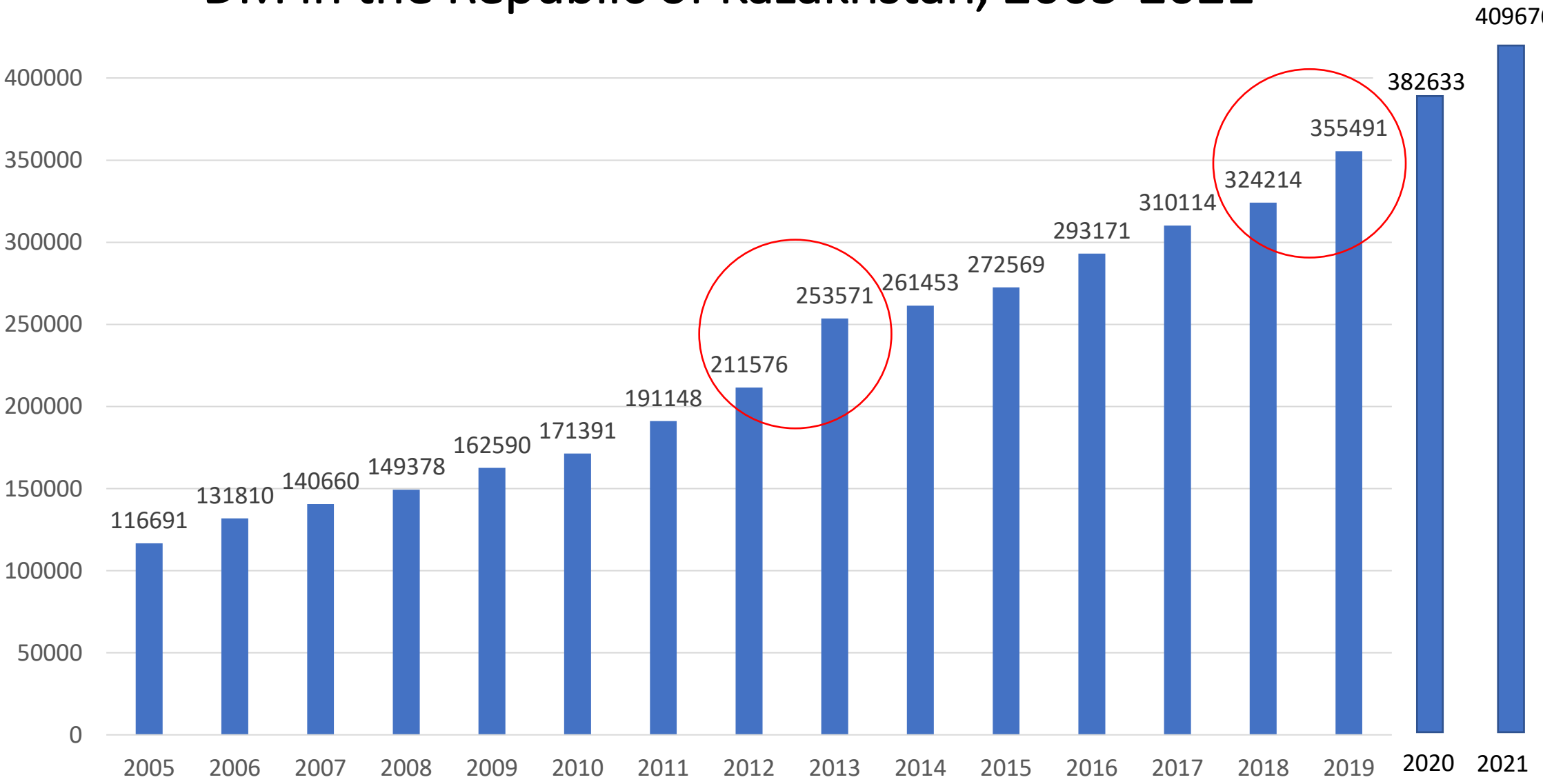
"The burden of diabetes for the Republic of Kazakhstan"

