

PREHealth

Designing health into urban green and blue infrastructures – The need for action in planning, policies, and research

National Report Germany



Erasmus+



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This report is part of the Erasmus+ Project "PREHealth: Promoting education and jobs to enhance the use of urban blue and green infrastructure for health and fitness" submitted in fulfilment of the Intellectual Output 1: National Report Germany.

The objectives of the current report are to give an overview of:

- The German national literature, examining health behaviours of the population and the usage of open spaces.
- The policy and planning practices of Germany and the city of Darmstadt regarding the use of open space for promoting health and well-being.

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Executive Summary

This report gives an overview of three different health-related behaviours (active recreation, active travel and social interaction) in relation to urban green and blue spaces in Germany. Based on literature review and expert interviews performed, the results show that the German population is not sufficiently physically active. Those who are, appear to be active mostly in open public spaces and for recreational purposes, specifically within the city of Darmstadt.

In comparison to the rest of the EU, the German population tends to prefer a more active recreation; i.e. they undertake (outdoor) leisure activities which are carried out for the purpose of relaxation, health and well-being or enjoyment and which require physical exertion. In the city of Darmstadt, the active recreation patterns remain as in the rest of the country. In terms of locations, 42% of the German population engage in sports as a physical activity (PA) in open spaces like parks, streets or squares (EU average is 40%), but most of them engage in PA or sport at home (46% of the population). In the city of Darmstadt, a survey found out that with increasing age, people tend to be active in open spaces more often. Regarding active travel in Germany, while cycling is slowly increasing during the last years, the domain of the car is still noticeable. Regarding social interaction, Germans seem to be satisfied with their personal relationships and to participate in recreational groups or organizations (e.g. sports clubs, hobby associations, or leisure clubs). According to Eurostat, Germans state to feel satisfied with their social relationships, which is essential for the mental health. These studies do not consider the evaluation of these interactions in specific locations, for example, in open public spaces, or near a blue infrastructure, or in green spaces, etc.

The amount of open public spaces in Germany is similar to the average in the EU countries: 12.5m² of sport and recreation areas per inhabitant, and 4.6m² of public green areas per inhabitant. Comparing the patterns of Darmstadt to other European cities, this report assesses a positive picture of open spaces. Darmstadt is surrounded by a forest belt, which covers 49% of the municipal area, a very high number compared to other municipalities. In addition, the citizens confirm that they actively and often use the urban open public spaces, also with the purpose to be with other people, which accounts for social interaction. Recent surveys underline that maintenance and cleanliness, trees in good condition, and lawn areas to lie down and play are the most important features of parks for Darmstadt citizens.

Policies and practices are being implemented in Germany and in the city of Darmstadt to promote health-related behaviours among the citizens and qualify urban open spaces to support these activities. One example is "StadtumbauOst" in Darmstadt, which is an urban renovation project that started in October 2016 and has as main goals to improve the public spaces, connect the blue and green infrastructure, upgrade the residential environment and to modernize the area.

Conclusively, this report gives an overview of the current knowledge about the relationship of health-related behaviours and the open spaces in Germany and in the city of Darmstadt. It shows that more research on the topic and more cooperation between institutions when planning is needed.

Acknowledgments

The present report was produced in the framework of the ERASMUS+ project "PREHealth: Promoting education and jobs to enhance the use of urban blue and green infrastructure for health and fitness", and aims at presenting the findings of a literature review on the connection between health-related behaviour and the use of open spaces in European countries with a focus on the four participant countries and cities: the Cities of Athens in Greece, Darmstadt in Germany, Eindhoven in the Netherlands and Győr in Hungary. The findings presented provide a conceptual framework for recognizing the important role of urban green and blue infrastructure in promoting and increasing health-related behaviours, addressing policy and decision makers, educational authorities, local civil society organizations and key persons in the fields of urban design and planning, lifelong learning and public health, as well as the general public.

We express our gratitude to the various experts in planning and policy regarding health and open public spaces in Germany for their time and support to the study.

1. Introduction

Only 46% of adults and 27% of children and adolescents in Germany reach the WHO minimum standards of at least 150 minutes of physical activity (PA) throughout the week (WHO, 2018). While there is growing evidence that the built environment relates to physical activity on a population level, it remains unclear, how these mechanics work on a more specific level: What potential is there to encourage citizens with very different motivations and needs to use their green and blue open spaces in a healthier, i.e. more physically active way?

This report as part of the PREHealth research and action project aims to give a brief overview of the scarce literature in Germany and the city of Darmstadt in particular. It is focused on three health-related behaviours: active recreation (i.e. outdoor recreational activities, such as organized sports and playground activities that require extensive facilities or development), active travel (i.e. walking and bicycling as a mode of transport) and social interaction (i.e. the activities that a person engages in with family, friends, colleagues, acquaintances and others). The report pays special attention to the different socio-economic groups in society and urban open public spaces (green and blue infrastructures, street networks, and squares), providing information on the actual status, and the usage of these spaces.

Furthermore, this report will try to give an insight of actual policies and planning processes that are related to health-related behaviours and open public spaces. Moreover, examples from best practices will be described with the pedagogic objective to learn from actual case studies. To achieve these goals, the report adopts two different methods: a literature review and expert interviews.

2. Challenges

Sedentary behaviours are raising among the German population and not even the half of the population reach the minimum standards of PA. In addition, economic costs that result from lack of physical inactivity are a burden for public health budgets, which can be estimated to cost a country about 150–300 Euros per citizen per year (WHO, 2017a).

The lack of PA in the European Region is being represented in the rise of non-communicable diseases: “Of the six WHO regions, the European Region is the most affected by non-communicable diseases (NCDs), and their growth is startling. The impact of the major NCDs (diabetes, cardiovascular diseases, cancer, chronic respiratory diseases and mental disorders) is equally alarming: taken together, these five conditions account for an estimated 86% of the deaths and 77% of the disease burden in the Region” (WHO, 2017b).

