

Comparative Study of Medical Statistics of Romania-Russia-Japan about the Evolution of Diabetes

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ABSTRACT: The International Diabetes Federation (IDF) is the umbrella organization for more than 230 national diabetes associations in 170 countries and represents the interests of patients with diabetes and those at risk of diabetes. The Federation has been leading the global diabetes community since 1950. Diabetes and its complications are among the main priorities of public health (UMF Cluj-Napoca, 2009, 28-35). According to the statistical data presented in the paper in Romania in an adult population was 15,545,800 adult diabetes: 8.8% with a total of adult diabetes cases: 1,278,300, of which 30% of cases reach neuropathy. The estimated growth rate for 2045 is 15% for Romania and Russia. Japan in an adult population: 93,968,800 has 7,390,500 cases of diabetes corresponding to a sampling of 7.9% close to Russia and lower than Romania.

KEYWORDS: diabetes associations, diabetes prevalence, evolution of diabetes

Introduction

In a global context, Europe ranked 3rd in 2017 (in descending order of number of cases), with 58 million cases of diabetes, after the Western Pacific, 158 million and Southeast Asia, 82 million. In terms of estimating the evolution (%) of the number of cases by 2045, Europe is in 2nd place, this time in ascending order, by 16%, after the Western Pacific, where an increase of only 15 is estimated % of the number of cases. It should be noted that the number of cases of DM is estimated to increase by 156% in Africa

and 110% in the Middle East and North Africa by 2045 data provided on 25.02.2020. Romania and Russia are included in the European area with a total of 57 countries. Out of the total of 463 million diabetics in the world, the European area has 59 million patients, a number that will increase to about 68 million in 2045 (estimated increase of 15%).

Romania: adult population: 15,545,800; diabetes prevalence in adults: 8.8%; total cases of diabetes in adults: 1,278,300. Russia: diabetes prevalence in adults: 7.8%; total adult diabetes cases: 8,288,500; data provided on 14.05.2020. Japan is one of 39 countries in the western Pacific. Out of a total of 463 million diabetics in the world, the western Pacific area has 163 million patients, a number that will increase to about 212 million in 2045 (estimated increase of 30%). Japan: adult population: 93,968,800; diabetes prevalence in adults: 7.9%; total cases of diabetes in adults: 7,390,500.

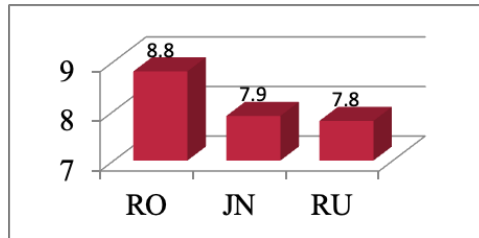


Figure 1. From the point of view of the evolution of the cases, it is observed that Romania has increasing indications for type 1 diabetes compared to Japan where the indications are on a level. Source: Statista 2021

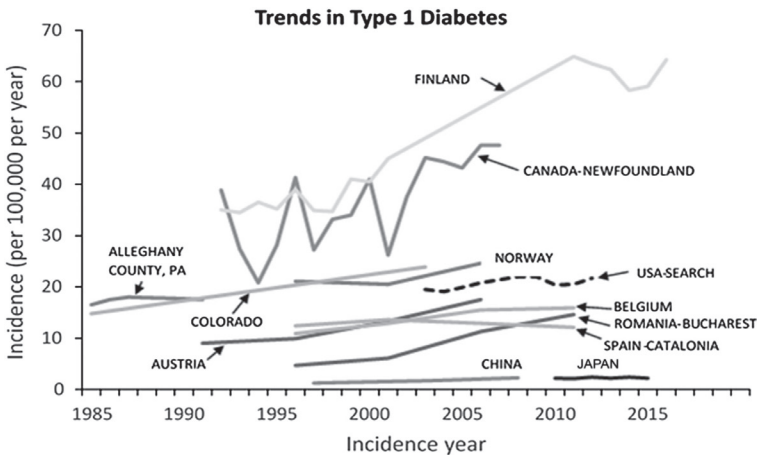


Figure 2. Trends in type 1 diabetes from 1995-2015. Source: Dabelea 2018

At the level of 2016, out of the total of 56.9 million deaths caused by diseases, a number of 1.6 million people died due to diabetes (2.8%), increasing by 1 million compared to 2000 (IDF 2016).

