

# City of Copenhagen Center for Diabetes impact report 2022

## Executive summary

The City of Copenhagen's Center for Diabetes has carried out an impact evaluation involving citizens referred for local-authority rehabilitation in the period 2018–2019. The purpose of the impact evaluation was to describe the citizens undergoing rehabilitation at the centre and the benefits they derive from the programme. The impact evaluation was performed as a pre- and post-evaluation with no control group. Where possible, the results have been compared with other studies, in particular the Capital Region of Denmark's Health Profile 2017.

The data collection took place from 2018 to 2021 and was delayed in part by COVID-19, which resulted in longer programmes and probably increased drop-out. A total of 308 citizens took part in the impact evaluation.

Some of the results are subject to a high level of uncertainty due to the small number of citizens included in the analysis. It should be noted, however, that the general trend shows a positive development from the start of the rehabilitation programme to the end.

The key characteristics of the study population are described below, followed by a review of the main results of the study.

## Demographics and social factors

### The right citizens are being referred to the Center for Diabetes

Compared with the City of Copenhagen's overall diabetes population:

- There is no difference in the distribution of sexes and level of education.
- The percentage of citizens in the 45–64 age group referred to the Center for Diabetes is higher.
- The share of citizens with a non-western background referred to the Center for Diabetes is significantly higher.

### There is selection bias in respect of the citizens taking part in the impact evaluation

Compared with all citizens referred for rehabilitation at the Center for Diabetes:

- The percentage of men taking part in the impact evaluation is higher.
- The percentage of citizens with long-cycle tertiary education taking part in the impact evaluation is higher.
- The percentage of citizens with a non-western background taking part in the impact evaluation is lower.

## Course of disease and diabetes complications

The following is evident for citizens attending the Center for Diabetes:

- The majority of citizens were diagnosed with type 2 diabetes within the last five years.
- The majority of citizens are undergoing oral therapy.
- High blood pressure is the most frequent diabetes complication.
- Citizens diagnosed more than a year ago attend a diabetes check-up with their GP more often.

Among those citizens who have had diabetes for a longer period of time, more are undergoing injection or combination therapy. This is in line with clinical guidelines stating that, alongside lifestyle interventions, oral therapy should be the primary choice when initiating treatment for type 2 diabetes. There is also a

group of citizens not undergoing medical therapy, which reflects the early stage of the condition, when lifestyle interventions are the primary choice for only slightly elevated HbA<sub>1c</sub>.

## Main results

Below is a summary of the key findings for the indicators included in the impact evaluation, as well as a description of how the results will be incorporated into the centre's work to develop and improve the quality of interventions so that citizens derive the greatest possible benefit from their rehabilitation programme. In respect of mental health, physical activity and long-term blood sugar, it is particularly evident that citizens are achieving good outcomes, which in many cases are maintained beyond the programme. In other areas, such as smoking, diet and alcohol, the impact evaluation demonstrates a need to improve recruitment and the healthcare quality of the interventions.

## Mental health

The main results for mental health are as follows:

- The proportion of citizens self-rating their health as 'good' or 'very good' increases from two out of five at the start of the rehabilitation programme to two out of three at the end. This increase is maintained six months later.
- At the start of the programme, 42% of citizens at the Centre for Diabetes show signs of diabetes distress. By the end of the programme, this percentage has halved, and the trend is maintained six months later.
- Compared with citizens who have 'good' or 'very good' self-rated health, citizens who have 'fair' or 'poor' self-rated health are more frequently daily smokers and physically inactive, and often have problems sleeping.
- At the start of the programme, 43% of citizens feel confident in their ability to cope with their diabetes. Six months after the end of the programme, this has increased by 30 percentage points.
- At the start of the programme, 42% of citizens feel that they are managing their diabetes. Six months after the end of the programme, this has increased by 36 percentage points.
- One-third of citizens experience being alone sometimes or often although they would prefer to be with others.

The positive results for many indicators relating to mental health should be viewed in the context of increased academic focus on the link between chronic disease and mental health. In the coming period, mental health remains a strategic priority, and interventions will take their starting point from the above results.

