



Public Health

Health as a challenge for society

A clear lack of physical activity is the root cause of many diseases and physical ailments which are characteristic of today's industrialised societies. A large share of jobholders work in offices and spend most of their everyday working life sitting down and are thus exposed to a high level of stress. Moreover, many people spend several hours daily in their cars or on public transport. Many children and young adults also show a considerable lack of exercise, which is often attributable to their spare time being marked by intensive media use. This trend poses major challenges to the healthcare system. After all, lack of physical activity causes major health problems, in particular long-term effects, culminating in far-reaching financial problems that give rise to increased healthcare costs.

Various actors from the public healthcare sector are increasingly relying on preventive measures to counter the lack of exercise and its effects. In this context, the promotion of cycling offers a huge potential with relatively low costs. Especially for people with little time for exercise, cycling to work is a good opportunity to integrate physical activity into day-to-day life. Even if the trip to work takes slightly longer, ultimately, 'time is saved' through a healthier and longer life.

Positive effects of cycling

Cycling can impact people's health in many different ways. It can reduce health problems, improve physical

and psychological well-being and enhance the quality of life.

Reduction of overweight

Regular cycling can counter a series of diseases and impairments of well-being. Another important aspect, of course, is that it helps reduce excess weight and prevent adiposity. About one quarter of Germany's population is overweight; while 6 to 7 % of EU citizens suffer from obesity. These people are at particularly high risk of suffering from lifestyle diseases, such as heart failure, high blood pressure or high cholesterol levels, and in some cases also psychological problems. Apart from a change in diet, regular exercise can particularly contribute to losing excess weight. Cycling is particularly an ideal

Cover image: "Love Your Bike" campaign by Friends of the Earth in Manchester. © Graeme Sherriff

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form of exercise for overweight people as 70 % of the body's weight is borne by the saddle: In this way fat metabolism is stimulated without overstraining the passive musculoskeletal system, to which, for example, the hip joints belong. Moreover, cycling contributes to weight reduction by burning energy. About 600-800 calories can be burnt during 60 minutes of cycling.

Reduction of psychological stress

Stress or other psychological problems do not only have a negative effect on people's well-being, but also cause many physical ailments. Physical activity counteracts this process by controlling the hormonal balance, for example. Moreover, the smooth and uniform movement associated with cycling has a direct relaxing effect. After 30-40 minutes of physical exercise, the body releases feel-good hormones. Also, there is proof that regular exercise reduces the risk of developing alcohol addiction.

Reduction of heart and cardiovascular diseases

In Germany, about 150,000 people die every year of heart failure. It has been scientifically proven that physical activity and movement reduce the risk of heart attack or other heart diseases. Cycling is particularly ideal as it offers many advantages associated with placing moderate stress on the musculoskeletal system. Regular exercise reduces the risk of suffering a heart attack by about 50 %.

Reduction of spinal diseases and back pain

Many people are exposed to overexertion of the back. Hard physical labour, as well as office work performed sitting down, harbours such risks. Excessive competitive sports may also cause harm. However, physical activity engaged in moderately can release tension and strengthen the back. With an optimum posture, where the upper

body is bent slightly forward, cycling stabilises the back muscles and strengthens the trunk. Moreover, the cyclic movement of the legs and the asymmetrical stimulation caused by the pedalling movement are particularly beneficial.

Reduction of metabolic process, hyper-cholesterol, and high blood pressure

In addition, cycling helps improve the metabolic process of the body and compensate for an unhealthy consumption of excessive fat. Moreover, the cholesterol balance is changed, increasing 'good' HDL cholesterol and reducing 'bad' LDL cholesterol. Physical activities, such as cycling, can also prevent, or at least reduce, high blood pressure.

Enhanced stamina

A good stamina not only helps prevent the aforementioned lifestyle diseases, but also forms the basis for every form of human activity and prevents accelerated fatigue and tiredness. To improve stamina, experts generally recommend engaging in moderate exercise for at least 30 minutes. Especially for beginners, cycling offers the additional benefit that the level of physical exertion is not too high.