Zhanay A.Akanov, MD, PhD, Chief of Endocrinological Service,

Ministry of Health

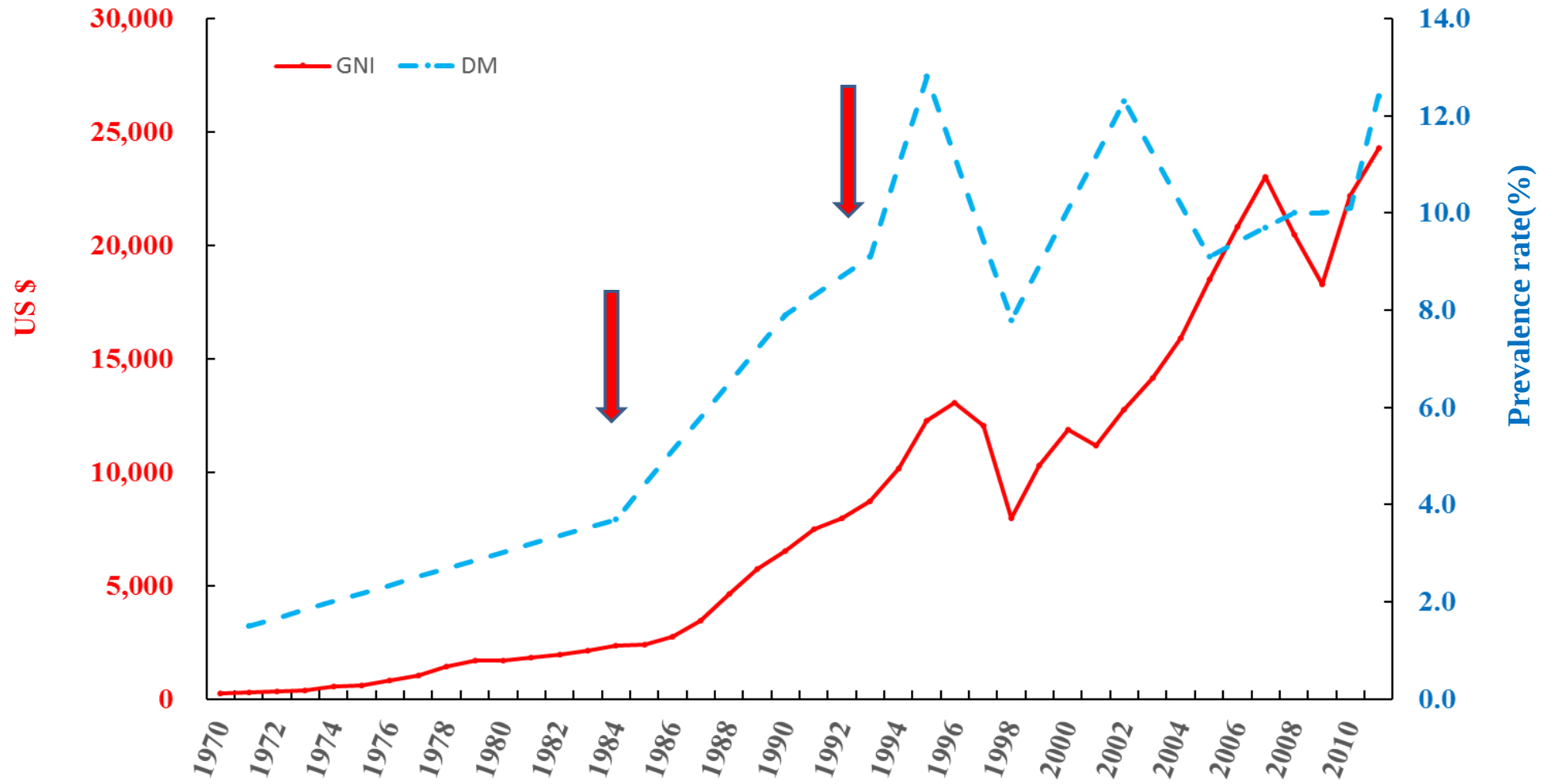
of the Republic of Kazakhstan,

DM in the Republic of Kazakhstan, 2005-2021

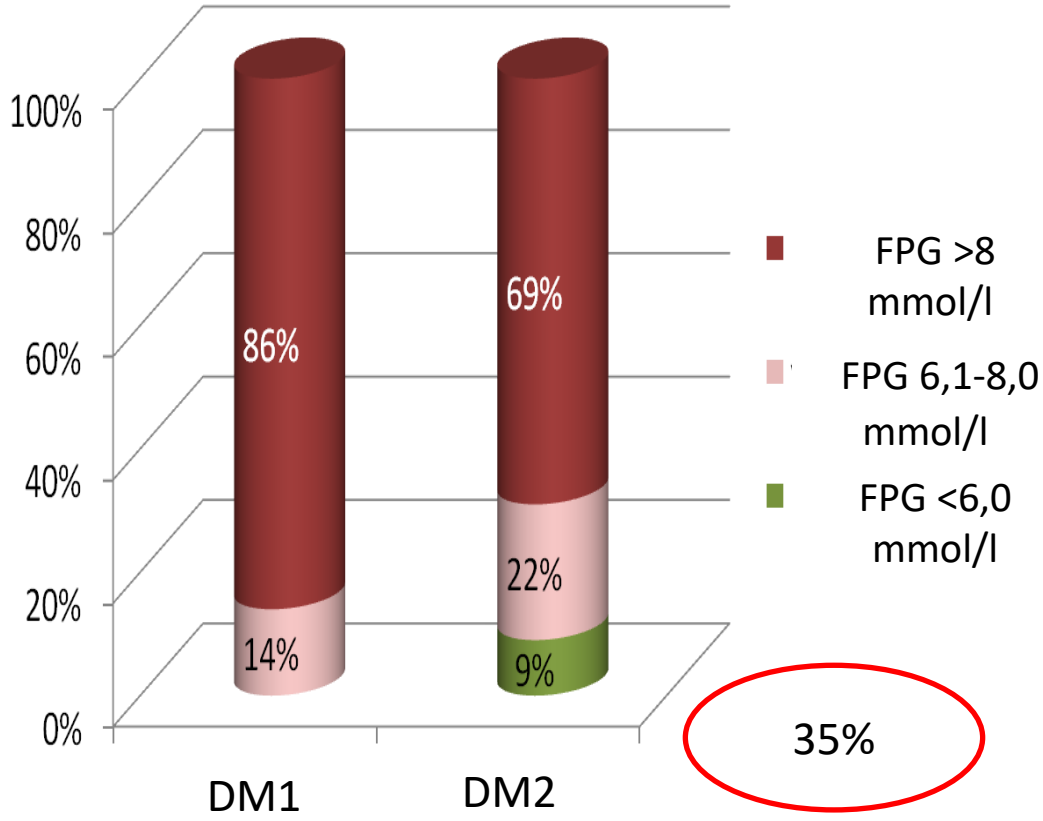


Kazakh Society for the Study of Diabetes, 2019-2021

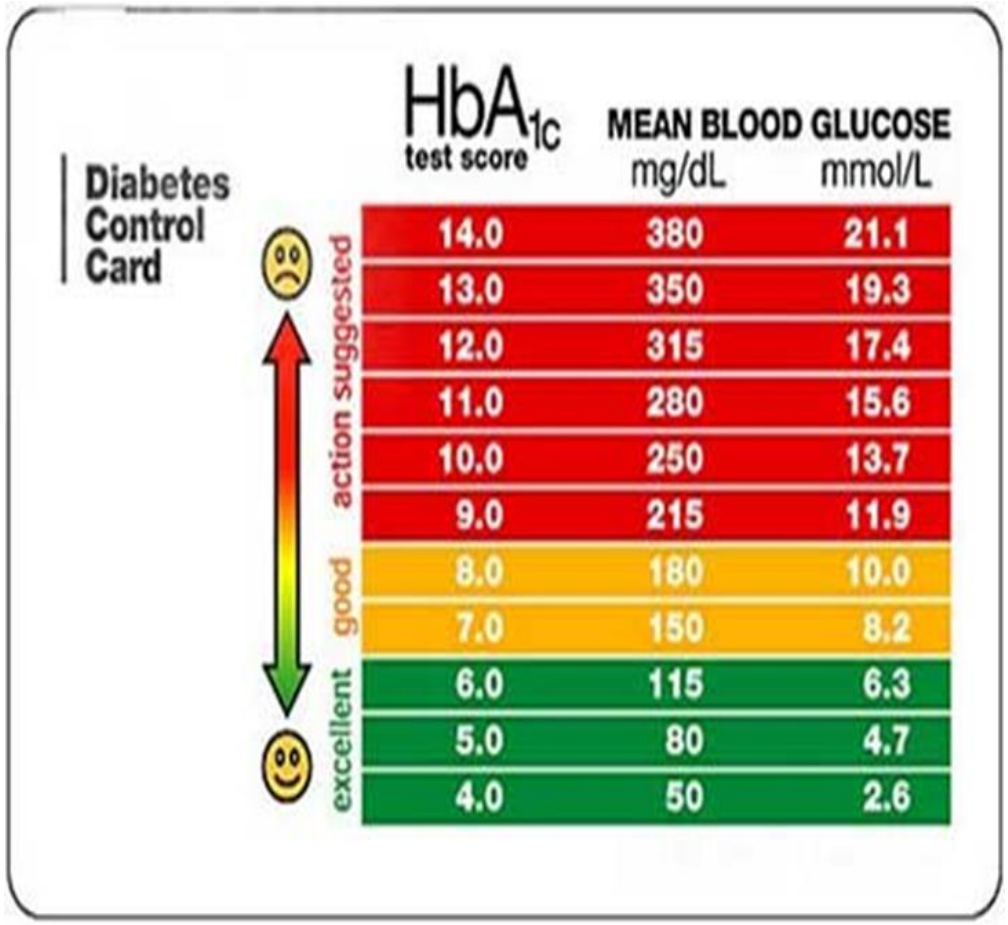
Relationship between GNI, social health insurance coverage and increasing of diabetes cases in population. (Republic of Korea, Nam Cho et all., 2013)



Glucose control: glucometer or HbA1c analyzer?



Muratalina A, 2007



“In modern conditions, the level of glycated hemoglobin is used as an integrated indicator of glycemia. According to the determination of the level of fasting glucose alone, it is almost impossible to give an objective assessment of the level of compensation for carbohydrate metabolism. Moreover, modern clinical protocols are focused specifically on the target level of glycated hemoglobin for different age groups ”- ADA 2015, EASD 2015, AASD 2016.

