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The global geography of diabetes mellitus

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Abstract

Background: The seventy-five years of the existence of the International Diabetes Federation (IDF) and twenty-five years after she published the first edition of Diabetes Atlas in 2000, has witnessed tremendous benefits to the whole global international community. With the World Health Organization (WHO), both international institutions have advanced advocacy and policy implementation on Diabetes Mellitus (DM) in all IDF regions and most countries of the world. **Objective:** The aim of this review is to use the current edition (11th Edition 2025) of the IDF Diabetes Atlas to highlight some regional peculiarities of diabetes mellitus in the seven IDF regions. The enormous economic impact of diabetes mellitus in all the regions is stressed. The mortality trends in 2024 are expressed in the tables. **Method:** A detailed study of the IDF, 11th edition 2025 Diabetes Atlas is done as a follow-up to all the previous ten editions since 2000. The World Health Organization (WHO), classification of diabetes mellitus 2019 also provided clarity on many aspects of Diabetes Mellitus. **Conclusion:** The growing prevalence of diabetes mellitus since the turn of the century globally is clearly established. The classification of diabetes mellitus has been in a state of flux. However, the knowledge gap has been significantly narrowed. IDF diabetes atlas provides easy reference and summative information on national data on diabetes mellitus of most countries of the world.

Keywords: *IDF, WHO, Diabetes atlas, Geography, Regions and countries*

1. Introduction

Aretaeus the Cappadocian used the word 'Diabetes' in the 2nd century AD to describe polyuria with associated thirst and emaciation as features of this fatal disease (Major, 1945; Von Mering and Minkowski, 1889). In the 5th century, Susrutha in India referred to diabetes mellitus as 'Honey Urine'. In 1679, Willis wrote, 'those laboring under this disease piss a great deal more than they drink. This urine is wonderfully sweet as if it were imbued with honey or sugar' (Major, 1945; Von Mering and Minkowski, 1889). In 1815, the famous French Chemist, Chereul discovered that the sugar in diabetic urine was glucose. In 1889, Minkowski and Von

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Mering in Germany showed that complete pancreatectomy in dogs produced a condition that corresponded to severe diabetes mellitus in man (Von Mering and Minkowski, 1889).

In 1921, Dr. Fredrick Banting and Charles Best of the University of Toronto, Canada prepared insulin in a form effective in overcoming experimental diabetes mellitus in pancreatectomized dogs. This marked the beginning of the era of modern diabetes therapy (Levine, 1989; Luft, 1989). This was done under the supervision of Dr. John MacLeod. North America and Caribbean (NAC) region is made up of 25 countries: United States of America, Canada, Mexico and 22 Caribbean countries (IDF, 2025). My President, Bola Ahmed Tinubu just returned from Saint Lucia in the last week of June 2025. The country summary in IDF NAC showed that Saint Lucia has a population of less than 200,000 people and had an adult diabetes prevalence of 11.3% (IDF, 2025). She has no record of Type 1 Diabetes Mellitus (T1DM).

The International Diabetes Federation (IDF) is 75 years: 1950 to 2025. The first president of IDF, Dr. RD Lawrence was a British Diabetologist. The current IDF president is Professor Peter Schwarz (2024-2027). The IDF president for 2022-2024, Professor Akhtar Hussain died on July 1, 2024 before the end of his tenure. The IDF Diabetes Atlas 2025 was launched on World Diabetes Congress 2025 in Bangkok. After fifty years of IDF, she published the first edition of Diabetes Atlas in 2000. The IDF Diabetes Atlas has grown over the years as a valuable research material and advocacy tool with clear evidence of the growing impact of diabetes in all countries and regions (IDF, 2025; Oputa and Oputa, 2024; WHO, 2019; International Diabetes Federation, 2021).

