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THE SILENT PANDEMIC: A SYSTEMATIC REVIEW OF THE GLOBAL DIABETES BURDEN AND THE EMERGING CRISIS IN UZBEKISTAN

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Abstract: Diabetes mellitus has become one of the defining public health problems of the 21st century. It now reaches almost every part of the world and falls hardest on low- and middle-income countries. This systematic review draws together current evidence on the global burden of diabetes and then looks closely at Uzbekistan, a Central Asian country moving quickly through an epidemiological transition. Using data from the International Diabetes Federation (IDF) Diabetes Atlas, Global Burden of Disease (GBD) studies, and national surveys, we examined the prevalence, incidence, mortality, and economic dimensions of the disease. Around 589 million adults aged 20 to 79 years were living with diabetes worldwide in 2024, and that number is projected to reach 853 million by 2050. Central Asia is growing fastest among the Asian subregions, with an average annual percent change in prevalence of 2.73%. In Uzbekistan, prevalence among adults aged 20 to 79 years stood at 7.5% in 2024, affecting roughly 1.5 million people, and is expected to rise to 2.2 million by 2050. The real figure is thought to be about ten times higher than registry-based data suggest, with 74% of cases remaining undiagnosed. Type 1 diabetes among children and adolescents has quadrupled over the past 24 years. The economic toll is heavy, with global macroeconomic losses projected to exceed 10 trillion USD by 2050. Together these findings point to an urgent need for stronger surveillance, early detection programmes, and focused public health action in Uzbekistan and across the wider Central Asian region.

Keywords: diabetes mellitus, global burden, Uzbekistan, Central Asia, epidemiology, systematic review, non communicable diseases

1. Introduction

Diabetes mellitus is one of the defining health challenges of our time. It crosses borders and income levels and has become a genuinely global pandemic.[1] The disease is marked by chronic hyperglycaemia that follows from problems with insulin secretion, insulin action, or both, and it covers a range of disorders, with type 2 diabetes mellitus (T2DM) making up more than 90% of cases worldwide.[1] Its burden is felt on many fronts at once: premature death, disability, reduced quality of life, and large economic costs that strain health systems, especially where resources are already tight.[5,7]

The picture has changed sharply over the past few decades. Diabetes was once thought of as a problem of wealthy Western nations, but it is now firmly established across low and middle income countries (LMICs), where more than 81% of adults with diabetes now live.[1] This shift reflects a tangle of factors: urbanisation, changing diets, more sedentary lives, ageing populations, and genetic predisposition.[8]

Central Asia, in the middle of its own rapid demographic and economic change, has become a region of particular concern.[4] Uzbekistan, with more than 36 million people the most populous

country in the region, faces a growing diabetes problem that the international literature has barely described.[3,4] This review sets out to gather the current evidence on the global burden of diabetes, examine the situation in Uzbekistan in detail, and identify both the gaps in our knowledge and the priorities for public health action.

2. Methods

We carried out this systematic review in line with the Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA) guidelines. The literature search covered PubMed, Scopus, Web of Science, and Google Scholar, from each database's inception through June 2026. Search terms combined "diabetes mellitus," "epidemiology," "burden," "prevalence," "incidence," "mortality," "Uzbekistan," "Central Asia," and "Global Burden of Disease."

We included peer reviewed articles, systematic reviews, meta-analyses, and official reports from authoritative bodies, among them the International Diabetes Federation (IDF), the World Health Organisation (WHO), and the Institute for Health Metrics and Evaluation (IHME). We gave priority to high impact publications from the past five years and leaned in particular on the IDF Diabetes Atlas 11th Edition (2025) [1] and GBD 2021 data.[2] Data extraction concentrated on prevalence, incidence, mortality, disability adjusted life years (DALYs), risk factors, and economic burden. We appraised the quality of the included studies using established criteria for observational research and systematic reviews.