Germany is also following the world trend: the increase of the urban population. According to the World Bank data, in 2014, in Germany more than 75% of the people live in urban areas, and the trend shows that it will keep increasing. This trend comes along with the pressure on the urban land, the increase of housing and the decrease of free spaces for green, blue and public areas. As cited in Nieuwenhuijsen (2016), in Europe, green space coverage increases more rapidly than city area, but a decline in green space availability per capita accelerates with increasing population density. This suggests that access to green space could decline rapidly as cities grow, increasing the geographical isolation of people from opportunities to experience nature. This is a fact that threatens the accessibility of urban open public spaces, which play an important role in enhancing a healthy behaviour in city dwellers.

3. Approach (methodology)

This report gives information about Germany in general but also from the city of Darmstadt. Darmstadt is a city in the state of Hessen, Germany, located in the southern part of the Rhein-Main Metropolitan Region, near Frankfurt. Darmstadt has a population of 160,686 inhabitants (2017) and the larger urban zone has 431,000 inhabitants (Wissenschaftsstadt Darmstadt, 2018).

To understand the status, the policies and practices regarding, health-related behaviours and the open public spaces, we used a combination of two methods: literature review, to gather facts, statistics and general knowledge about the topic, and expert interviews, to obtain insight information about the current situation in planning processes and policies.

To address the problem of health-related behaviour and public open spaces with a focus on different socio-economic and cultural profiles, the research adopted a holistic scope: first, the broad concept of health and its variables was introduced and second, specific assets of health (PA as a way of wellbeing or health-related behaviour), its determinants (the built environment: urban public open spaces), and the person and its social relationships as the centre of the research (different socio-economic groups) was targeted. Since the concept of health varies depending on author and epoch, it was approached from a general perspective and not with a fixed limited definition. The definitions in this review, rather than being extensive, are explanatory for this project.

The focus of this study is the health-related behaviour, which comprises active travel, active recreational use of spaces, and social interaction. Moreover, we focused on urban publicly accessible open spaces within cities. This is because the area where the physical activity is performed plays an important role and may be a key to achieve successful practices.

In this frame, the urban public open spaces in the city (green and blue infrastructures and street networks) figure as platforms to increase PA among city dwellers through their accessibility and their qualities. Therefore, these open public spaces and their characteristics are a focus in our project.

For green infrastructure we understand an interconnected network of green spaces that conserves natural ecosystem values and functions and provides associated benefits to human populations (Coutts & Hahn, 2015, p. 9970) (Benedict & McMahon, 2002). Blue infrastructure in urban areas comprises all surface water within a city, e.g. lakes, rivers, coastal water (Volker & Kistemann, 2015).

The street network is the representation of the urban system, which includes axes, intersections and nodes. At the same time, they form the basis of the transportation systems in a city.

Based on the concepts described, the research questions addressed by this report are as follows:

1. What is the relation between health-related behaviour (active travel, active recreational use, and social interaction) and urban public open spaces (green spaces, squares, street networks, blue infrastructure)?
2. How do socio-economic, demographic and cultural profiles relate to health-related usage of public open spaces?
3. What are the health-related policies and best practices in the city of Darmstadt?

This review is focused in Germany with depth information about the city of Darmstadt.

4. Main findings

Germany has adopted the WHO's Global Recommendations on Physical Activity for Health in 2010 as its national recommendations. Nevertheless, in 2018, not even the half of the adult population reached these minimum standards of PA (46% small children, 27% children, 19% adolescents, 46% adults, 42% older adults (WHO, 2018) (See Figure 1).

According to the first wave of the survey for children and young people in Germany by the Robert Koch Institute made in 2012, only 27.5% of children and adolescents met the recommended levels of physical activity for health, with girls being less likely (25.4%) to meet the recommended levels than boys (29.4%) (Schlack, Hölling and Kurth, 2012).

These facts about physical inactivity among German citizens are supported by a study made at Potsdam University in 2017 regarding PA among students and workers, which concludes that among students and workers of the university, the recommendation for PA (3 times per week as set in the study) was not met by 70% of the employees and 52.67% of students (Salzwedel et al., 2017).

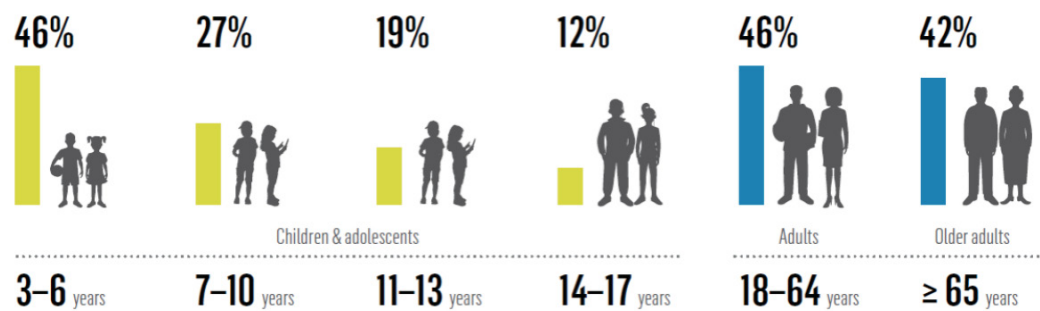


Figure 1: Estimated prevalence (%) of sufficient physical activity levels in Germany. (WHO, 2018)

4.1 Health-related behaviors in Germany and Darmstadt

This report focuses on three health-related behaviours: active recreation, active travel and social interaction, always in connection with the urban open public spaces.

Active Recreation

According to the special survey on the topic "Sports and PA" from the European Commission, German citizens appear to exercise or play sports more than the rest of the EU countries. For example, in 2013, 41% of Germans stated that they exercise or play sports with some regularity (33% for the EU) and 29% of Germans stated that they never exercise or play sports (42% for the EU) (European Commission, 2014).