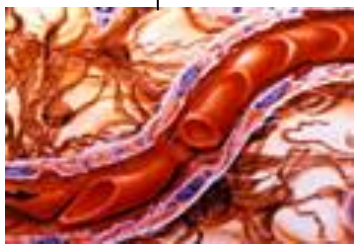
From debut to complications: 7-15 years

Normal Vision

Vision with Diabetic Retinopathy

41% has diabetes retinopathy

The average economic loss from lost years of life due to disability and mortality in working age from diabetes was 57 million USD in 2014 and 74 million in 2016 *(MOH)*



Angiopathy

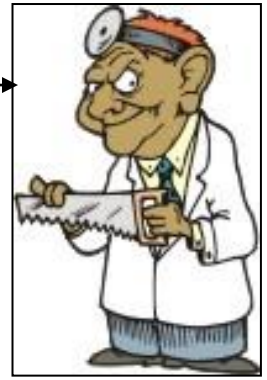
Ischemia

Ulcer

42% of all dialysis patients

Infection

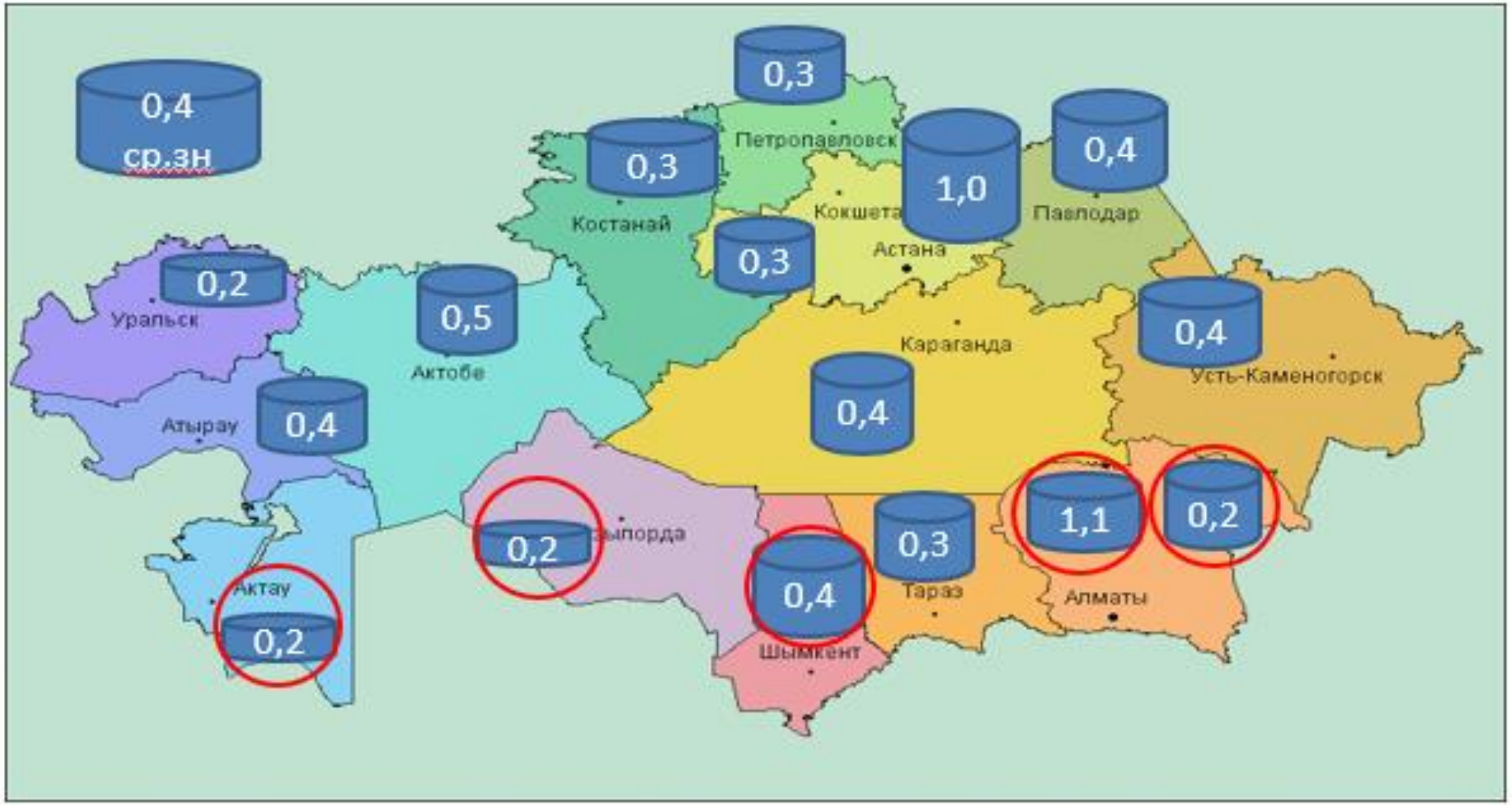
Around 600 major amputation and around 4000 amputation of parts of the foot.