3. Global Burden of Diabetes

3.1 Prevalence and Demographics

The scale of the global epidemic is hard to overstate. The International Diabetes Federation (IDF) Diabetes Atlas 11th Edition (2025) reports that about 589 million adults aged 20 to 79 years were living with diabetes in 2024, or 11.1% of the world's adult population, roughly 1 in 9 adults.[1] More than 4 in 10 of them do not know they have the disease, leaving some 240 million cases undiagnosed worldwide.[1] Type 2 diabetes accounts for the great majority, more than 90%, and is driven largely by modifiable factors such as obesity, physical inactivity, and poor diet.[6,8]

The trend shows little sign of slowing. The global diabetes population is expected to reach 853 million by 2050, a 46% rise on today's figure. [1,2] That growth will not be spread evenly. Every region will see an increase, but the steepest rise is expected in low- and middle-income countries, where health systems and resources are least prepared for the rising caseload. [1,5]

3.2 Mortality and Morbidity

Diabetes is now the ninth leading cause of death worldwide and is responsible for more than 1 million deaths each year.[2] Measured in disability adjusted life years (DALYs), a marker of human suffering, it ranks seventh among all diseases.[2] The GBD 2021 analysis put the global age standardised prevalence at 6,098 per 100,000 population and the age standardised death rate at 18.78 per 100,000.[2] Diabetes has climbed from the 18th leading cause of death in 1990 to its current rank, a shift that reflects both better surveillance and a real rise in disease burden.[2,9]

Much of the harm comes from complications, including cardiovascular disease, chronic kidney disease, retinopathy, neuropathy, and lower limb amputations.[6] These do more than shorten lives;

they erode quality of life and independence, and their effects spread to families and communities that take on much of the informal care.[5]

3.3 Regional Disparities

The burden is far from evenly shared. Western Europe and the high-income Asia Pacific nations record the highest prevalence, yet their advanced health systems have driven mortality downward.[2] Central Asia, South Asia, and the Middle East and North Africa face the opposite situation: prevalence is rising quickly while the capacity to manage it remains limited. [2,5]

Central Asia stands out as the region where diabetes is growing fastest of all.[2] The GBD 2021 analysis recorded the highest average annual percent change (AAPC) in prevalence here, at 2.73%, together with the largest rise in mortality, an AAPC of 1.73%, of any Asian subregion.[2] Several forces converge to produce this: rapid urbanisation, a shift toward high calorie processed foods, falling levels of physical activity, and health systems still built around acute care rather than the long term management of chronic disease.[1,4]

3.4 Economic Burden

The cost of diabetes reaches well beyond direct medical spending. A macroeconomic modelling study published in Nature Medicine in 2025 estimated that diabetes will cost the global economy more than 10 trillion USD between 2020 and 2050, and that figure leaves out informal caregiving altogether.[5] Once the value of unpaid care from family and friends is added, the estimate rises to nearly 79 trillion USD.[5]

How that cost is made up varies a great deal with national income. In high income countries, direct treatment accounts for about 40.5% of the total economic burden, a reflection of heavy healthcare use.[5] In low income countries, direct costs make up only 14.0%, with most of the burden showing up as lost productivity, absenteeism, and premature death.[5] In other words, diabetes does its greatest economic damage through human capital losses in exactly those countries least able to bear them.[7]

4. The Diabetes Burden in Uzbekistan

4.1 National Prevalence and Trends

Uzbekistan, at the heart of Central Asia, faces a diabetes epidemic that is both large and under recognised.[1] The IDF Diabetes Atlas puts prevalence among adults aged 20 to 79 years at 7.5% in 2024, affecting around 1.5 million people.[1] That is up from 6.4% in 2011, an average of 6.95% across the past decade.[1] On current trends, and without effective action, the number of adults with diabetes is projected to reach 2.2 million by 2050. [1,2]