2. The regions of international diabetes federation

The IDF covers the entire earth under seven regions as in Figure 1 and Tables 1 and 2. The seven regions are made up of 218 countries. The seven regions are:

1. **Middle East and North Africa (MENA):** This has 21 countries.
2. **North America and Caribbean (NAC):** This region is made of United States of America, Canada, Mexico and 22 Caribbean countries.
3. **Western Pacific (WP):** Has 37 countries which includes China, Australia, Indonesia, Japan, Republic of Korea, Malaysia and Philippines.
4. **South East Asia (SEA):** This region has only seven countries: India, Bangladesh, Bhutan, Maldives, Mauritius, Nepal and Sri Lanka.
5. **South and Central America (SACA):** This region has 19 countries that include—Argentina, Brazil, Chile, Colombia, Cuba, Costa Rica, Nicaragua, Panama, Paraguay, Peru and Puerto Rico.
6. **Europe (EUR):** This has the largest number of countries, 60 countries. Russian Federation and Israel are part of this region.
7. **Africa (AFR):** Africa has 49 countries. Nigeria has the largest population in this region.

MENA: This region has 21 countries: six are from North Africa and fifteen from Middle East. The African countries are Algeria, Egypt, Libya, Morocco, Sudan and Tunisia. The countries of Middle East are Afghanistan, Bahrain, Iraq, Iran, Jordan, Kuwait, Lebanon, Oman, Pakistan, Qatar, Saudi Arabia, State of Pakistan, Syrian Arab Republic, United Arab Emirate and Yemen.

This region has the highest regional diabetes prevalence, 17.6% in 2024. The global adult population with diabetes mellitus in 2024 was 589 million, of which 85 million are from this region (14.4%). It has the third highest population with Type 1 Diabetes Mellitus, 1.4 million. One in three living with diabetes are undiagnosed. One in five live births are affected by Hyperglycemia in Pregnancy (HIP). The health expenditure in 2024 was only 3.4% of the global expenditure on diabetes, which was 35 billion USD.

NAC: This region has 25 countries made up of United States of America (USA), Canada, Mexico and 22 Caribbean countries. This region has the second highest diabetes prevalence of 15.1%. In all, 56 million in this region had diabetes in 2024: USA had 39 million, Mexico 14 million, Canada 2.8 million, Haiti 0.542 million, and Jamaica 0.236 million. One in seven adults had diabetes, while one in three living with diabetes were undiagnosed.

It has the second highest number with Type 1 Diabetes Mellitus, 1.9 million. One in four live births were complicated by Hyperglycemia in Pregnancy: this was the second largest of all the seven regions. It had the highest population of diabetes-related mortality, 21.4%. Good enough it has the highest diabetes-related expenditure of 439 billion USD, 43% of the total global expenditure. This also translates to the highest average cost per person with diabetes (7,811 USD).

WP: This region is made up of 37 countries which includes China and Japan. China had the largest population in the world in 2024, 1.408 billion people. China has one in four of all adults living with diabetes globally. The population of Japan in 2024 was 123.7 million. The WP region had the third highest prevalence of diabetes mellitus, 12.4%. It has the highest number of people living with diabetes – 215 million people – 37.0% of the global cases of diabetes mellitus. One in two cases of diabetes in this region was undiagnosed. One in five live births were complicated by HIP in 2024. The highest number of deaths occurred in this region in 2024, 1.2 million. The diabetes-related expenditure was 246 billion USD, which was 24% of the total global expenditure on diabetes.

SEA: Only seven countries make up the South East Asia region. India alone had a population of 1.45 billion people in 2024. Other countries population were Bangladesh 177.8 million, Nepal 31.07 million, Sri Lanka 22.0 million, Mauritius 1.3 million, Bhutan 0.79 million, and Maldives 0.53 million. The total population of these six countries was 233.5 million which was 17% of India's population. India had 90 million of the 107 million cases of diabetes from this region.