In addition, 42% of the German population engage in sports and PA in open public spaces (in parks, outdoors, etc.), but most of them engage in PA or sports at home (46%). (European Commission, 2014)

In the city of Darmstadt, according to a survey in 2015, the activities that were performed the most every day during the free time of the citizens were: watching TV or listening music, internet and communication in social media and talk on the telephone. 43% of the Darmstadt's citizens perform every day activities in open spaces. 18.3% of the citizens do sports every day and 47% perform sports one or two times per week. In addition, it is interesting to note that groups of older age tend to be active more often in outdoor spaces (see Figure 2) (Wissenschaftsstadt Darmstadt, 2016).

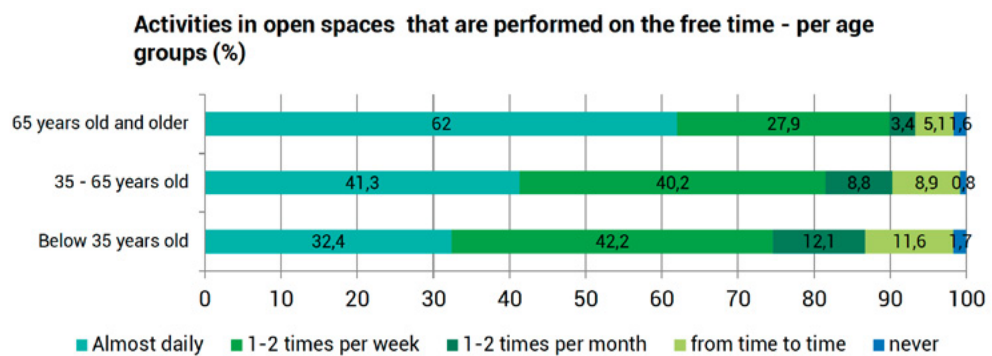


Figure 2: Outdoor Activities, city of Darmstadt, 2015. Source: Wissenschaftsstadt Darmstadt, 2016.

Active Travel

A special survey made by the EU Commission shows that Germans seem to walk more (for at least 10 min at a time) than the rest of the EU. 70% of the respondents stated that during the week before participating in the survey they walked for at least 10 minutes at a time on four to seven days of that week (European Commission, 2014). Still, the most common way of moving

is by car. Around 43% of the trips were made by car in 2017 (Follmer & Gruschwitz, 2018) (See Figure 3).

According to a survey made in 2015 among adolescents and adults (14-69 years) in Germany, the bicycle is used primarily to do excursions or shopping, secondly, to meet friends at the evening, thirdly to do sports. The fourth and fifth most stated reasons for using the bicycle are transport to the job and to go to school (Statista, n.d.).

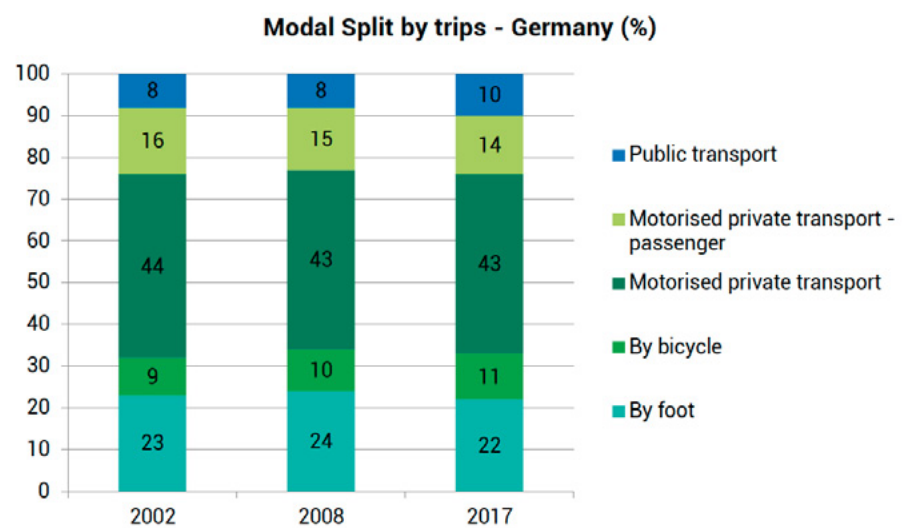


Figure 3: Modal Split by trips in Germany for 2017 (Follmer & Gruschwitz, 2018).

In the case of Darmstadt, active travel seems more prominent. Walking and bicycling in the city of Darmstadt is very popular. Almost 70% of the citizens confirm that they walk or bicycle in order to do their daily shopping and more than 45% go by foot or bicycle to sports centres (see figure 4) (Wissenschaftsstadt Darmstadt, 2016).

In the case of public transport in Darmstadt, which is closely connected to active travel, it is shown that the age group of less than 25 years including school-aged students, is the group that has the larger percentage of daily use of public transport (over 60%). Moreover, every two non-German uses public transport several times a week and about 38% almost daily. Nevertheless, with the increase of age the proportion of those who use public transport every day diminishes (Wissenschaftsstadt Darmstadt, 2016). Conclusively, active travel in Germany has potential to increase especially among elderly people and people with a German nationality.