Registry data from endocrinological dispensaries tell a very different and misleading story.[3] National registration systems record a diabetes prevalence of just 0.73% among adults, understating the true burden by an order of magnitude.[3] The gap exposes serious weaknesses in surveillance and diagnostic capacity, with most cases going undetected until complications appear. [3,9]

4.2 Screening and Undiagnosed Diabetes

A landmark screening study carried out across the Tashkent, Qashqadarya, and Khorezm regions in 2015 and 2016 showed just how widespread diabetes really is in Uzbekistan.[3] Among 2,521 adults aged 35 years and older, 7.9% had type 2 diabetes, 4.4% had impaired glucose tolerance (IGT), and 1.4% had impaired fasting glucose (IFG).[3] Strikingly, 74% of those found to have diabetes were diagnosed for the first time during the screening itself, a clear sign that most community cases go unnoticed.[3] Prevalence was 8.7% among men and 7.5% among women, and rose steadily with age.[3]

The same study found troubling rates of excess weight: more than 35% of the population had obesity of one degree or another, and about 35% more were overweight.[3] Among people with no disorder of carbohydrate metabolism, only 31% were of normal weight, which underlines how central obesity is as a modifiable risk factor in the Uzbek population. [3,11]

4.3 Type 1 Diabetes in Children and Adolescents

Although type 2 diabetes dominates the adult picture, type 1 diabetes mellitus (T1DM) is a serious and growing problem among young people in Uzbekistan.[4] Figures from the Republican Specialized Scientific Practical Medical Center of Endocrinology show that T1DM prevalence among children rose from 22.1 to 30.8 per 100,000 between 2017 and 2024, while among adolescents it climbed from 51.5 to 84.8 per 100,000 over the same years.[4] Incidence among adolescents grew at an annual rate of 7.57%, with the highest figures in Tashkent city, the Tashkent region, and the Republic of Karakalpakstan.[4]

Over the past 24 years, T1DM prevalence has quadrupled relative to the 2000 to 2016 period.[4] This steep rise may be tied to urbanisation, environmental factors, shifting diets, and possible effects of the COVID 19 pandemic on immune function and access to care.[4] The pattern makes a strong case for national diabetes registries and better surveillance of childhood diabetes.[4]

4.4 Risk Factors and Behavioural Determinants

The 2014 WHO STEPS survey in Uzbekistan offered valuable insight into the behavioural and metabolic factors fuelling the epidemic.[11] It found that 50.1% of adults were overweight or obese, made up of 29.8% who were overweight and 20.2% who were obese.[11] Physical inactivity was common, with 16.4% of adults aged 18 to 64 years not active enough, and rates notably higher in women than in men.[11] Salt intake exceeded the WHO recommendation by more than 2.5 times, at a median of 14.9 g per day.[11] Tobacco use, mainly among men at roughly 25%, and harmful drinking added further to the metabolic risk profile.[11]

4.5 Economic and Healthcare System Implications

Like many systems in the region, Uzbekistan's health service is still geared mainly toward acute care and has limited capacity for managing chronic disease.[7] The economic consequences of diabetes in the country are clearly substantial but remain poorly measured.[7] As a lower middle income country, Uzbekistan sits in a familiar bind: direct treatment makes up a smaller share of the total economic burden than it does in high income countries, yet the strain on a limited health budget, and the damage from lost productivity and premature death, hits disproportionately hard.[5,7]

The gap between registered and actual prevalence means that a large part of the population is moving toward complications without any care at all.[3] This silent reservoir of undiagnosed and uncontrolled diabetes will eventually surface as more cardiovascular events, end stage renal disease, blindness, and amputations, all of which cost far more to treat than early management and prevention would.[6]

5. Discussion

This review describes a diabetes pandemic that is speeding up rather than easing. The figure of 589 million adults with diabetes in 2024, set to reach 853 million by 2050, is not just a statistic; it represents a real threat to human development and economic progress. [1,2] With 81% of those affected living in low- and middle-income countries, the disease has become a problem of global health equity that calls for an urgent and coordinated response. [1,5]