The prevalence of diabetes in this region was 9.7% in 2024, with 107 million people that live with diabetes. This was the second largest and 18.2% of the global total of people with diabetes mellitus. It accounts for one in seven of all adults living with diabetes worldwide. The region has the third highest cases of undiagnosed diabetes, 42.7%. One in three live births were complicated by HIP which was the highest, 31.2%. One million had Type 1 diabetes mellitus. The deaths in 2024 in this region was 374,000. The region with the Africa region had the least health expenditure on diabetes, 12 billion USD, only 1% of the total global heath expenditure.

SACA: The SACA IDF region has 19 countries. The adult population of the population aged 20-79 years in 2024 was 355 million. The diabetes prevalence in the region was 10.0%, which makes 35.4 million people. The highest of 17.0 million of the 35.4 million is from Brazil. Argentina accounted for 4.3 million, Colombia 3.0 million, Chile 1.9 million and Venezuela 1.6 million. One in three adults with diabetes were undiagnosed, 30.4%. One in six live births were complicated by HIP. The number with Type 1 diabetes mellitus was 797,000 people. The number of deaths in 2024 in this region was 224,000. The diabetes-related health expenditure was 81 billion USD, 8% of the total global expenditure.

EUR: The European region has the highest number of countries, 60. The adult population (20-79 years) in 2024 was 672 million. One in ten adults had diabetes, which was 66 million. The prevalence was 9.8%. The number of people with diabetes in five countries were: Spain 14.7 million, Turkey 9.6 million, Russia Federation 7.6 million, Germany 6.5 million, and Italy 5.0 million. One in three diabetics were undiagnosed (33.6%). This region had the highest number of Type 1 diabetes mellitus, 2.7 million. One in seven live births had HIP, 14.2% of the live births of 1.5 million. The diabetes-related expenditure was 193 billion USD, which was 19% of the total global expenditure. This represents the second highest average cost per patient with diabetes, which is 2,951 USD.

AFR: Sub-Saharan Africa has 49 countries. The adult population of those aged 20-79 years was 581 million in 2024. The region has the lowest diabetes prevalence of 4.2%. This means that 25 million were diabetic in 2024. The region is made up of 11.2% of the global population with diabetes. It has the highest proportion of undiagnosed diabetes, 72.6%. Three countries in this region had the highest undiagnosed cases: Burkina Faso 90.4%, Benin 89.8% and Mozambique 88.6%. One in seven live births had HIP. It had the lowest diabetes-related health expenditure of 10 billion USD. This is only 1% of the global diabetes-related expenditure. The number of deaths was 216,000, which is one in twenty of all the cases.

The diabetes prevalence was high in the following countries: Sao Tome and Principe 12.1%, Comoros 10.8%, Zambia 10.3%, Tanzania 9.8% and Seychelles 10.1%. However, because of Nigeria's high population and prevalence of 3%, she had 3 million diabetics in 2024. The other countries are Tanzania 2.9 million, Democratic Republic of Congo (DRC) 2.9 million, South Africa 2.3 million, and Ethiopia 2.3 million.