*A lifetime of cycling increases keeps people active and healthy when they are elderly.
© top: Jörg Thiemann-Linden, left: bicy.it*

CYCLING (EXERCISE PERIOD)		MAIN EFFECTS
✓ 10 MIN		MUSCULAR SYSTEM, CIRCULATION, JOINTS
✓ 20 MIN		STRENGTHENING IMMUNE SYSTEM
✓ 30 MIN		IMPROVED CARDIAC FUNCTION
✓ 40 MIN		IMPROVED STAMINA / ENDURANCE CAPACITY
✓ 50 MIN		LOWER METABOLISM (FAT METABOLISM)
✓ 60 MIN		LOWER BODY WEIGHT
✓ > 60 MIN		ANTI-STRESS, GENERAL WELL-BEING

























Main Health Benefits of a Cycling Workout.
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Sources

HEAT (Health Economic Assessment Tool) by the Transport – Health – Environment Pan-European Programme of the World Health Organization (<http://www.heatwalkingcycling.org/>)

Centre for Health, German Sport University (2004): Cycling and Health Compendium (http://www.selleroyal.com/news/CyclingAndHealth/big/Cycling&Health_UK.pdf)

ADFC Cycling to Work Campaign (<http://www.mit-dem-rad-zur-arbeit.de>) (German)

AGE IN YEARS	SEX	CYCLE USE / GOAL ATTAINMENT MAIN BENEFITS OF HEALTHY CYCLING	MOBILITY REGULAR EVERYDAY USE 20 MIN / DAY	LEISURE SPORT 60 MIN / TU *
20-30	 	BODY TONING FUN, GENERAL WELL-BEING	 	 
30-45	 	LOWER METABOLISM RELAXATION, ANTI-STRESS	 	 
45-60	 	STRENGTHENING IMMUNE SYSTEM CARDIOVASCULAR EXERCISE	 	 
60 +	 	SKELETAL SYSTEM (POSTURE) ANTI-AGING	 	 

* TRAINING UNITS

 = MODERATE  = GOOD  = EXCELLENT

Main benefits of healthy cycling in various target groups.

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Enhanced joint protection

One negative side effect of many physical activities is that they put a lot of strain on the joints. Cycling is unlike jogging in that the joint movements are circular, and the joints are directly exposed to only minor forces because, as mentioned before, the body weight is borne by the bike saddle.

Enhanced quality of life

Quality of life means something different for every human being. Nevertheless, there are surely criteria that most people consider important, such as good health and a well functioning body. Hence, cycling can help enhance the quality of life; not least because of the pleasure many people derive from it.

Positive health effects

In addition to the other health aspects already mentioned, cycling offers a number of preventive health benefits. Regular cycling, for example, helps strengthen the respiratory muscles, optimise oxygen exchange and improve blood circulation. It also strengthens the immune system, enabling the body to fight off pathogens and other agents more successfully. Concluding, it is important to mention that the desire to appear as physically fit as possible motivates many people to continue or start exercise routines.

Health problems caused by accidents

When considering the health effects of cycling in a broader context, accidents involving cyclists too be-

come a focus of attention. In this context, increased accident risk is often cited as a negative effect resulting from a rise in cycling rates. In fact, the results of recent studies, such as a study conducted by the Dutch National Institute for Public Health (RIVM), conclude that the shift away from motorised traffic causes a higher number of hospital-treated injuries resulting from accidents. The so-called one-sided accidents, in which only one cyclist is involved and often no major injuries are sustained, account for a large proportion of these accidents. When putting the accident risks in a wider context, it is arguable that the positive effects of cycling on fitness and health more than outweigh the risks. A British study (SQW 2007), for example, concluded that the positive effects resulting from 'normal' bicycle use outweigh the loss of life through cycling accidents by a factor of 20:1.