Diabetic peripheral neuropathy is a complication of diabetes regardless of whether it is insulin-dependent or non-insulin-dependent, with 4% of diabetic patients developing this complication five years after the diagnosis of the underlying disease, the percentage increasing to 15% twenty years after the onset of diabetes (Popa 2008, 23).

Diabetic neuropathy, one of the late complications of diabetes, can affect every segment of the nervous system. It is rarely a direct cause of death, but it is a major cause of early morbidity and disability, affecting 50-60% of diabetic patients. Studies have shown that 30-40% of diabetics have symptoms of peripheral diabetic neuropathy, the prevalence increasing with age, reaching about 44% among diabetic patients over 70 years. Peripheral diabetic neuropathy is the most common form of diabetic neuropathy. It occurs in both patients with insulin-dependent diabetes and those with non-insulin-dependent diabetes, affecting approximately equally both sexes (Jayaprakash, Bhansali and Bhansali 2011, 133).

National Diabetes of Romanian Program

Objectives:

- a) secondary prevention of diabetes [by dosing glycosylated hemoglobin (HbA1c)];
- b) ensuring the medical treatment of patients with diabetes, including specific medical devices (insulin pumps, insulin pump systems with continuous blood glucose monitoring sensors and consumable materials for them);
- c) self-monitoring of insulin-treated patients with diabetes mellitus (glycemic self-monitoring tests and continuous blood glucose monitoring systems).

1) Physical indicators:

- a) number of people with diabetes evaluated by dosing glycosylated hemoglobin: 55,920;
- b) number of patients with diabetes treated: 823,280;
- c) number of self-monitored patients: 241,600, of which:

- c.1) number of self-monitored children with type 1 diabetes: 3,440;
 - c.2) number of self-monitored insulin-treated adults with diabetes: 238,160;
 - d) number of patients with type 1 diabetes receiving insulin pumps: 280;
 - e) number of patients with type 1 diabetes beneficiaries of continuous glycemic monitoring systems: 500;
 - f) number of patients with type 1 diabetes beneficiaries of insulin pump systems with continuous blood glucose monitoring sensors: 100;
 - g) number of patients with type 1 diabetes beneficiaries of consumable materials for insulin pumps: 506;
 - h) number of patients with type 1 diabetes beneficiaries of consumables for insulin pumps with continuous blood glucose monitoring sensors: 100;
 - i) number of patients with type 1 diabetes beneficiaries of consumables for continuous glycemic monitoring systems: 500.
- 2) Efficiency indicators:**
- a) glycosylated hemoglobin tariff / dosage: 20 lei;
 - b) average cost / patient with treated diabetes / year: 1,076 lei;
 - c) average cost / child with type 1 diabetes / year: 1,860 lei (400 tests / 3 months);
 - d) average / adult cost with type 1 diabetes / year: 960 lei (200 tests / 3 months);
 - e) average / patient cost with self-monitored type 1 diabetes with continuous glycemic monitoring system or insulin pump systems with continuous blood glucose monitoring sensors, as well as for adult with type 2 diabetes and other types of insulin-treated diabetes / year: 480 lei (100 tests / 3 months);
 - f) average cost / patient beneficiary of insulin pump: 8,115 lei *);
 - g) average cost / patient beneficiary of continuous glycemic monitoring system: 12,994.80 lei;
 - h) average cost / sick beneficiary of insulin pump system with continuous glycemic monitoring sensors: 28,109.90 lei **);
 - i) average cost / sick beneficiary of consumable materials for insulin pump / year: 7,617.78 lei;

j) average cost / sick beneficiary of consumable materials for continuous glycemic self-monitoring systems / year: 10,510.50 lei;

k) average cost / sick beneficiary of consumable materials for insulin pump system with continuous glycemic monitoring sensors / year: 16,939.65 lei.

*) The average cost / patient with diabetes benefiting from an insulin pump of 8,115 lei includes the insulin pump and consumables for 12 months.