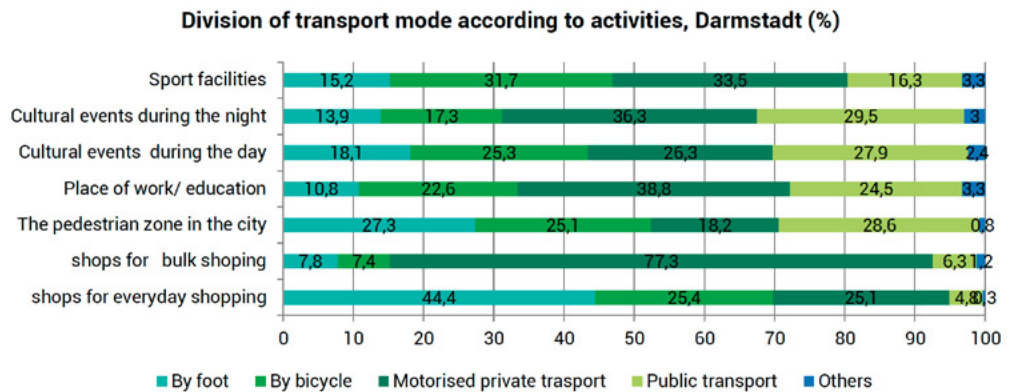


Figure 4: Division of transport mode according to activities, Darmstadt, 2015. Source: Wissenschaftsstadt, 2016.

Social Interaction

*“Being able to engage in social activities is important for an individual’s psychological balance, hence wellbeing.”
(Mercy, J.L. et al. 2015 p.134).*

According to a statistic of the European Union of 2013, Germans seem to be satisfied with their personal relationships, having a mean rating of 7.9 in a scale of 1 to 10 (See figure 5).

In addition, in 2006 about 22% of German citizens aged between 18 and 65 and 23% aged more than 65 years, participated on activities of recreational groups or organizations (Mercy, J.L. et al. 2015). Such groups may include sports groups, hobby associations or leisure clubs. In the case of Germany, it is interesting to see that age is not a determinant that reduces the participation in recreational activities as in other countries. In Germany, older people appear to enjoy and join recreational activities as much as young people.

Regarding satisfaction of life and happiness, more than 50% of the Germans state that they feel most of the time happy, 25% are sometimes happy and around 10% are rarely happy.

Although there is no statistic about the social relationships on open public spaces, the statistics mentioned above show the level of happiness and satisfaction with the social relationships, which at the same time are essential for the mental health of humans.

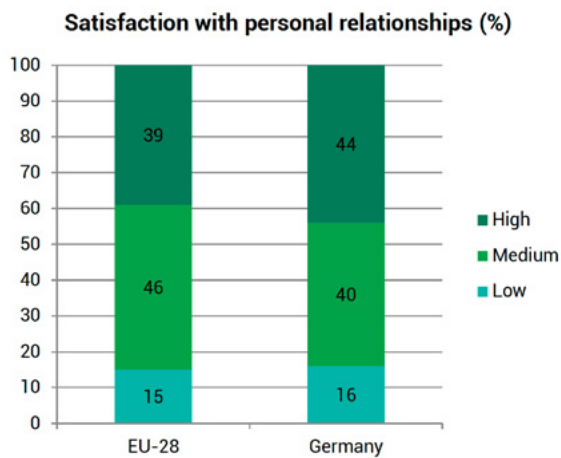


Figure 5: Satisfaction with personal relationships, by country, 2013. Source (Mercy, J.L. et al. 2015)

Concluding on the health-related behaviours in Germany, we can deduce that the numbers of trips by bicycle are slightly increasing through the years, but still most of the trips are done by private vehicle. In the case of Darmstadt, walking and cycling seems more popular, especially for small shopping trips and minor duties.

Regarding active recreation, almost the same percentage of people who exercise sports with some regularity also recreates actively in open public spaces (41% and 42% accordingly). Thus, in Germany, open public spaces tend to act as scenery for active recreation.

Concerning social interactions, Germans are satisfied with their personal relationships and more than the half of the population feel most of the time happy. Nevertheless, this report highlights the need for more research on the field of social interaction in open public spaces.

4.2 Open public spaces in Germany and Darmstadt

Germany has a territory of 357,409km² from which 7.16% are building spaces and developed open spaces, 1.27% are recreational areas (e.g. parks, zoos, and sports facilities), 5.17% are areas for traffic and infrastructure, 52.66% are agricultural areas, 31.29% are forests, and 2.44% are water surfaces (see figure 6).

According to data of 2006 provided by the Environmental Federal Office of Germany and gathered by the CORINE Land Cover (CLC), the country has 12.5m² of outdoor recreational areas per inhabitant, and 4.6m² of green areas per inhabitant. These values are similar to the average values of the EU (Umweltbundesamt, 2014).

In addition, agricultural areas, forests and water surfaces are also important in this report due to their potential to enhance positive health-related behaviours, as physical activity or social interaction. A study made along the river Rhine in Düsseldorf and Cologne (Germany) in 2015 recognizes the importance of the urban blue infrastructure because it enhances well-being and PA within the population. This study showed that the most popular activity around urban blue spaces is walking and contemplating the landscape. In addition, due to the longitudinal shape of the urban blue spaces (coast, rivers, lakes) particularly motivate people to carry out dynamic activities like jogging, walking fast, biking, etc. (Volker & Kistemann, 2015)

Regarding urban public open spaces, around 75% of German citizens agree that there are many opportunities to be physically active around the area where they live. In addition, 42% of the population engage in sports or PA in open public spaces (in parks, outdoors, etc.), but most of the Germans engage in PA or sports at home (46%) (See figure 7).

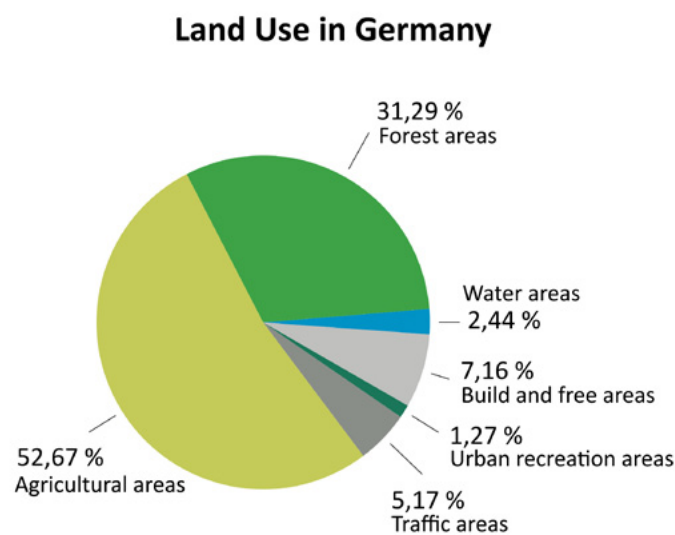


Figure 6: Division of land uses in Germany in 2015. Source: Statistische Ämter des Bundes und der Länder (n.d.)