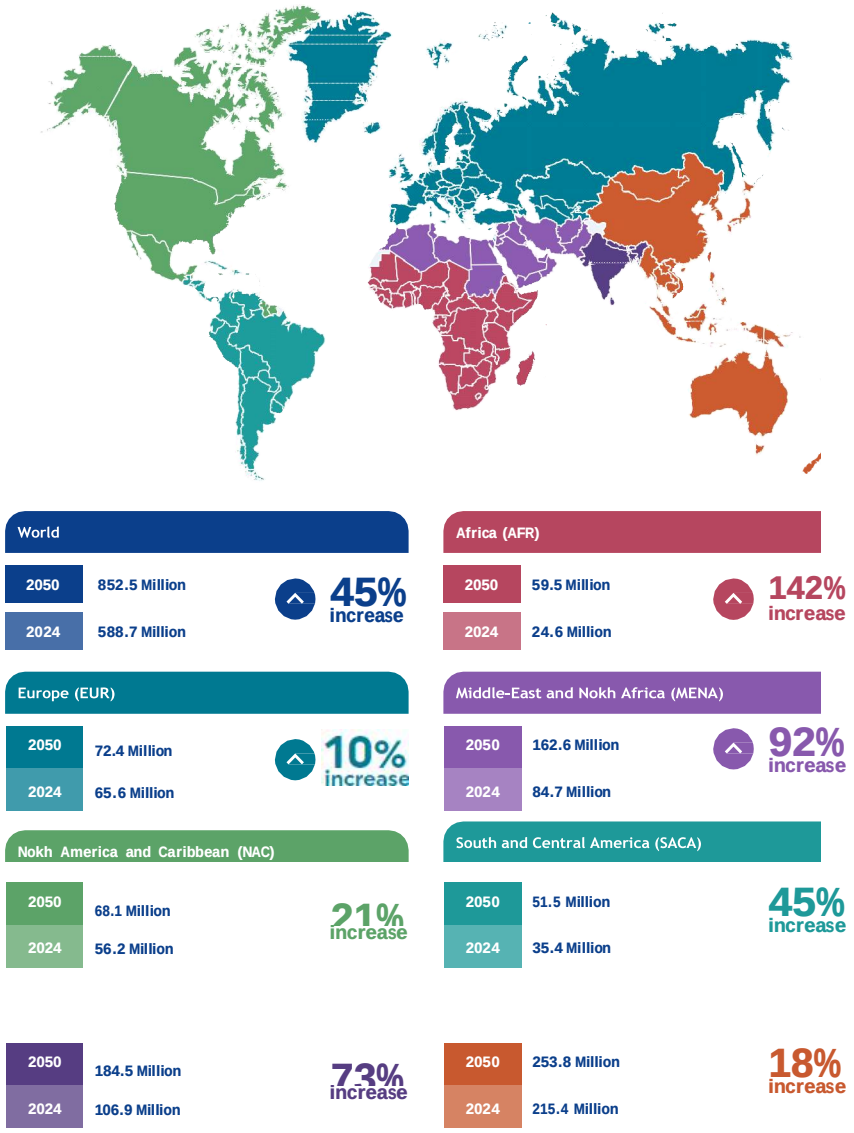

Figure 1: Diabetes prevalence by IDF regions in 2024 (Diabetes Atlas, 2025)

Table 1: The international diabetes federation regions in 2024

S/No.	World and IDF regions	Population 20-79 years	Diabetes in millions (%)	Prevalence % (comparative prevalence %)	Undiagnosed % and (millions)
1.	WORLD	5.3 billion	588.7 (100%)	11.1 (11.1)	42.8 (251.7 million)
2.	MENA	480 million	84.7 (14.4%)	17.6 (19.9)	37.2 (31.5 million)
3.	NAC	373 million	56.2 (9.6%)	15.1 (13.8)	29.1 (16.3 million)
4.	WP	1.74 billion	215.4 (37.0%)	12.4 (11.1)	50.0 (107.6 million)
5.	SEA	1.1 billion	106.9 (18.2%)	9.7 (10.8)	42.7 (45.6 million)
6.	SACA	355 million	35.4 (6.0%)	10.0 (10.1)	30.4 (10.7 million)
7.	EUR	672 million	65.6 (11.1%)	9.8 (8.0)	33.6 (22.0 million)
8.	AFR	581 million	24.6 (4.2%)	4.2 (5.0)	72.6 (17.9 million)

Note: The world population in 2024 was 8.1 Billion. The population of SEA was 1.7 Billion.