Amputation

Kazakh Society for the Study of Diabetes, 2019-2021

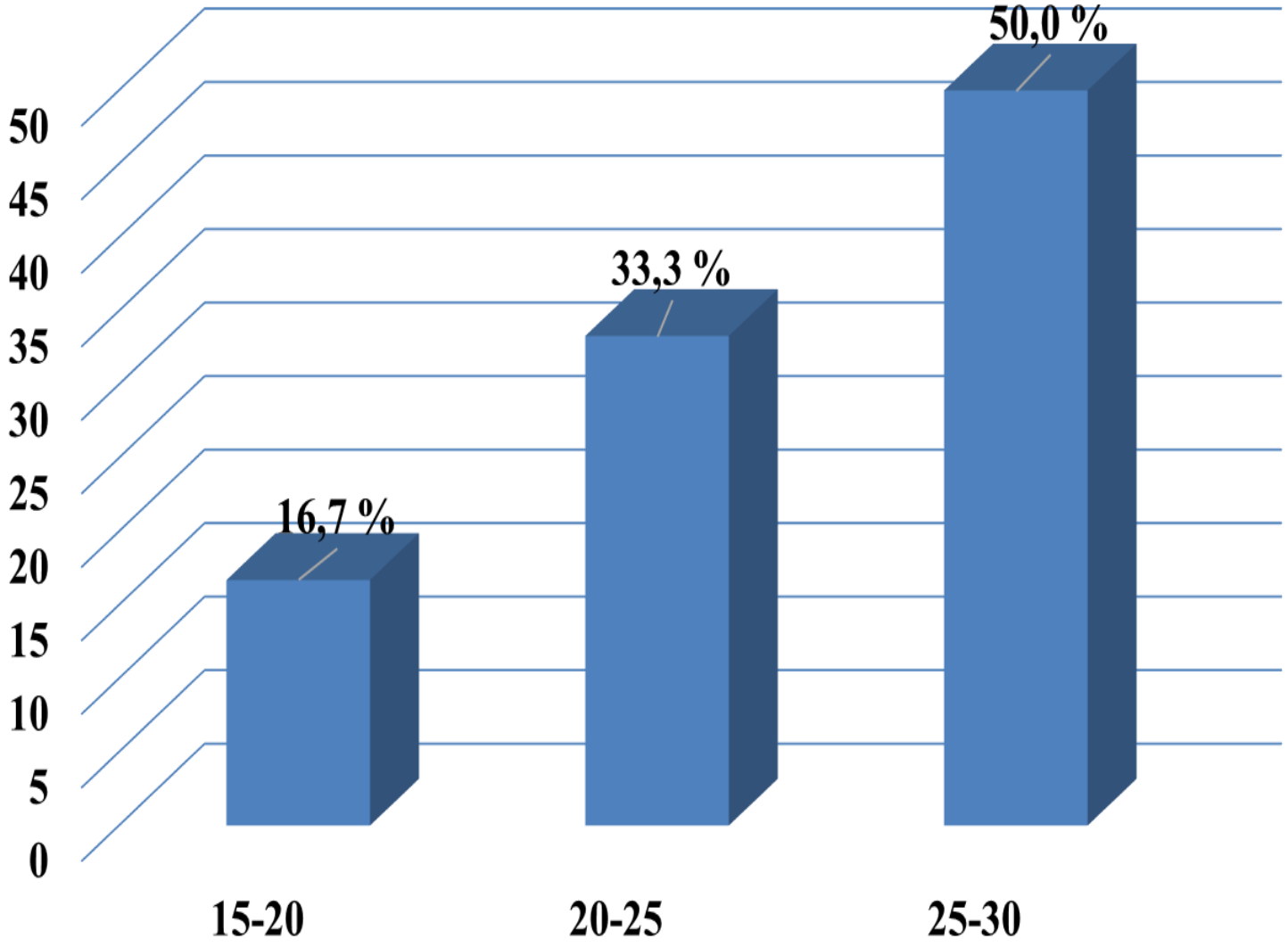
Staffing endocrinologists per 10 thousand population, 2019



Kazakh Society for the Study of Diabetes, 2019-2021

Results of a sociological survey of endocrinologists in the Republic of Kazakhstan, 2018

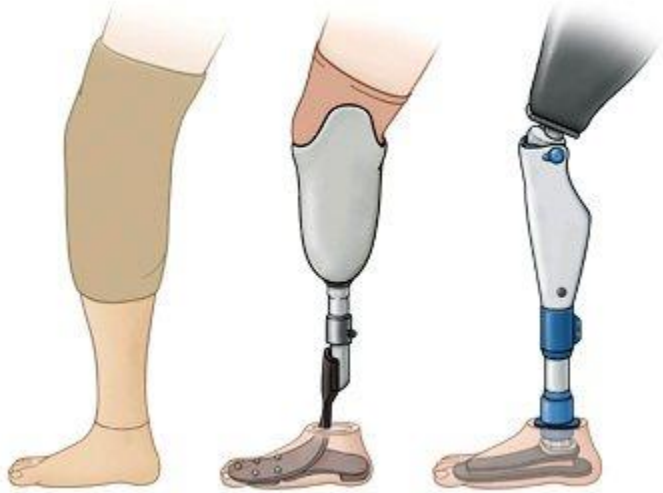
The number of patients examined by an endocrinologist per day