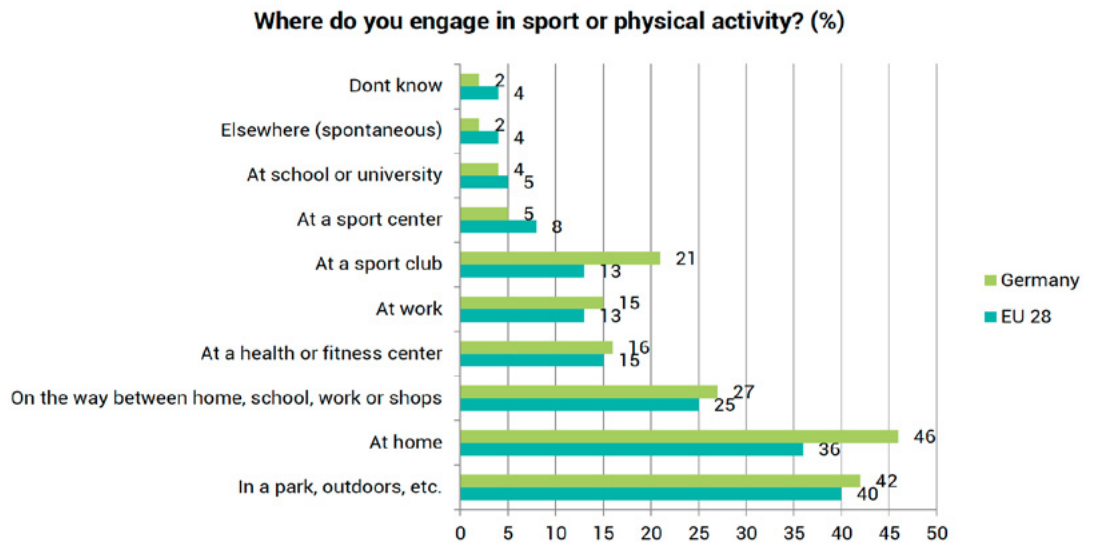


Figure 7: Places of engagement in sport or PA in Germany and EU, 2013. Source (European Commission, 2014)

The situation of green and urban open spaces in Darmstadt is positive, since the city is surrounded by a green belt covering 49% of the municipal area (Wissenschaftsstadt Darmstadt, n.d.a.). In addition, in 2012, around 1,8% of the total area of the city was dedicated to green urban areas and sport-leisure facilities (Eurostat, n.d.) (See Figure 8).

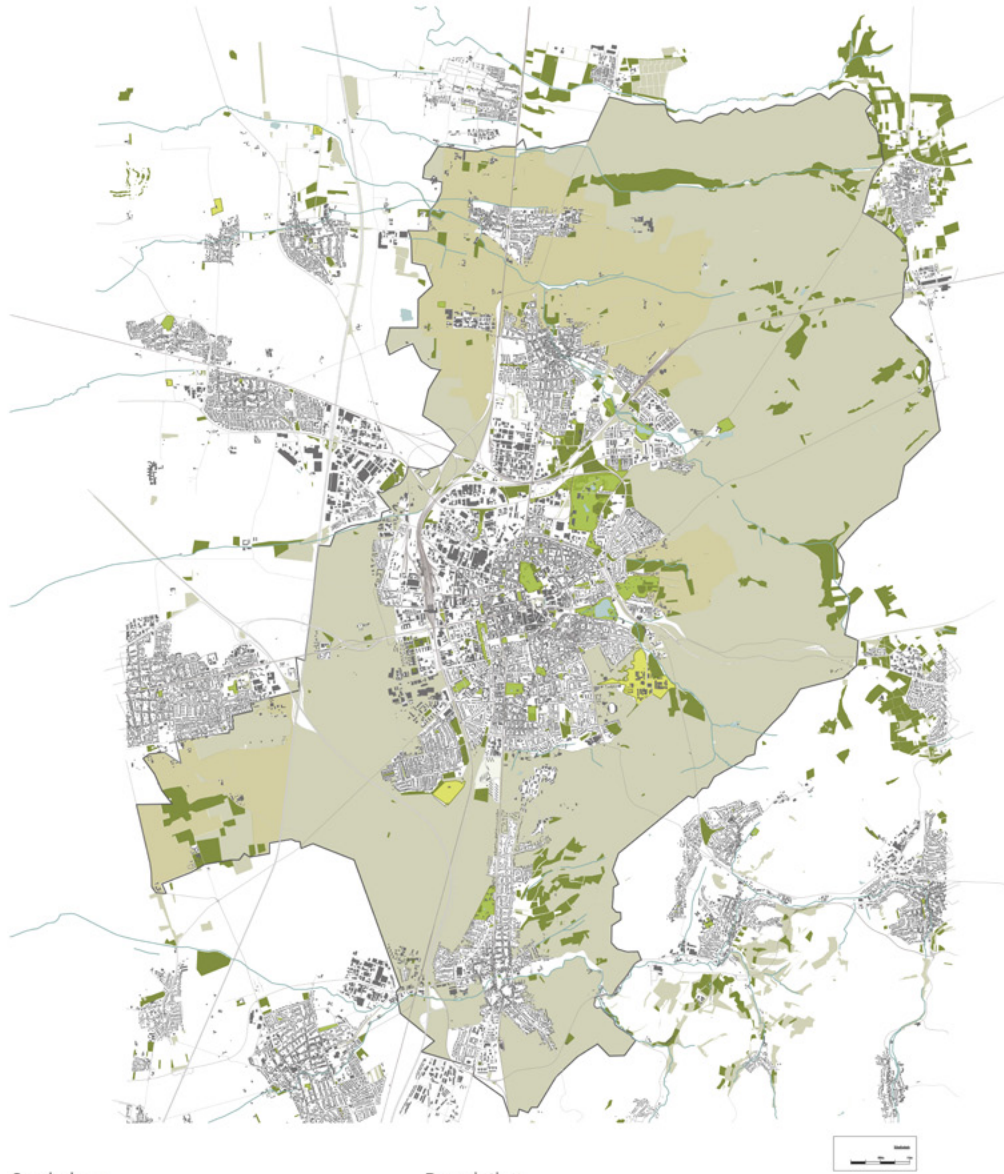
According to an online survey regarding the importance of public green spaces made by the municipality of Darmstadt in 2013, where 710 citizens participated (45% men), the majority of the respondents (more than 55%) answered that they visit the green and park areas at least three times per week. In addition, the majority of the respondents (60%) confirm that they visit green areas and parks around one hour during week days and between one and two hours during the weekend (Wissenschaftsstadt Darmstadt, 2016).