Table 2: The world and IDF regions in 2024

S/No	World and Regions (countries)	Type 1 DM (new cases)	HIP % (live births in millions)	Health expenditure in USD	Deaths (20-79 years)
1.	World (218 countries)	9.2 million (503,000)	19.7% (23 million)	1 Trillion	3.4 million
2.	MENA (21 countries)	1.4 million	19.4% (3.6 million)	35 Billion	467,000
3.	NAC (25 countries)	1.9 million	22.4% (1.4 million)	439 Billion	526,000
4.	WP (37 countries)	991,000	19.8% (4.2 million)	246 Billion	1.2 million
5.	SEA (7 countries)	1.0 million	31.2% (7.1 million)	12 Billion	374,000
6.	SACA (19 countries)	797,000	15.8% (1.0 million)	81 Billion	224,000
7.	EUR (60 countries)	2.7 million	14.2% (1.5 million)	193 Billion	433,000
8.	AFR (49 countries)	352,000	13.8% (4.7 million)	10 Billion	216,000

Note: T1DM under 20 years make up only 15% of all T1DM: that is 419,000 of 9.2 million. NAC has the highest Diabetes-related Health Expenditure, 43.2% of total, followed by WP – 24.3% and EUR – 19.0%.

3. Type 1 Diabetes Mellitus (T1DM)

This forms about 5% of all the cases of diabetes mellitus globally (Oputa and Oputa, 2024; WHO, 2019; International Diabetes Federation, 2021; NCD Risk Factors Collaboration, 2024; American Diabetes Association, 2024). In 2024, 9.15 million people lived with T1DM according to IDF (2025). The number of cases of T1DM according to regions are shown in Table 2. About 19.8% of them were less than 20 years of age, 68.6% were between 20 to 59 years old, while 11.8% were 60 years and above. The new cases of T1DM in 2024 were 503,000: 284,000 (56.5%) were older than 20 years old. The mean age of those living with T1DM was 35 years. All the seven IDF regions recorded significant preventable deaths amongst T1DM patients in 2024, a total of 160,000 deaths (EUR 34,000; AFR 31,000; SEA 30,000; MENA 27,000; NAC 18,000; WP and SACA 14,000 each) (IDF, 2025).

4. Hyperglycaemia in Pregnancy (HIP)

The total global live births in women aged 20 to 49 years in 2024 was 118.5 million. There were 23.0 million live births complicated by hyperglycaemia in pregnancy, which is 19.7% prevalence. That is to say that one out of five live births were complicated by HIP. The prevalence of HIP varied in the seven IDF regions from 13.8% in the Africa region to 31.2% in South East Asia region, the lowest and highest respectively. Table 2 gives the prevalence in the other regions. HIP is sub-divided into three groups: Gestational Diabetes Mellitus (GDM), Diabetes Mellitus before pregnancy, and Diabetes Mellitus detected in pregnancy. The highest prevalence was in the GDM group – 79.2%. DM before pregnancy was 11.0%, while DM detected in pregnancy was 9.9%.

5. Mortality from diabetes in 2024

Table 2 shows the regional mortality from diabetes mellitus in 2024. Of the 3.4 million deaths the majority occurred in those over 60 years, 2.2 million which is 63.0% of the total deaths from diabetes mellitus. Also 2.4 million of the deaths were from diabetes related death, while 1.0 million deaths were undiagnosed diabetes related cases. This diabetes related deaths represents 9.3% of the global deaths from all causes in the age group 20-79 years. However, in the NAC region the percentage of deaths from diabetes to all-cause mortality was very high, 21.4%. It was 16.7% in the MENA region and only 4.0% in the AFR region. China had the highest

number of deaths (740,000). The others are USA (360,000), India (330,000), Pakistan (230,000), Indonesia (130,000) and Mexico (120,000).

6. The economic impact of diabetes mellitus in 2024

Diabetes Mellitus contributes heavily to the economic burden of countries, people, families and health systems globally. Depending on the region, the proportion of expenditure may be private, public, government and / or out of pocket by the people living with the disease. The global expenditure on diabetes grew from 232 billion USD in 2007 to more than a trillion USD (1,015 billion) in 2024. This represents an increase of 338% in seventeen years. NAC region accounts for the greatest diabetes related expenditure, 43.3% of the 2024 global expenditure on diabetes. This is followed by the WP region which was 24.3% and EUR region utilized 19.0%. The other four regions: SACA, MENA, SEA and AFR: contributed 13.5% of the global diabetes related funds in 2024 (IDF, 2025; Gregg *et al.*, 2014; United Nations, 2022; Atun *et al.*, 2017; Walker *et al.*, 2023).

