

INCIDENCE OF DIABETES MELLITUS IN THE ZENICA-DOBOJ CANTON (2008 – 2020): A RETROSPECTIVE ANALYSIS

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Abstract: Purpose: Diabetes mellitus is a health problem that is becoming more and more widespread. This research aimed to provide an analysis of the distribution of diabetes mellitus in the territory of the municipality of Zenica and the Zenica-Doboj Canton in Bosnia and Herzegovina.

Methodology: The register of patients suffering from diabetes mellitus was used and the data from 2008 to 2020 were analyzed. Public health campaigns and family medicine programs have played a key role in diabetes detection.

Results: This analysis covers the period from 2008 to 2020. data in the Zenica-Doboj canton in Bosnia and Herzegovina showed gender differences in new cases of diabetes mellitus. Of the number of registered patients in the Zenica Doboj canton base, 10,624 in total, and in the Zenica area there were 3,641 registered in total, from 2008 to 2020, there were 7,794 registered patients in the canton area. In the area of Zenica, male patients: 1,466 (40.27%), female patients: 2,174 (59.73%). Zenica Doboj canton male patients: 4,104 (38.63%), female patients: 6,519 (61.37%). The increase in the number of women diagnosed in 2014, Figure 1 and Figure 2 indicates potential gender-specific patterns. Statistical analysis of descriptive data suggests an increased number of newly discovered cases of diabetes in ZDK in 2014.

Conclusions: This study examined how diabetes rates changed in the ZDK between 2008 and 2020. The results show how public health programs have helped identify diabetes cases. In conclusion, the increase in the number of registered cases indicates progress in disease detection and proactive health care.

Recommendations: Preventive screening programs, especially HbA1c testing, can help in the early detection of diabetes. This research highlights the importance of a healthcare strategy to address emerging challenges and calls for priority public health interventions. Screening models could include testing for dual diabetes.

Keywords: incidence trend, diabetes mellitus, public health, health system.

1. INTRODUCTION

According to the World Health Organization, diabetes includes a growing group of patients characterized by chronic hyperglycemia (WHO, 2024). Diabetes mellitus is a significant disease that affects a large number of people in the world, and the frequency is increasing (Sathyanarayanan, 2022) (Abela, 2021) (American Diabetes Association, 2025).

The research aims to show trends, incidence rates, and descriptive aspects that characterize Zenica-Doboj Canton and Zenica. Statistical analysis of the rate of prevalence and incidence of diabetes mellitus in the territory of the municipality of Zenica in the period 2008 - 2020 gives an insight into the trends of diabetes mellitus in the region.

Type 1 diabetes is associated with acute and chronic complications. Acute complications include diabetic ketoacidosis and severe hypoglycemia. Chronic complications can be microvascular or macrovascular in nature ((U.S.), 2020) (Buettner, 2020) (Ismail, 1999). Microvascular complications included retinopathy, nephropathy, and neuropathy. The pathophysiology of microvascular complications is complex. Hyperglycemia is a common underlying risk factor. Patients with type 1 diabetes also have an increased risk of macrovascular complications (Longendyke, 2024). The global incidence of gestational diabetes mellitus (GDM) continues to rise as obesity rates increase. The importance of proper screening, diagnosis, and treatment cannot be understated. This review focuses on current screening (Sarker M. R., 2024).

Recent clinical practice guidelines for diabetes, obesity, cardiovascular disease (CVD), and chronic kidney disease (CKD) emphasize a holistic, person-centered approach to care (Barnard-Kelly, 2025).

Given that DM is a health care burden, the importance of proper screening, diagnosis, and treatment cannot be understated. This review focuses on current state, and new data recently published regarding the most optimal screening techniques and future research directions help to keep the reviews focused. (Sarker M. R., 2024).

A statistical analysis of the prevalence and incidence rates of diabetes mellitus in the Zenica municipality in the period 2008-2020 provided insight into the trends of diabetes mellitus in the region. This research aimed to show trends, incidence rates, and descriptive aspects that characterize Zenica-Doboj Canton and Zenica.

