



Relationship between distance to and use of green space, physical activity and health-related quality of life – Results from a Danish national representative survey

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FOREST & LANDSCAPE

Forest & Landscape Denmark is an independent centre at the University of Copenhagen (UC).

The Centre undertakes research, education, extension and consultancy services in the area of forest, landscape and planning.



National Institute of Public Health, University of Southern Denmark.

The institute aims to take part in the process towards better public health and a better health care system through research and reviews.





The Health and Morbidity Survey 2005

The Danish National Institute of Public Health, has carried out nationally representative health interview



New: Three questions concerning use of green space

in health and morbidity in the Danish adult population (16 years or older) and in the factors that influence health status, including health behaviour and health habits, lifestyles, environmental and occupational health risks and health resources.



Why I?



Why I?

For the first time in history most humans live in urban areas.

In developed countries about 75% of the inhabitants live in dense urban areas.

This situation leads to new demands on cities as well as on citizens.

One consequence is that people's outdoor life and recreation to a larger extent than ever before take place in urban contexts.

Why II?

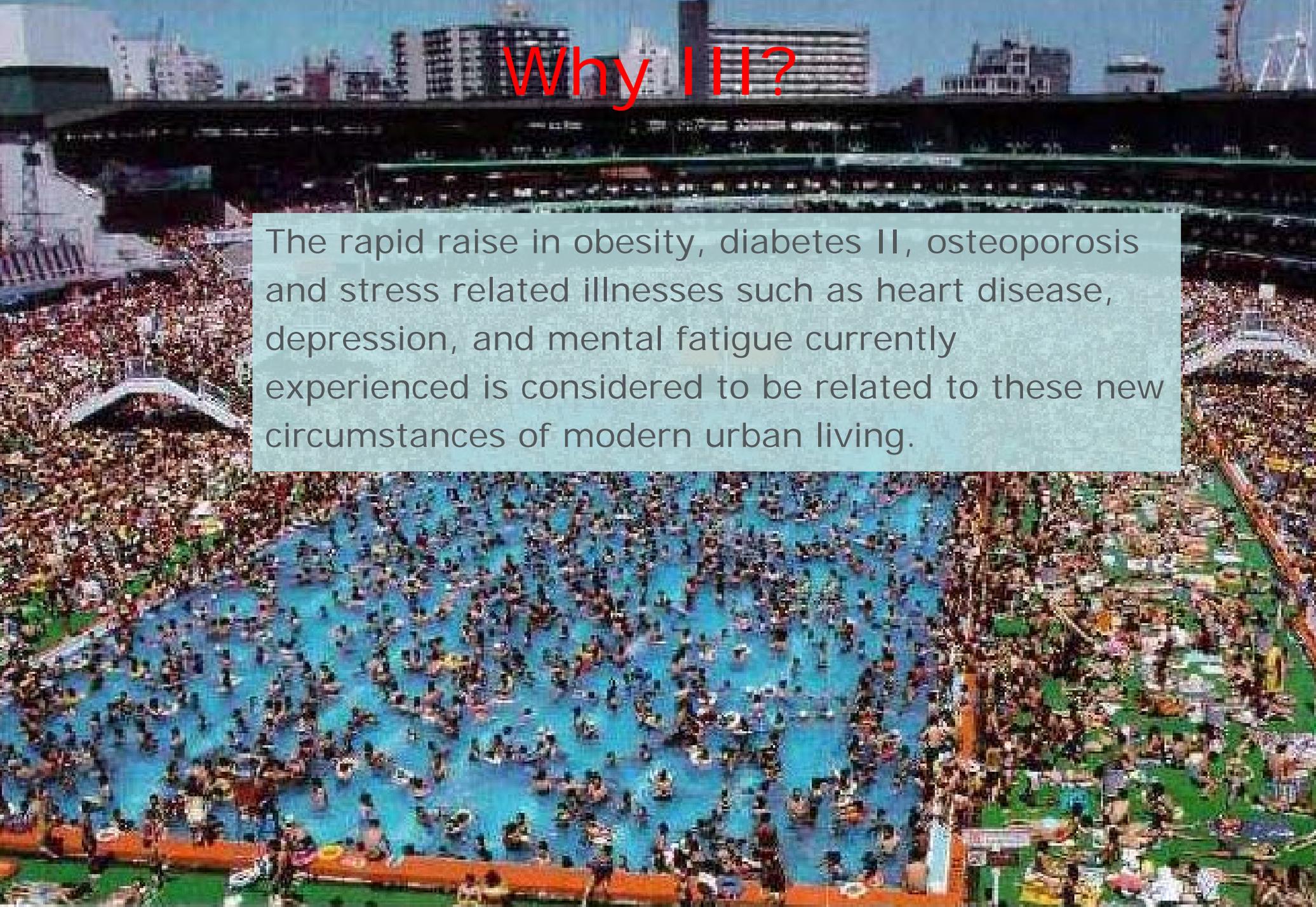
Due to the increased number of people moving to cities, urban green spaces are under the constant threat of being transformed into new infrastructure and housing areas, resulting in a dense city with fewer places out of doors for physical activity and mental restoration.