The expenditure per person also varied across the regions: NAC (7,811 USD), EUR (2,950 USD), SACA (2,417 USD), WP (1,173 USD), MENA (429 USD), AFR (414 USD) and SEA (108 USD). Diabetes related expenditure when compared with the total global health expenditure was 11.9%. This also varied amongst the regions. The regional diabetes related expenditure to the regional total expenditure were—SACA 22.0%, MENA 17.0%, WP 14.9%, NAC 11.2%, AFR 10.3%, SEA 9.7% and EUR 8.8%.

7. Conclusion

The global burden of Diabetes Mellitus is on a steady rise, with significant regional disparities in prevalence, diagnosis, mortality and economic impact. The IDF Diabetes Atlas 2025 data highlights these regional disparities across 218 countries in its seven regions, with a total estimated prevalence of 589 million people (aged 20-79 years) worldwide with Diabetes and a predicted rise to 853 million by 2050.

According to the 2025 Diabetes Atlas data, the MENA and NAC regions have the highest prevalence rates of Diabetes. The two most populous countries in the world are China and India. China has one in four of all adults living with diabetes globally (with its region having the highest percentage of people living with diabetes globally). India alone has over 90% of diabetes cases in the SEA region. The WP and NAC regions have the highest percentages of diabetes-related mortality and both regions record the highest Health Expenditures as regards Diabetes management.

Africa as a region endures the highest proportion of undiagnosed diabetes cases and the SEA region reports the highest rates of Hyperglycemia in Pregnancy (HIP). Both regions thrive in low-resource settings and have the least Health Expenditures on Diabetes. The economic toll of Diabetes, which exceeded 1 trillion USD globally in 2024 demands urgent and targeted interventions. As IDF marks 75 years, the challenge remains clear: strengthen prevention, improve early detection, and ensure accessible standard treatment and care to curb the increasing prevalence of Diabetes worldwide.

References

American Diabetes Association (2024). Diagnosis and classification of diabetes: Standards of care in diabetes. *Diabetes,* 47: 520-542.

Atun, R. *et al.* (2017). Diabetes in Sub-Saharan Africa: From clinical care to health policy. *Lancet Diabetes Endocrinol*, 5: 622-667.

Gregg, E.W. *et al.* (2014). Changes in diabetes-related complications in the United States, 1990-2010. *N Engl J Med*., 370: 1514-1523.

International Diabetes Federation (IDF) (2025). *Diabetes Atlas*, 11th Edition.

International Diabetes Federation (2021). *Diabetes Atlas*, 10th Edition.

Levine, R. (1989). Historical development of the theory of pancreatic diabetes, Oscar Minkowski. *Diabetes*, 38: 1-2.

Luft, R. (1989). Oscar Minkowski: Discovery of the pancreatic origin of diabetes. *Diabetologia,* 32: 399-401.

Major, R.H. (1945). *Classic Descriptions of Disease*, 3rd Edition, Oxford, Blackwell.

NCD Risk Factors Collaboration (NCD-Risk C). (2024). Worldwide trends in diabetes prevalence and treatment from 1990 to 2022: A pooled analysis of 108 populations-representative studies with 141 million participants. *Lancet,* 404: 2077-2093.

Oputa, R.N. and Oputa, P.U. (2024). Chronic complications of diabetes mellitus. *WAJM*, 41(8): 904-908.

United Nations. (2022). World population prospects: 2022 revision. New York.

Von Mering, J.V. and Minkowski, O. (1889). Diabetes mellitus after total pancreatectomy in dogs. *Arch Exp Pathol Pharmakol.,* 27: 371-377.

Walker, A.F. *et al.* (2023). Interventions to address global inequity in diabetes: International progress. *Lancet,* 402: 250-264.

World Health Organization (WHO). (2019). Classification of diabetes mellitus.

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