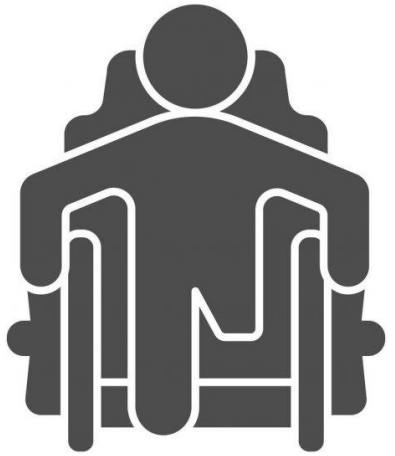


Zhangentkhan Abylayuly et all, 2018

Amputations in the Republic of Kazakhstan, diabetic foot syndrome, 2019:

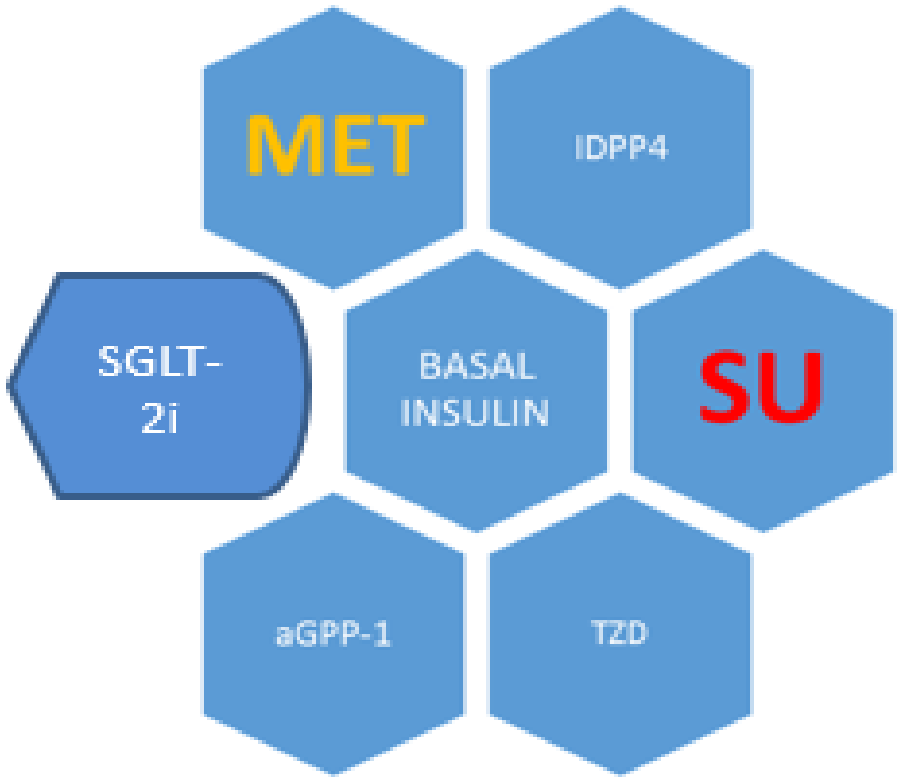
Type of operation	Quantity	Per 100 thousand of population
Major amputation	597	3,26
Ankle amputation	404	2,21
Amputation of the foot	3797	20,8
Toe amputation	8094	44,3
Total	**12892**	





Kazakh Society for the Study of Diabetes, 2019-2021

DM type 2, treatment, general practice, principles:

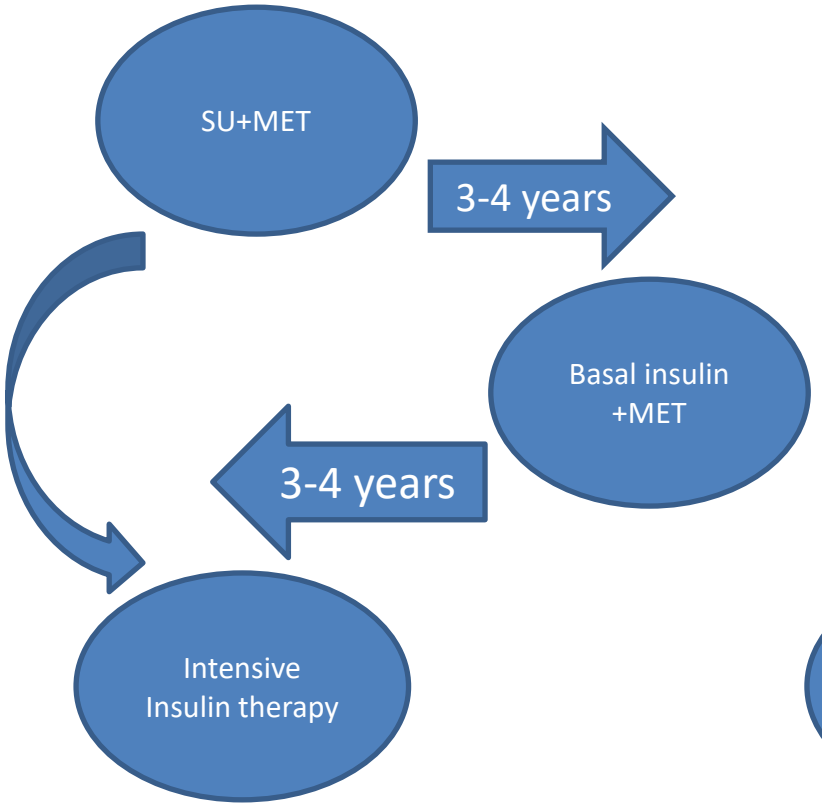


- Free treatment and pharmacological support.
- This clinical protocol was approved in July 2019.
- DPP-4 included in free drug coverage - less than 5% use.
- aGPP-1 included in free drug coverage - around 2,5% use.
- SGLT-2i included in free drug coverage - 4,8 %.
- SU and metformin –still first-line -63%
- Using of basal insulin is increasing – around 17%.
- TZD included in clinical protocol, but almost not use.

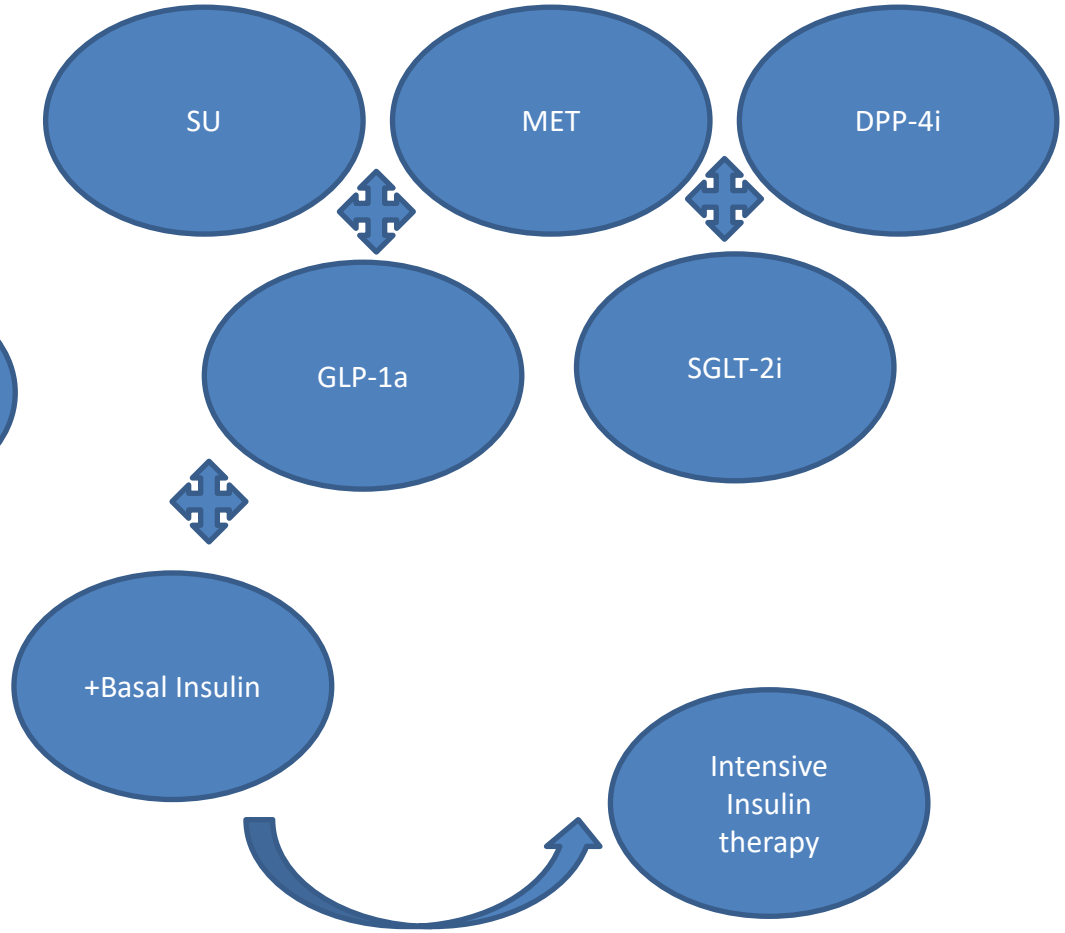
Kazakh Society for the Study of Diabetes, 2019-2021

Therapeutic approach for type 2 diabetes: the evolution of diabetes from insulin resistance to insulin deficiency.