How can the health effects of cycling be measured?

As part of the 'Transport – Health – Environment Pan-European Programme', the World Health Organization developed a tool called HEAT (Health Economic Assessment Tool) to help quantify the health effects of cycling. HEAT is available online and can be easily used by a wide range of users. In simplified terms, the tool calculates an answer to the following question backed by statistical figures: If x people cycle or walk y distance on most days, what is the economic value of mortality rate improvements?

To calculate the outcomes, the following data is needed:

- an estimate of how many people in total cycle or walk in the respective unit (company, municipality, country)
- an estimate of the average duration of these trips
- the average length of trips made
- the number of trips made by one person (per year) on bike
- the number of steps made by one person (daily) on footpaths

This data is then put in relation with available parameters and some estimates regarding the health effects related to cycling and walking, so that in the results the maximum and average annual economic value can be considered, while also taking the discount rate into account.

HEAT is thus a tool that can be used in a wide range of different situations. It can, for example, help quantify the actual cost-benefits of a specific traffic measure. It can also quantify the positive effects regarding life expectancy, which are calculated by considering the trips made by walking or cycling, taking into consideration a specific business location, city or entire country. HEAT has been used in various regions and cities of the world, for example, in the city of Pilsen in the Czech Republic, but also at national level, such as in Austria and New Zealand.

Cycling promotion as a health strategy: the 'Cycling to work' campaign

One of Germany's largest health insurance companies, together with the German Cyclists' Federation ADFC, initiated the 'Cycling to Work' campaign. The campaign aims at promoting health through cycling as a mode of



Top: Employees using their bikes on their way to work. Left: Bicycle friendly infrastructure, like turnstiles, at work encourages a healthy, sustainable lifestyle.

© top: riese und müller GmbH, left: Planungsverband Ballungsraum Frankfurt am Main.

transport and, encouraging people to take up cycling, increasing their level of physical activity and well-being. The 'Cycling to Work' campaign is a massive initiative aimed at employees working in companies and public institutions. The employees are asked to team up in groups of 3 to 4 and cycle to work on at least 20 days over a period of 2 months. Every company chooses a voluntary coordinator who liaisons with the organisers of the campaign. The teams keep a so-called 'action diary', where they record all the trips they made. Successful teams, whose members cycled to work on at least 20 days, are eligible for prizes donated by sponsors. Since the pilot project was started in Bavaria in 2001, the 'Cycling to Work' campaign has continuously grown. In 2011, over 170,000 employees from all 16 Länder took part in the campaign.

Conclusion

Cycling offers positive health benefits to almost everybody. However, the type of cycling and level of intensity people engage in varies from person to person. The most significant health effects for each person also vary: While the emphasis for young cyclists aged between 20 and 30 is on pleasure, action and overall fitness, cycling offers older cyclists aged between 45 and 60 significant health benefits, such as strengthening the immune system and preventing cardiovascular diseases. For elderly people cycling is important because it helps stabilise their skeletal system and offers anti-ageing benefits.

Different types of bicycles can also provide health benefits depending on the age group and intended use. Therefore it is crucial to properly adjust the handlebar, the saddle and the pedals to ensure a comfortable sitting position. Fit and experienced cyclists can cycle at high speed on a road bike in a bent-over position. However, for more laid-back leisure cyclists of all age groups, the upright position provided by trekking or city bikes is more suitable. Ultimately, in order to enjoy long-term health benefits, it is crucial for cyclists to find out which type of bicycle and form of use they enjoy most.



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More information on public health can be found in
CyE A-3 Moving the Economy by Cycling
CyE A-11 Ageing Society on Bicycles
CyE S-2 Cycling to School

"Cycling Expertise" is available online:
www.nrvp.de/en/transferstelle

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Department for Mobility and Infrastructure
Editors: Jörg Thiemann-Linden, Tobias Mettenberger
cycling-expertise@difu.de