Why III?



Why III?

The rapid raise in obesity, diabetes II, osteoporosis and stress related illnesses such as heart disease, depression, and mental fatigue currently experienced is considered to be related to these new circumstances of modern urban living.





1. The respondents were asked about the distance from their home to nearest green space.

The possible answer categories were:

- <300 meters
- 300 meters
- -<1 kilometer
- 1-<5 kilometers
- ≥ 5 kilometers





2. The respondents were asked about the distance from their home to each of the following types of green space

- Beach, sea, lake
- Park, green space
- Forest
- Other open natural area

(In the present study, all types of nature environments are grouped into one variable, called *green space*.)





3. The respondents were also asked about the frequency of use of the different green spaces

- Daily
- Several times per week
- Weekly
- Monthly
- Seldom or never





Methods I:

Data was derived from the Danish Health and Morbidity Interview Survey in 2005 and is based on a region-stratified random sample of 21,832 adults.





Methods II:

Data was collected via face-to-face interview (14.566 individuals; 66.7%) followed by a self administered Questionnaire (11.238 individuals; 77.1%).

Multiple logistic regression analyses were performed to investigate the associations.





2 perspectives and parts:

Part I. Physical activity and obesity



Part II. Health and stress





Part I: Why is physical activity important?

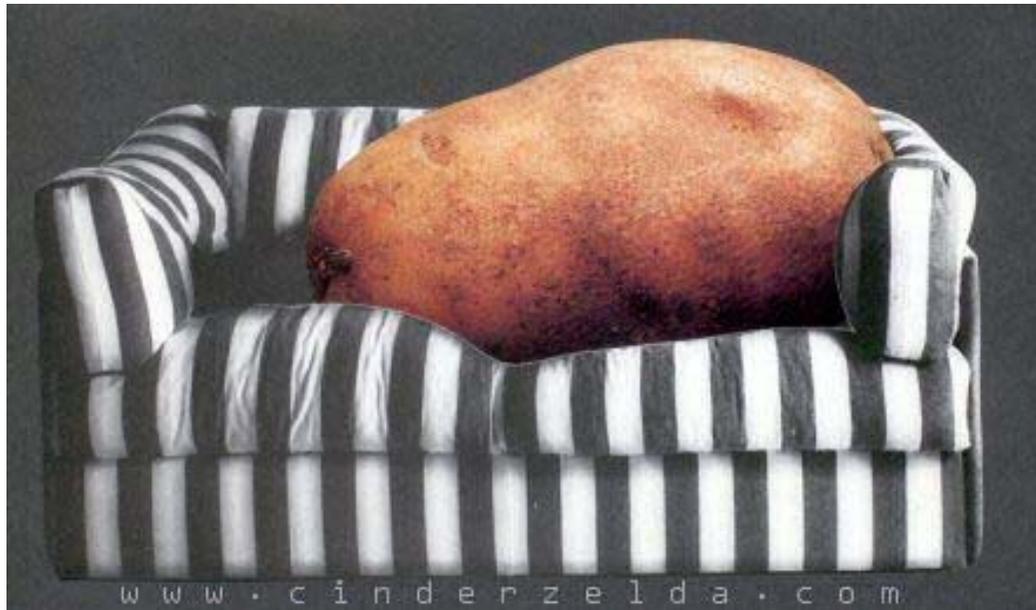
Regular physical activity has shown to reduce:

- overall mortality
- chronic diseases (e.g. coronary heart disease, type 2 diabetes, high blood pressure, colon cancer, obesity)
- mental ill-health .