Regarding the social interaction in parks and green spaces of the city of Darmstadt, 15% of the citizens agree that they visit these spaces to be with other people (Wissenschaftsstadt Darmstadt, 2016)

Regarding active travel through the parks and green spaces of Darmstadt, only 25% of the respondents agree that they use these spaces as connection between two different spaces (Wissenschaftsstadt Darmstadt, 2016).

Blue and Green Infrastructure

City of Darmstadt (Municipality), Germany



Symbology

- Natural green areas
- Agricultural areas
- other green areas (allotments, gardens, orchards)
- Parks
- Recreational areas
- Water bodies (riverbanks, basins, lakes)

Description

Darmstadt is surrounded by a forest belt that covers 49% of the municipal area. This means that Darmstadt is one of the most forest-rich cities in Germany. In 2012, around 1,8% of the total area of the city was dedicated to green urban areas and sport-leisure facilities. Sources: Darmstadt official website and Eurostat 2014.

To know more about the project visit <https://prehealth.eu/wordpress/>

Figure 8: Map of the green and blue infrastructure in Darmstadt, own illustration. Source: Wissenschaftsstadt Darmstadt.

In addition, for Darmstadt citizens the most important features of parks are: first of all, place, maintenance and cleanliness. Secondly, trees in a good condition, and thirdly, flat lawn areas to lie down and play (see Figure 9). It is important to note here, that the question to evaluate features of parks in Darmstadt, does not even consider aspects that incentive physical activity in open public spaces, as for example: fitness objects, or fitness trails.

Assuming a new park would be planned, which elements would be particularly important to you personally?

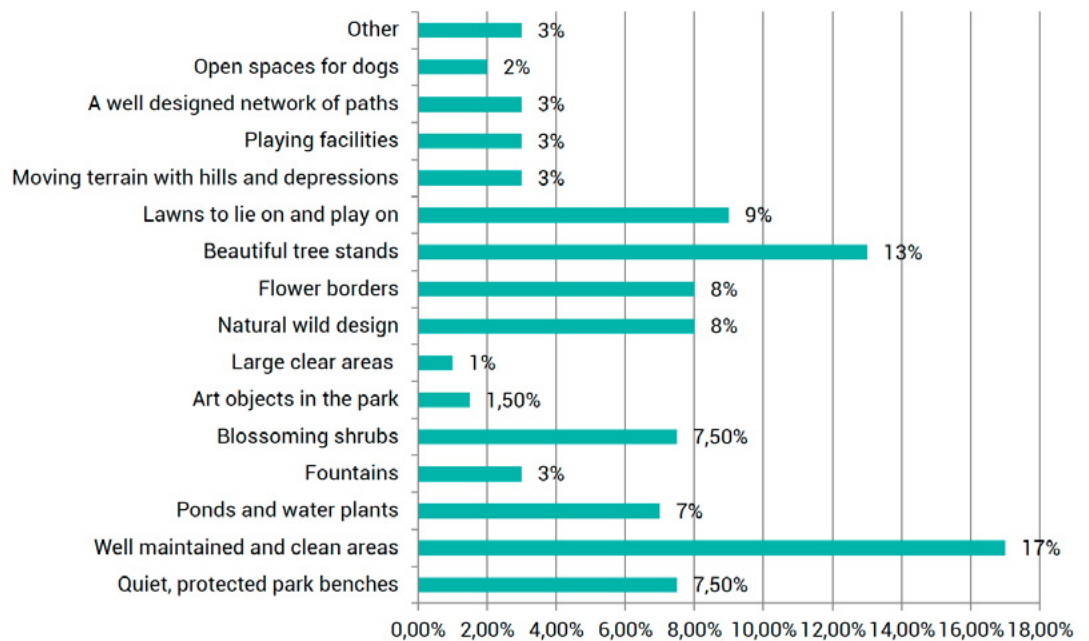


Figure 9: Citizen's important characteristics of parks in Darmstadt, 2013. Source: Wissenschaftsstadt Darmstadt (2013)

The city of Darmstadt ranks under the fifteen greenest cities in Germany, which shows a great potential due to the availability and the active use of these green spaces. Regarding active travel, the city of Darmstadt follows the country's trend: the majority of the population goes to work by car, to sport facilities by bicycle and small shopping trips are done on foot. To conclude with this section, urban open public spaces seem to be important for Darmstadt citizens who state that they visit the parks and open spaces to be active, to recreate, to meet other people or because they actively travel through them.