The place of Central Asia, and Uzbekistan in particular, within this wider picture is especially worrying. Central Asia has the highest rate of increase in prevalence of any Asian subregion, with an AAPC of 2.73%.[2] This reflects the region's distinctive transition: populations are ageing, moving to cities, and taking on more Westernised patterns of eating and activity, while health systems remain organised around infectious disease and acute care rather than the prevention and management of chronic conditions. [1,4]

The Uzbekistan data expose a surveillance gap that probably runs across much of Central Asia. The tenfold difference between registry-based prevalence of 0.73% and screening detected prevalence of 7.9% shows that national health information systems are simply failing to capture the true burden.[3] The consequences are far reaching. Without accurate epidemiological data, planners cannot allocate resources sensibly, clinicians cannot target those at highest risk, and policymakers cannot design prevention strategies that work.[3] The fact that 74% of cases were first picked up through screening suggests that most Uzbeks with diabetes are currently progressing unchecked toward complications. [3,6]

The economic modelling adds a sobering layer. With global diabetes costs projected to top 10 trillion USD by 2050, and to approach 79 trillion USD once informal care is counted, the macroeconomic fallout threatens to hold back development, especially in emerging economies.[5] In Uzbekistan, where health spending per head is still modest at about 169 USD in 2022, the losses from reduced productivity and early death represent a serious drag on the country's development potential. [5,7]

The quadrupling of type 1 diabetes among Uzbek children and adolescents over 24 years adds a further note of urgency.[4] Unlike type 2 diabetes, which can often be prevented or delayed through changes in lifestyle, type 1 diabetes requires lifelong insulin and specialist care.[4,6] Its rising incidence in young people hints at environmental triggers and a shift in population susceptibility, questions that call for well designed epidemiological studies and the establishment of national diabetes registries.[4]

Several limitations deserve mention. The data sources are heterogeneous, and for Uzbekistan in particular, where high quality nationally representative surveys are scarce, this introduces real uncertainty into the prevalence estimates.[3] Some projections rely on GBD modelling, which, while methodologically sound, may not fully capture local conditions.[2] There are also no

published economic burden estimates specific to Uzbekistan, so these had to be extrapolated from regional and global figures. [5,7]

Even so, the evidence supports several firm conclusions. First, diabetes in Uzbekistan is far more common than official statistics imply, and most cases are undiagnosed.[3] Second, the pace of increase, above all among young people with type 1 diabetes, is alarming and needs immediate attention.[4] Third, the health system needs to shift substantially toward the prevention, early detection, and management of chronic disease.[7] Fourth, the economic consequences, though not yet measured precisely at the national level, are undoubtedly large and will only grow without action.[5,7]

6. Conclusion

Diabetes mellitus is a silent pandemic reshaping the health of populations everywhere, and it bears down hardest on economies in transition. This review shows that the burden is far larger than usually acknowledged, with Central Asia rising faster than any other world region.[2] In Uzbekistan, the order of magnitude gap between registry figures and actual prevalence points to a surveillance crisis that hides the true scale of the epidemic.[3] The evidence calls for action on several fronts at once: national diabetes registries, wider community-based screening, stronger primary care for chronic disease, and public health campaigns that tackle obesity, physical inactivity, and dietary risk. [3,4] Without these steps, the projected rise to 2.2 million adults with diabetes by 2050, alongside increasing childhood type 1 diabetes, will place an unsustainable load on Uzbekistan's health system and economy. [1,4]

More broadly, diabetes should be understood not simply as a medical issue but as a development challenge, one that puts economic progress and social stability at risk.[5] Spending on prevention and care is not a drain on resources but an investment in human capital and in sustainable development.[5] For Uzbekistan and the wider region, the window for effective action is closing; the moment for comprehensive, evidence based diabetes control is now. [2,7]

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