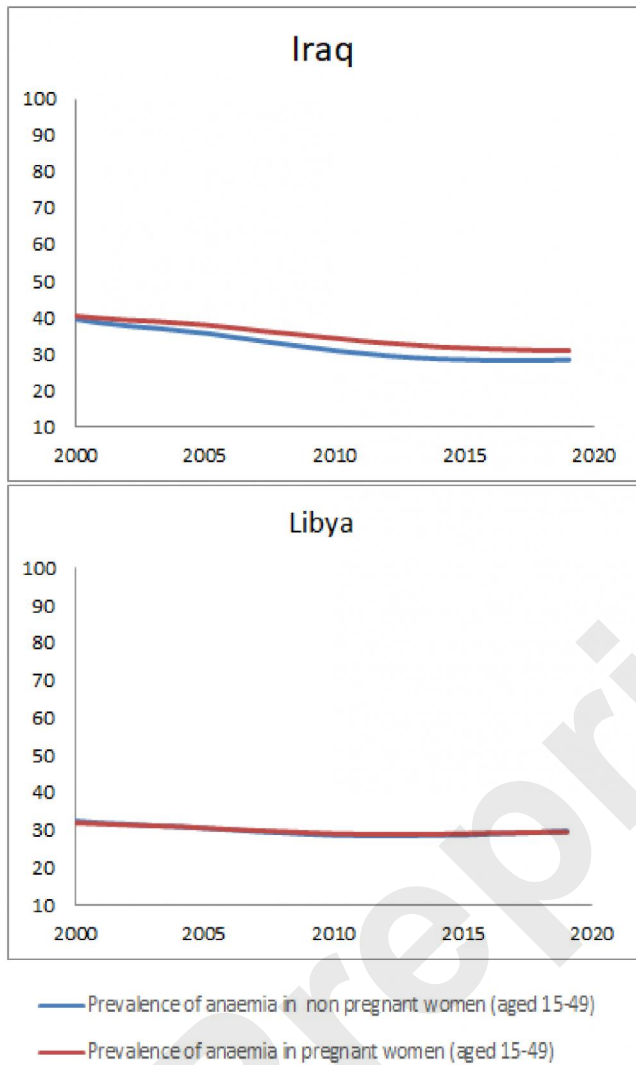


Figure 3 Anaemia prevalence among pregnant vs. nonpregnant women in upper middle income countries EMR from 2000 to 2019.

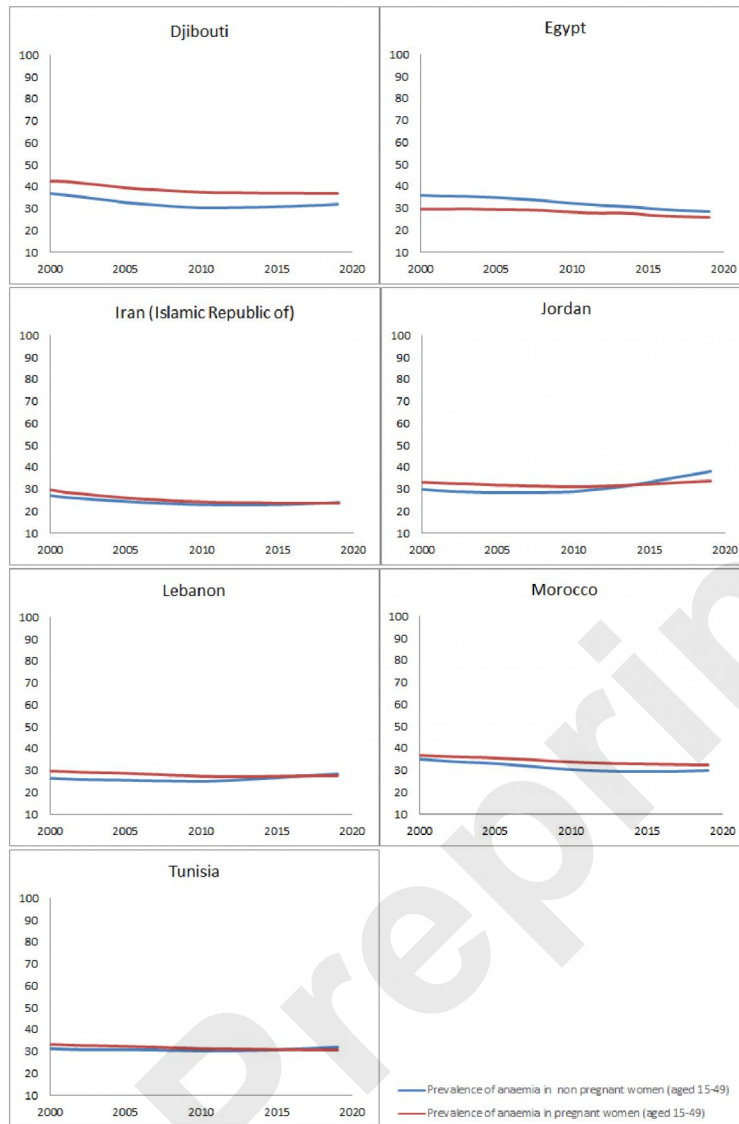


Figure 4 Anaemia prevalence among pregnant vs. nonpregnant women in lower middle income countries : EMR from 2000 to 2019

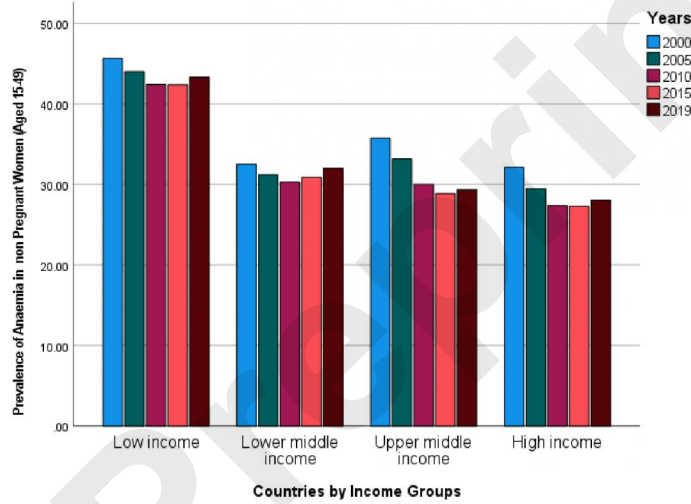
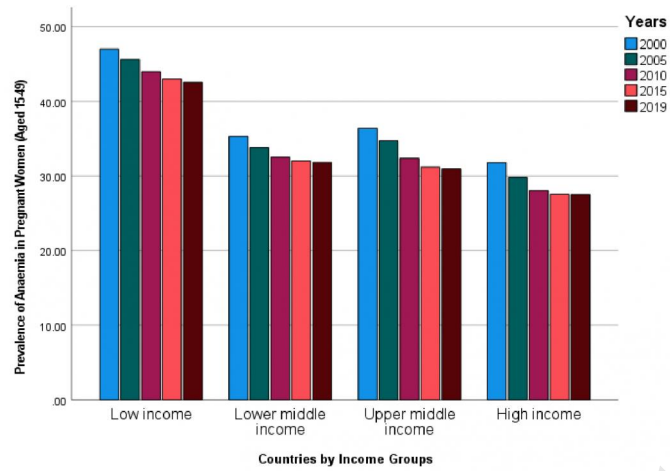


Figure 5 Trends in the prevalence of anemia among pregnant and non-pregnant women in countries in the EMR from 2000 to 2019