***) The average cost / patient with diabetes benefiting from an insulin pump of 28,109.90 lei includes the insulin pump with continuous blood glucose monitoring sensors and consumables for 12 months.

In **Romania**, over 60% of people with diabetes develop diabetic neuropathy, and about 7% reach not only diabetic foot, but amputations of the lower limbs, pointed out Augustus Costache, representative of the National Health Insurance House, in the opening of the VI -editions of the Congress of Diabetic Neuropathy and Diabetic Foot.

Diabetes and its complications are one of the main priorities of public health. In 2017, there were 1785,300 cases of diabetes registered in Romania. According to the PREDATORR study "Prevalence of diabetes mellitus and prediabetes in the adult Romanian population" - Prevalence of diabetes mellitus and prediabetes in the adult population in Romania: in 2017 in an adult population of 14382000 were registered 1785300 cases of diabetes in adults aged 20 to 79 years, with a prevalence of 12.4%. In 2018, 860,558 patients with diabetes received treatment under the National Diabetes Program, and in 2019 (first trimester) their number was 821,587. The rest are in various other situations (early stage that does not require medication, undetected disease or medically untreated, etc.).

The number of beneficiaries of the program has doubled in just ten years, and the budget allocated annually has increased almost five times in the same time frame, exceeding in 2018 the amount of 1 billion lei. This program is the largest of the 14 national programs carried out by CNAS in terms of the number of patients, and the second in terms of funding after cancer. Over 20% of the total funds allocated to national curative programs go to this program. Over time, the program has been continuously improved to better meet the medical needs of patients.

Russia

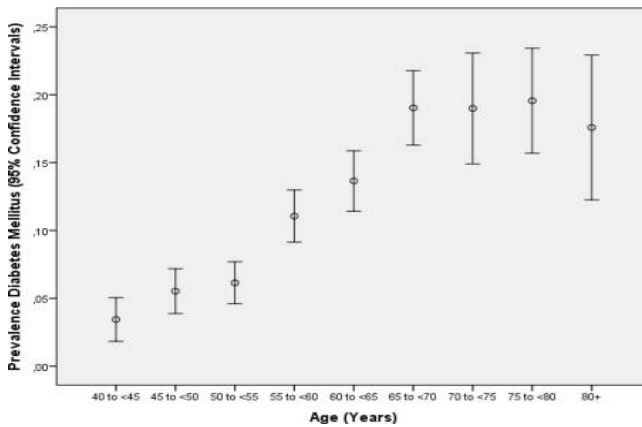


Figure 3. Distribution of cases of diabetes by age
 Source: Bikbov et al. 2019

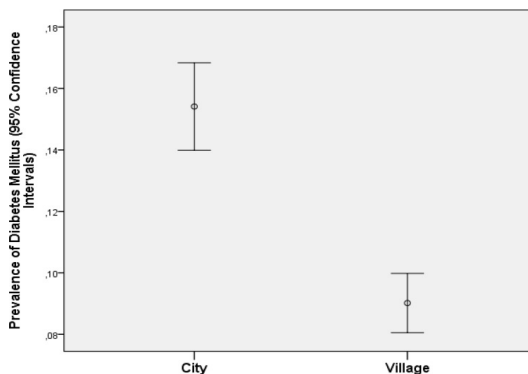


Figure 4. Diabetes prevalence (95% margin of error) compared to urban / rural environment in Russia
 Source: Bikbov et al. 2019

In **Russia**, 19.3% of the adult population has prediabetes, T2DM is diagnosed at 5.4%, and 54% of subjects with diabetes are undiagnosed. The impact on group segments shows a higher incidence with increasing age, especially after 45 years. Regarding the distribution of diabetics by sex, women are more affected by diabetes, but for the undiagnosed, the ratio changes, especially for those under 60 years of age (Bogomolov 2014).