4.3 Policies and Practice

The following section offers an overview of policies regarding health and open public spaces in Germany and in the city of Darmstadt. This section includes insights gathered on surveys conducted with experts in the field.

Health

Germany forms part of the “Healthy Cities” movement, which is a global movement led by the WHO and the European Union forms part of it (WHO, n.d.). The goal of the movement is to put health as a priority on the social, economic and political agenda of city governments and to be committed to health and sustainable development. The two strategic goals of Health 2020 are:

- Improve health for all and reduce health inequalities.
- Improve leadership and participatory governance for health.

In this context, the Federal Ministry of Health in Germany has a national initiative to promote healthy diets and PA, called “IN FORM”, which involves work groups, ministries, scientific societies and associations, as well as individual experts in the fields of health promotion, prevention and sports (WHO, 2018).

There are three national policies related to physical activity in Germany. The sectors that are involved in each of them are: health, education and sports. Sectors as transport, environment and urban planning are often not involved (WHO, 2018). In addition, the policies and action plans that enhance health are usually addressed to: low socioeconomic groups, pregnant and breastfeeding women, migrants, older people and people with chronic diseases (WHO, 2018). The three national policies as follow:

Physical activity among elderly persons

“Germany enhances various voluntary programs that promote PA and active aging for elderly people. An example is “Balanced Ageing” (ÄlterWerden in Balance), which aims to provide information and tips for staying fit in everyday life and remaining agile throughout the ageing process” (WHO, 2015).

Physical activity at the workplace

“German statutory health insurance funds are required by law to support various ways of health promotion at the workplace. The AOK health insurance fund and General German Bicycle Club (Allgemeiner Deutscher Fahrrad-Club - ADFC) coordinate the Cycle to Work scheme (“Mit dem Rad zur Arbeit”), established in 2004. In other companies there are initiatives in place that help employees to meet the WHO recommendation to walk 10,000 steps every work day. Various other programmes exist across Germany to promote healthy lifestyles that incorporate physical activity, often led by health insurance funds” (WHO, 2015).

Physical activity in schools

“Physical education (PE) in both primary and secondary schools varies across Germany owing to the federal system, with power devolved to the local level. PE is mandatory in primary and secondary schools across all states and 3-5 hours are provided on average per week. In addition, various voluntary programmes, projects and measures for active school breaks between and during lessons exist, as well as schemes for the time after school. An example is “Make children strong” (Kinder stark machen), which was initiated in 1991 by the BZgA – Bundeszentrale für gesundheitliche Aufklärung (Federal Centre for Health Education), aiming to ensure children are robust for adult life by investing in physical activity from a young age” (WHO, 2015).

The city of Darmstadt also promotes a healthy city and forms part of a network of "healthy cities" in Germany (Gesunde Städte Netzwerk der Bundesrepublik Deutschland). Their main objectives are:

- Develop healthier living conditions and create a living environment conducive to good health
- Strengthen the responsibility of citizens for healthy living conditions
- Promote the participation of citizens in planning and design processes
- Enable the access to health policy and relevant information for all
- Connect the diverse healthy landscape in Darmstadt (Wissenschaftsstadt Darmstadt, n.d.b).

Open public spaces

According to the expert interview with the head of the Urban Planning office of Darmstadt, the city of Darmstadt has a Landscape Plan (Landschaftsplan der Wissenschaftsstadt Darmstadt), which in conjunction with the program "25 steps to the biological diversity in Darmstadt" (25 Schritte zur biologischen Vielfalt in Darmstadt), helps to integrate all the open public spaces in the city. In addition, Darmstadt is in the process of creating the Masterplan 2030, which includes a new mobility concept foreseeing the expansion of bicycle lanes and sidewalks for pedestrians (Krehbiehl, 2017).

The city of Darmstadt was planning to host the State Garden Show (LGS) in 2020, as an integrated attempt to showcase best practices of open green space and urban development, which recently had to be cancelled due to the lack of economic resources. Nevertheless, there still remains an urban renovation project called "StadtumbauOst" which started in October 2016 and the objectives are: to improve the public spaces, to connect the blue and green infrastructure, to upgrade the residential environment and to modernize the area. This project should be realized by 2030.

According to the expert interview with the leader of the Green Areas Department of Darmstadt, there are two instruments that are used when managing new open spaces in the city: the land use plan and the zoning plan. Nevertheless, the expert expresses that "an extension of existing green spaces is usually not possible, because the space is not available. However, the green space system is expanded gradually through the development of new building zones" (Fath, 2017).

Regarding the planning of open spaces and the promotion of health, the expert mentioned that the planning of green and open areas have to be multifunctional, offering a great amount of activities for all users (especially in sports and playing features), and has to be easily accessible. Bicycle lanes through parks and open spaces are not being promoted by the authorities due to the arising conflict between cyclists and other users of the space. In addition, the expert mentions that in the past, there was an effort to approach health together with a work group, different offices and health organizations (health insurance companies, associations, institutions) but the work was discontinued for reasons of capacity (Fath, 2017).

In conclusion, more cooperation between different departments, institutions and the civil society is needed to achieve better results. Through the information of the expert interviews, we could detect a lack of cooperation between the instances related to open spaces and the instances related to health.