## Smoking

The main results for smoking are as follows:

- At the start of the rehabilitation programme, around one in citizens at the Centre for Diabetes are daily smokers.
- At the end of the rehabilitation programme, there are slightly fewer smokers, and this remains unchanged six months after the end of the programme.
- At the start of the rehabilitation programme, three out of four citizens are planning to stop smoking. At the end, this remains unchanged, while more are planning to stop smoking six months after the end of the programme.
- One in three citizens have quit smoking after a previous stop smoking intervention, while one in four have reduced their consumption.

Compared with the Capital Region of Denmark's analyses of citizens with type 2 diabetes in the City of Copenhagen, the percentage of citizens who smoke attending the Center for Diabetes is higher. This indicates that the right citizens are being referred to the programme. The majority are motivated to stop smoking, but few actually stop smoking in connection with the rehabilitation programme. Going forward, smoking will be a specific focus area at the Center for Diabetes, and a quality-oriented effort will increase the attention on smoking in the engagement with citizens. This includes the use of the Very Brief Advice (VBA) method, recruitment to stop smoking programmes and sustained focus on smoking status.

## Alcohol

The main results for alcohol are as follows:

- There are no evident changes in citizens' alcohol consumption from the start of the rehabilitation programme to six months after the end.
- At the start of the rehabilitation programme, around 40% of citizens show signs of high alcohol consumption.
- At the start of the programme, one in 10 citizens drink alcohol at least four times a week. By the end of the programme, this has fallen to one in 20 citizens.
- The majority of citizens rarely or never drink five or more units of alcohol on one occasion.
- One in five citizens have felt within the last 12 months that they should reduce their alcohol consumption.

The lack of change in alcohol consumption from the start of the rehabilitation programme to six months after the end suggests that there is a need for action in this area. This includes stronger recruitment to interventions that reduce alcohol consumption and increased collaborations targeting the group of citizens showing signs of high alcohol consumption. It has not been possible to make comparisons with the Health Profile 2017 due to non-comparability of the questionnaire items used.

## Diet

The main results for diet are as follows:

- The percentage of citizens who feel that they have healthy eating habits is twice as high at the end of the programme as at the start. Six months after the end of the programme, the level is still higher compared with the start, but lower compared with the end.
- From the start to the end of the programme, there is a general trend for citizens to eat more vegetables and a more appropriate quantity of fruit, in other words neither too much nor too little.
- At the start of the programme, a minority of citizens are eating the recommended quantities of fish and almonds/nuts. At the end of the programme and six months later, more are eating the recommended quantities.
- There is an evident trend for citizens to generally eat less cake, chocolate, sweets and ice cream at the end of the programme compared with the start.
- Generally, there is an evident trend for citizens to drink fewer sugary drinks at the end of the programme and six months later. Among those citizens not meeting the Danish Veterinary and Food Administration's dietary recommendations, there are significantly more who are daily smokers and have a short or long sleep length compared with the group meeting the recommendations.

A general improvement is seen in the selected indicators relating to diet. Going forward, the development of intervention quality will focus on integrating the latest knowledge and organising interventions more on

the basis of the individual's needs, motivation and preferences. The tools for this include habit coaching, personalised dietary plans and programmes targeting weight loss.

### Physical activity

The main results for physical activity are as follows:

- From the baseline measurement to the final measurement, the percentage of citizens spending more than 150 minutes per week doing everyday activities rises from 30% to 40%.
- Three out of four citizens do not meet WHO's recommendation to perform  $\geq 150$  minutes of moderate-intensity physical activity per week.
- From the baseline measurement to the follow-up measurement, the proportion of citizens who do not manage to achieve an increased heart rate at any time during the course of a week (0 minutes) decreases significantly, from 25% down to 5% .
- At the start of the programme, slightly more than half of citizens get out of breath for less than 30 minutes per week and thus fail to meet the Danish Health Authority's recommendation to engage in physical activity of vigorous intensity at least twice a week for at least 20 minutes.
- At the start of the programme, one-third of citizens self-rate their physical condition as poor. By the end of the programme, this has fallen to 6%.