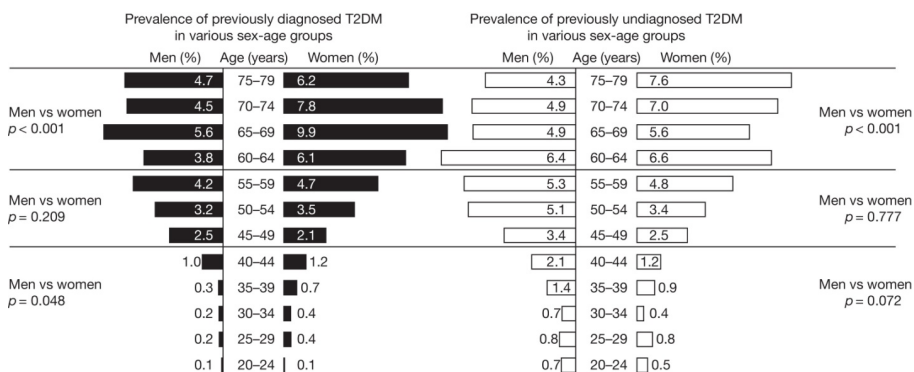


Figure 5. The prevalence of diabetes by confirmed and undiagnosed sex in Russia
Source: Dedov et al. 2016

In **Japan**, according to data published by the Japanese Ministry of Health, Labor and Social Protection, there are over 10 million prediabetics in 2016, although there is a decrease compared to 2012. For diabetics there is an increase of 500,000 compared to the data provided in 2012 and is for the first time the threshold of 10 million cases is exceeded.

Among the risk factors in the increase in diabetes are highlighted the aging population that is more vulnerable to disease and the increase in obesity due to lack of exercise and irregular diet. Another important factor is the introduction, since 2008, of mandatory medical examinations on metabolic syndrome examinations related to the prevention of lifestyle diseases. The number of cases is expected to increase due to the accelerated aging of Japan's population.

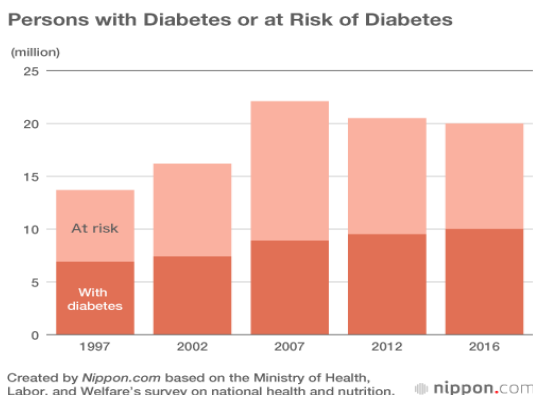


Figure 6. People with diabetes or at risk of diabetes in Japan. Source: Nippon 2018

Conclusions

According to the statistical data presented in the paper in Romania in an adult population was 15,545,800 adult diabetes: 8.8% with a total of adult diabetes cases: 1,278,300, of which 30% of cases reach neuropathy. The estimated growth rate for 2045 is 15% for Romania and Russia. In Russia there are 8,288,500 cases of adult diabetes in an adult population of 105,621,900, the prevalence of adult diabetes being 7.8%, below the level for Romania. In diabetic neuropathy, Russia has a percentage of 23.3% of cases [2011 level data]. Japan in an adult population: 93,968,800 has 7,390,500 cases of diabetes corresponding to a sampling of 7.9% close to Russia and lower than Romania. For the year 2045, an increase to 30% is forecast due to the accelerated aging.

In conclusion, Romania has the most patients with diabetes compared to the population, including those affected by diabetic neuropathy. In this case, Japan is in second place in the ranking. Russia has the lowest number of diabetics. The role of nutrition in the lives of the populations of Romania, Russia and Japan has a special importance in maintaining good health, in the correct and harmonious development of the body, in the prevention of a serious condition such as diabetic neuropathy. A healthy eating body will be stronger and will have a metabolism that will work well throughout life.

Regarding the worrying forecasts, Romania and Russia should follow the example of Japan, which has a high-performance program, detailed on diabetes comorbidities and nutritional plans included in treatment protocols at the national level. This does not exist in Romania and Russia. In rural areas in Romania and Russia, patients with diabetic neuropathy are poorly monitored, while in Japan there is clear and detailed evidence. The differences and eating habits are reflected as we have seen in the number of diabetics in each country, namely we Romanians consuming more processed foods, we are sicker than the Russians and the Japanese.

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