2. MATERIALS AND METHODS

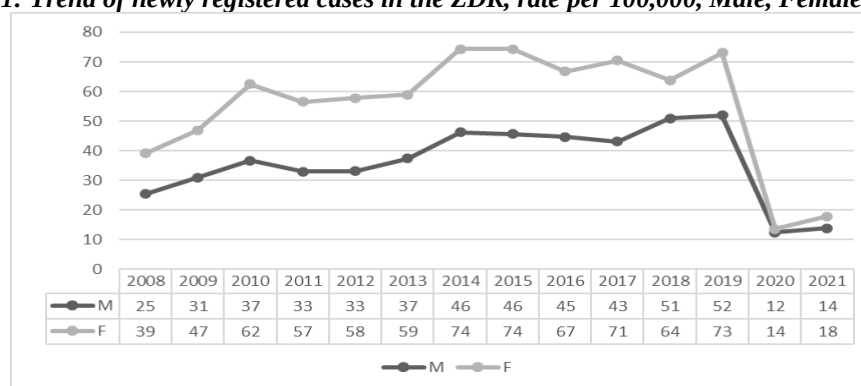
In this retrospective study, data from the register of patients with diabetes were analyzed. This study analyzed data from the diabetes registry data from 2008 to 2020. Register contains 10,624 entries of patients in the Zenica-Doboj Canton which were analyzed. Descriptive statistics were used to show incidence trends. The research strictly adhered to established bioethical standards. The confidentiality and sensitive nature of medical data are subject to strict protocols. The Institute of Health and food safety granted access to data from the Central Registry. The chosen method enabled insight without the need for contact with the patient. The confidentiality and sensitive nature of medical data are adhered to with strict protocols.

Data from the diabetes registries were confidential medical data and were treated with the utmost privacy and protection. Descriptive statistics were used to analyze incidence trends.

3. RESULTS

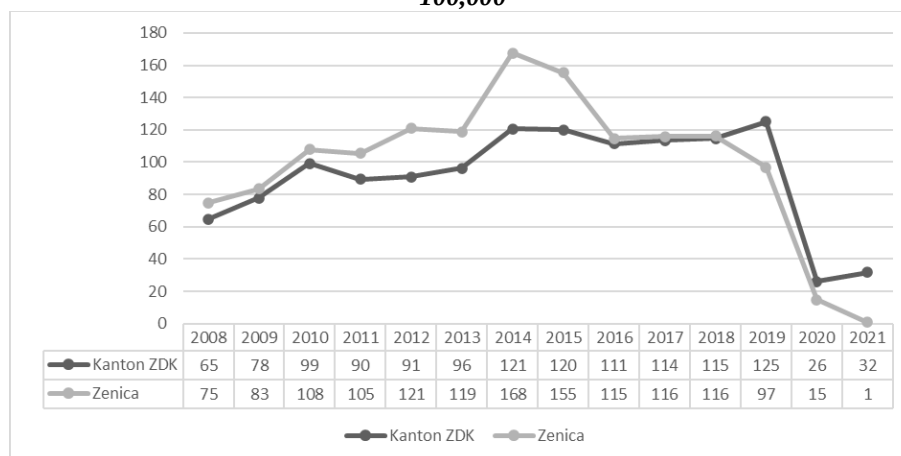
The data analysis in Figure 1 shows the trend of the increase in the number of newly registered cases of diabetes mellitus in the Zenica-Doboj Canton from 2008 to 2020. In this period, there is a noticeable increase in the number of newly registered patients, which indicates successful preventive measures and effective action within family medicine clinics.

Figure 1: Trend of newly registered cases in the ZDK, rate per 100,000, Male, Female trendline



At the beginning of 2020, there is a rapid drop in newly registered patients in the records. We can also observe this evident state using the data shown in Figure 2.

Figure 2: Trend of newly registered patients in the ZDK in relation to the municipality of Zenica, rate per 100,000



The data in Figure 2 reveal a consistent upward trend in newly registered cases in Zenica from 2008 to 2014. The graphic representation in Figure 2 shows this steady increase, highlighting progressive trends.

The data in Figure 2 reveal a consistent growth trend in the number of newly registered people in the Zenica-Doboj Canton from 2008 to 2018. A high value was recorded in 2014 in Zenica 168 patients' records rate per 100,000. The graphic representation shown in Figure 2 showed this constant increase, highlighting the progressive trend of the incidence of diabetes mellitus in the region in 2014.