Republic of Kazakhstan: 6-8 years



OECD: 13-15 years



Design:

- Direct non-medical costs (government spending on payments of disability benefits) were calculated based on the number of patients included in the study with a disability group and the amount of monthly disability pension, which in 2020 amounted to USD 146 for group I, USD 117 for group II USD, for group III - 79 USD. The size of the special state allowance (monthly social package - medicines, rehabilitation, travel) for disabled people of I and II groups is 11 USD, for disabled people of III group - 4.6 USD.
- The analysis of indirect costs was carried out for one year when calculating the shortfall in GDP (GDP per capita - USD 11518) due to loss of earnings due to temporary disability of citizens of working age associated with diabetes;
- When calculating the payment of wages for incapacity for work, the value of the average accrued wages in the country for 2020 was multiplied by the estimated number of days of temporary incapacity for work due to diabetes. 495 USD was the average monthly salary in Kazakhstan in April-June 2020. The average daily earnings were determined: 495/251 working days = 2 USD. The amount of the benefit was determined by multiplying the earnings for 1 day by the average number of days of disability.

Results: Costs associated with the management of comorbid conditions in type I diabetes (30611 patients).

Complications	The frequency in the population of type I diabetes	Annual expenses, USD
Hypoglycemia	5%	334 320
Ketoacidosis	50 to 100 cases on 1000 patients	932 122
Retinopathy	41,6%	4 201 080
Nephropathy	10,6%	1 317 397
Neuropathy	8,8%	1 093 700
Total		**7 878 619 USD**

Results: Costs associated with the management of comorbid conditions in type II diabetes (352,022 patients).

Complications	The frequency in the population of type II diabetes	Annual expenses, USD
IHD	17,5	19 096 484
AH	69,1	66 333 346
MI	16,3	26 614 367
HF	24,1	25 025 409
Stroke	9	12 992 277
Retinopathy	48,6	55 745 315
Neuropathy	55,8	50 897 657
Diabetic foot syndrome	13,8	19 721 935
Foot amputation	0,2	122 483 706
NAFLD	18,9	27 768 864
Nephropathy	41,5	59 308 711
Annual dialysis	113 on 100 000	2 068 163
Kidney transplantation	14,7% from total number of hemodialysis	48 374
Total		**488 104 608 USD**

Non-medical costs associated with diabetes mellitus disability.

- Analysis of direct non-medical costs (government spending on disability benefits) was calculated based on the number of patients included in the study with a disability group and the size of the monthly disability pension.
- Direct non-medical costs associated with disability due to diabetes mellitus for the year amounted to 24,778,868 USD. Disability-related indirect GDP losses were determined as follows: the number of disabled persons without work was multiplied by GDP per capita, resulting in a figure for the indirect costs of society, taking into account disability. The total non-medical costs associated with diabetes mellitus are 240,823,000 USD.

Non-medical costs associated with temporary disability due to diabetes mellitus.

- In Kazakhstan, the average annual number of days of sickness-related disability due to diabetes in the IDMPS study was determined to be 23.6 ± 40.6 days per patient. When calculating the payment of wages for incapacity for work, the value of the average accrued wages in the country for 2020 was multiplied by the estimated number of days of temporary incapacity for work due to diabetes. The average monthly salary in Kazakhstan in April-June 2020 was 555 USD. The population of patients of working age was defined as the total number of patients with diabetes older 18 years (378,465 people).
- The amount of the benefit was USD 19,831,811. In addition, the lost GDP due to temporary disability of patients with diabetes mellitus was calculated during the year: the number of days of disability in the entire population of adult patients (378,465) x the average number of days of disability (23.6) and multiplied by GDP per capita = 317,269,706 USD. The sum of indirect costs and GDP losses associated with the disability of patients with diabetes can be estimated at **300,870,980.9 USD.**

Conclusion:

- Thus, we estimate the total burden of diabetes mellitus in Kazakhstan at 1,142,417,067 USD. Direct medical costs are USD 535,492,921, and non-medical costs exceed medical costs and amount to USD 606,924,146, the ratio is 1: 1.13
- Diabetes Atlas predicts the global burden of diabetes mellitus for Kazakhstan between USD 673,329,360 and USD 969,477,500, which fully correlates with the results of our study.
- Thus, the burden of diabetes mellitus in Kazakhstan, calculated as the sum of direct medical and indirect costs, is at least 436.4 billion tenge annually, or about 1 billion USD.
- It is clear that for a more complete determination of the final values, a multidisciplinary team of researchers is needed not only in the healthcare system, but also at the government level, however, general trends, as well as the assessment of international experts from WHO, IDF confirm the correctness of the calculation and analysis algorithm.
- After this first step, Kazakhstan is preparing for develop National Diabetes Program (2022-2024).

Thank You for attention !