Discussion

As described on the chapter "Challenges", Germany and as well the city of Darmstadt, have to face many different obstacles to overcome unhealthier behaviours on the population. In addition, the risk of losing green urban areas to build or develop them is present in almost every city. The present report represents the actual literature and the status in numbers regarding active recreation, active travel, and social interaction, specifically in relation to open public spaces (green and blue infrastructure). Nevertheless, this report highlights and discusses the lack of connection between these both categories: the behaviour of the population and the space. This disconnection is perceived at all levels: academic literature, planning practices and policy. For example, at the academic level, there is a huge gap in research between social interaction and open public spaces in Germany. At the planning field, the connection between active travel, specifically bicycling, and the open public space is not desired and supported due to conflicts between users, although research shows the benefits to cycle through green spaces. At the policy level, we also see a poor connection and lack of communication between different sectors, where transport, environment and urban planning sectors are always ignored in health policies. As an example, the institution who creates policies about health in the city of Darmstadt does not consider the policies of the institution in charge of green spaces in the city and vice versa. Therefore, this report points out the poor connection of these two important topics and refers to the International Synthesis Report PREHealth where it is highlighted the relation and the relevance between these two topics, showing with some cases, the benefits that this connection can bring.

Conclusion

Regarding the health-related behaviours set out in the PREHealth project, German citizens tend to use open spaces frequently, exercise or do sports, walk and bike more than the European counterparts, except the Netherlands and Scandinavian countries. Statistics of the European Union show that German citizens, in comparison with the rest of the EU, engage more in PA and active travel for recreational purposes. On the other hand, statistics from the WHO also show that more than half of the adult population and more than three-quarters of the children do not meet the minimum standards of PA recommended by the WHO. There is a discrepancy on the data due to the different methods to ask and measure PA. Nevertheless, the data published by the WHO alarms and calls for action in Germany as well as the rest of the EU countries.

It is important to highlight that in Germany, the adult population enjoys and participates as much as the young people on recreational activities and visits the open public spaces more often. In general, Germans seem to be satisfied with their lives and relationships, which shows that the community has good levels of social interaction. Nevertheless, more research on the social interaction of the citizens with their different socio-economic background and the role of open public spaces is needed.

Open public spaces in Germany seem to be important and are often used by the citizens. Still, in Germany the trend of increasing urbanization is existent, as in the rest of the world. This trend threatens the open public spaces and their accessibility, which are already difficult to extend due to the lack of available space in inner city areas. New open public spaces can be only allowed through a master plan or a plan with a similar importance.

It is important to notice that, although there is accessible information and statistics about the health of the citizens, there is a lack of information about specific behaviours of the citizens (especially regarding social interaction) in open spaces. For example: the number of women, men and children on parks and the specific activities they engage in. More research is needed on this area in order to understand the usage of these spaces and to plan future spaces with health in mind.

It is imperative to call for more cooperation between different institutions and bodies to achieve better results on the field of urban planning and health. Although there are good policies and practices coming from the urban planning and health departments, more cooperation would widen the perspective on the topic and deliver efficient results on the problem of health behaviours and open spaces mentioned above.

Germany as well as the city of Darmstadt form part of movements that promote healthy cities. Therefore, policies engaging the most vulnerable population (elderly, people working in offices, and children) exist. Yet, numbers and statistics show that females in general are a group at risk of having unhealthy behaviours, and no specific policies are being implemented to tackle this problem.

Conclusively, this report aimed to give an overview of the situation of health-related behaviours and the open public spaces in Germany and in the city of Darmstadt. It shows that more research on the topic and more cooperation between institutions when planning is needed.

Appendix I - Glossary

Active travel

Moving to a fixed destination with the help of your own muscle power, e.g. walking, cycling or skateboarding to work.

Active recreation

Activities engaged in for the purpose of relaxation, health and well-being or enjoyment (i.e. other than work) in which physical exertion is required, e.g. sports, dancing, gardening or play.

Blue infrastructure (in urban areas)

Comprises all surface waters within a city (e.g. lakes, rivers, coastal water) (Volker & Kistemann, 2015).

Green infrastructure

An interconnected network of green space that conserves natural ecosystem values and functions, and provides associated benefits to human populations (Coutts & Hahn, 2015).

Health-related behaviour

Any activity undertaken for the purpose of improving health and wellbeing or for preventing and detecting disease, e.g. exercising regularly, eating a balanced diet, and obtaining necessary vaccinations.

PREHealth focuses on the health-related behaviours *active travel*, *active recreation* and *social interaction*.

Urban open space

All areas not developed by buildings. Particularly important for PREHealth are green and blue open spaces such as parks, greened road and path networks, squares, bodies of water, etc.

Physical activity

According to the World Health Organization physical activity can be defined as any bodily movement produced by skeletal muscles that require energy expenditure.

Social interaction

Action and communication related to fellow human beings/groups in everyday, public and private situations (Korte & Schäfers, 2010).

Appendix II – Expert Interview Questionnaire

PREHealth

Promoting Education and Jobs to enhance the Use of
Urban Blue and Green Infrastructure for Health and Fitness

IO 01 State of the Art, Germany

Expert Interview

1. Please provide us with your name, institution, department and your function and experience in that function.
2. What are the responsibilities of your department in relation to open spaces? What is the distribution of roles in relation to the development of open spaces between units?
3. What are the legal bases for open spaces? What are your department's guidelines for the development and management of open spaces? What programs are currently being implemented or planned?
4. What projects are planned for the redevelopment or rehabilitation of open spaces?
5. Are there plans to extend or qualify green spaces? What is the connection between this project and a subsequent densification?
6. What plans / programmes are there to create a better network of public spaces / open spaces? (e.g. pedestrian route plan, etc.)
7. What role do „compensation areas“ and conversion projects play? What scope do you have to develop new green spaces / public spaces / open spaces? What role does cooperation play with other private or public institutions that own publicly accessible open spaces? (e.g. TU Darmstadt Campus Lichtwiese). What are your experiences in such cooperations?
8. What significance do „active“, health-promoting uses have in the planning of open spaces? Which uses have priority (e.g. active commuting by bicycle)? How important is health promotion in your department? What are the interfaces with other departments? (Question 1) Is there planning for a superordinate, interdisciplinary organisational unit on the subject of „health-promoting cities“?
9. Is there a good example of physically active, health-promoting use of open spaces that you would like to highlight?

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