At the start of the rehabilitation programme, three out of four citizens would like to be more physically active. At this point, many engage in very little physical activity. However, by the end of the programme this has improved, and six months later this improvement has to some extent been maintained. Nevertheless, there is still a large group of citizens not meeting WHO's recommendations for physical activity. In order to ensure that more citizens gain the desired benefit, the focus going forward will be on tools such as heart rate monitoring, use of routine testing and citizens' adherence during and after the programme. Although the majority of citizens would like to be more physically active, the activity data show that only one in three citizens are signed up for training. This discrepancy will be investigated.

### Sleep

The main results for sleep are as follows:

- One in five citizens 'never' or 'almost never' get enough sleep to feel rested.
- Of those citizens who 'never' or 'almost never' get enough sleep to feel rested, 85% have 'poor' self-rated health.
- One in five citizens sleep either too much ( $> 9$  hours per 24-hour period) or too little ( $< 6$  hours per 24-hour period).
- The citizens' sleep pattern does not change from the start of the rehabilitation programme to the end.

Although a large group of citizens rarely or never experience getting enough sleep to feel rested, many citizens consider they feel more rested at the end of the programme, and the trend is still present six months later. The positive development can be seen in the context of a focus on sleep as part of a healthy everyday life in diabetes education, talking therapy and so on. Compared with the Health Profile 2017, more citizens at the Center for Diabetes have short or long sleep length.

### Physiological measurements

The main results for physiological measurements are as follows:

- HbA<sub>1c</sub> falls by 6.5 mmol/mol from the baseline measurement to the final measurement. This is maintained six months after the end of the programme.

- Citizens who have only had type 2 diabetes for a year have a greater decrease in HbA<sub>1c</sub> compared with those who have had diabetes for longer.
- A large percentage of citizens have obesity at the start of the programme, with 66% having a BMI ≥ 30. There is a small reduction in the average BMI over the course of the programme.
- There is social inequality in the distribution of BMI ≥ 30.
- At the end of the programme, systolic blood pressure has fallen by 10.7 mm Hg, and six months later it has fallen further still.
- At the start of the programme, 3 of 4 citizens have systolic blood pressure > 130 mm Hg. By the end of the programme, this has fallen by approximately 80 percentage points.
- Just under one in two citizens have total cholesterol > 4.5 mmol/l and one in five have LDL cholesterol > 2.6 mmol/l. At the end of the programme, no changes are evident in either total or LDL cholesterol.

In order to give a holistic view, the impact evaluation included physiological measurements that supplement the citizen-reported data. Long-term blood sugar (HbA<sub>1c</sub>) is a key indicator of well-controlled type 2 diabetes. A statistically significant improvement is seen in HbA<sub>1c</sub> from the start of the rehabilitation programme to six months after the end. A lower HbA<sub>1c</sub> level is considered to add value for the individual, the centre and society in general. At the same time, there is a decrease in systolic blood pressure in particular. Taken together, these improvements suggest increased coping skills on the part of citizens in terms of taking medication and being more physically active. A small reduction is seen in BMI, although this is insufficient for the citizens to meet the latest recommendations. Going forward, the focus will be on professional interventions targeting weight loss.

### Motivation and goals

The main results for motivation and goals are as follows:

- Three out of four citizens rate their motivation to take part in a rehabilitation programme at the Centre for Diabetes as ≥ 7 (1 = not motivated, 10 = highly motivated).
- The majority of citizens feel that they have achieved their goals during the rehabilitation programme.
- Nine out of 10 citizens rate their motivation to make use of their new knowledge and habits as ≥ 7 (1 = not motivated, 10 = highly motivated).
- The majority of citizens feel that they have acquired new ideas for their day-to-day life with type 2 diabetes.

Citizens referred to the Center for Diabetes are mostly motivated to take part in the programme, and the vast majority feel that they have achieved their goals. Going forward, the Center for Diabetes will focus on using professional tools that support the citizens' work on goals. Collaboration with external partners, including general practice and civil society organisations, can help ensure that citizens maintain their goals, motivation and healthy lifestyle.