Of the number of registered patients in the Zenica Doboj canton base, 10,624 in total, and in the Zenica area there were 3,641 registered in total, from 2008 to 2020, there were 7,794 registered patients in the canton area. In the area of Zenica, male patients: 1,466 (40.27%), female patients: 2,174 (59.73%). Zenica Doboj canton male patients: 4,104 (38.63%), female patients: 6,519 (61.37%). The data show that women make up the majority of patients in both locations, and the number of patients without a specified year of birth is slightly higher than in the previous analysis. The average age of male patients in Zenica: is 58.8 years old, females: 57.3 years old, Zenica, Doboj canton, male: 52.7 years old, female: 51.9 years. Patients in Zenica are, on average, older than those in the Zenica-Doboj canton.

4. DISCUSSIONS

The data indicate an increasing trend in the rate of registered people in Zenica. The increase in diabetes diagnoses in 2018 indicates that health initiatives such as early detection and screening programs have steadily increased the frequency of detection of existing diabetes patients in the past decade, both in the municipality of Zenica and in the wider Zenica-Doboj canton. Figure 2 shows that the frequency of diabetes is consistently higher in Zenica compared to ZDK. Data analysis identifies upward trends and highlights the potential impact of urban factors in Zenica.

Elevated HbA1c levels are a common risk factor associated with complications. After the DCCT, HbA1c became the gold standard for assessing glycemic control. High levels of HbA1c lead to an increased rate of complications; people with the same HbA1c level sometimes have significantly higher rates of complications (Longendyke, 2024). There is an association between prediabetes and diabetes, and other researchers have used such models to screen populations with prediabetes. Although this is a new clinical practice that needs to be investigated, the differences in glycemic metabolic profiles, possible complications, and intervention methods between the two populations cannot be ignored. (Yujin Liu, 2024).

A common complication is dual diabetes, first described in 1991. (Teupe B, 1991) Dual diabetes is (Bielka, 2024) a condition in which two major types of diabetes are present in a single patient and raises questions about whether the current classification of diabetes is still valid. It is a serious clinical problem, as it is associated with a significantly increased risk of developing complications (especially macrovascular complications), independent of glycemic control. It usually requires additional interventions, such as lifestyle changes or the addition of metformin, an SGLT-2 inhibitor, or a GLP-1RA to insulin therapy.

Studies (Bielka, 2024) (Abela, 2021) have compared one- and two-step screening processes concerning the incidence of GDM and perinatal outcomes. This review focuses on current screening guidelines used worldwide and new data recently published regarding optimal screening techniques (Sarker M. R., 2024). Testing and early detection have significantly reduced the incidence of diabetic ketoacidosis and its symptoms, as well as reducing the number of days of hospitalization at the time of diagnosis. Diabetic ketoacidosis is a serious complication of diabetes. The condition develops when the body cannot produce enough insulin (Clinic, 2025). Insulin plays a key role in helping sugar the main source of energy for muscles and other tissues enter the body's cells. Without enough insulin, the body begins to break down fat for fuel. This causes acids called ketones to build up in the bloodstream. If left untreated, the build-up can lead to diabetic ketoacidosis (Clinic, 2025). Previous studies (Bonifacio E, 2024) have shown that managing diabetic ketoacidosis could lead to a less severe course of the disease after clinical diagnosis (Bonifacio E, 2024) indicates the need for further studies addressing the long-term effects of early diagnosis and screening on children and families with an early-stage diagnosis of type 1 diabetes.

Improving the ability to detect, register, and treat diabetes and improving health service delivery is essential to address the consequences of these trends. Such measures could include searching for new sources of funding, and cooperation with other organizations or institutions dealing with health issues (Federation, 2025).

5. CONCLUSIONS

It is important to improve the ability to detect, register, and treat diabetes, and improve the provision of health services to address the consequences of these trends. Some measures may include seeking new sources of funding, and cooperation with other organizations or institutions dealing with health issues (Federation, 2025). The limitations of this analysis are primarily related to the reliance on registered data and the potential overlooking of

undiagnosed cases or existing variations. Other items rely on the efficiency of the health system in registering newly discovered cases.

The results show that public health programs have helped identify diabetes cases. The observed trends raise concerns for the overall health of the population. The increase in the number of registered cases indicates progress in disease detection and proactive health care. These findings in the literature highlight the need for further research and proactive screening like in the rest of the world. Other items rely on the efficiency of the health system in registering newly detected cases.

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