Due to increasingly sedentary jobs and an increased reliance on motorised transport, leisure time physical activity may be important in fulfilling recommended levels of physical activity.





The questions underlying the study are:

What is the relation between distance to green space and:

- physical activity in green space?
- moderate/heavy physical activity in leisure time?
- Obesity (BMI > 30)?





Face-to-face interview: Physical activity in leisure time

If we look back at the past year, what would you say best describes your leisure activities?

(Show card 12)

Heavy exercise and competitive sports regularly and several times a week	1	4.1
Exercise or heavy gardening at least 4 hours a week	2	22.4
Walking, biking or other light exercise at least 4 hours a week (include Sunday excursions, light gardening and cycling or walking to work)	3	59.6
Reading, watching TV or other sedentary activity	4	12.9
No information		0.5
Do not know		0.5

→ were combined to create an overall measure of moderately or vigorously active in leisure time

The National Health Interview Survey, The National Institute of Public Health





Face-to-face interview: Body Mass Index

Self-reported height and weight in the face-to-face interview were used to calculate Body Mass Index (BMI)

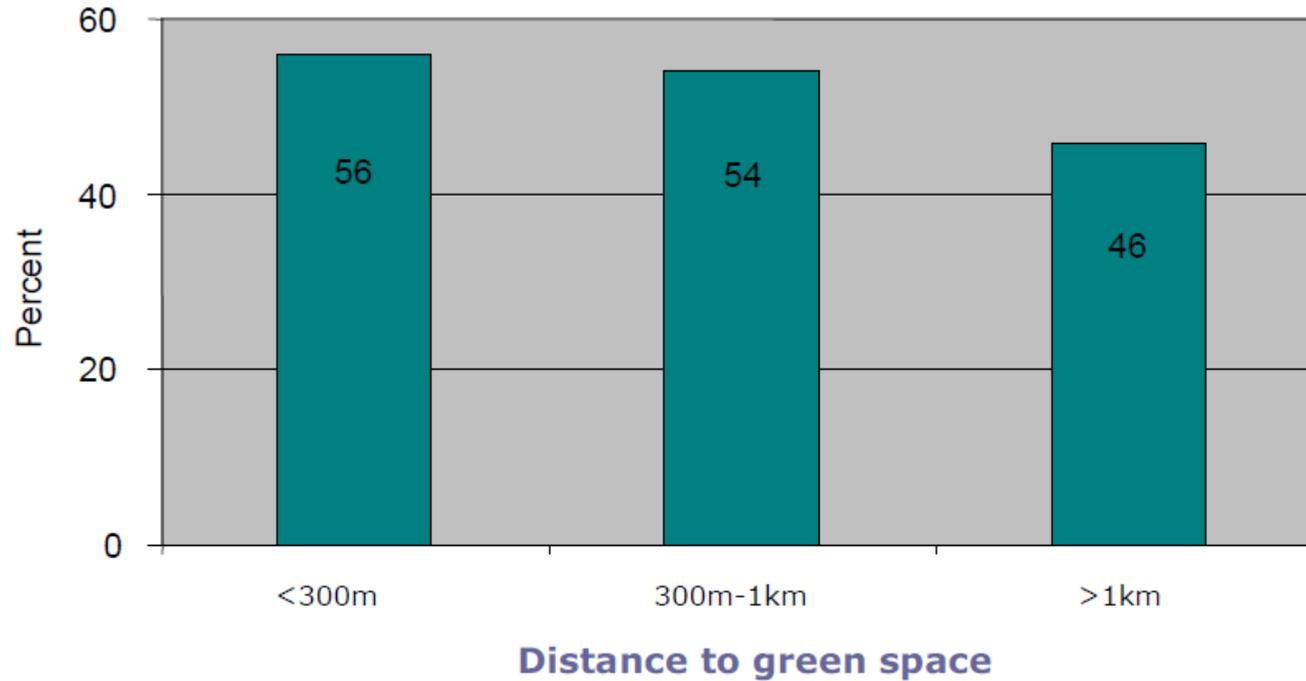
(weight in kg/height in m²).

A BMI index of 25 or more is the threshold for being overweight and 30 is the threshold for being obese





Result 1: Relation between being physical active in green space and distance to green space



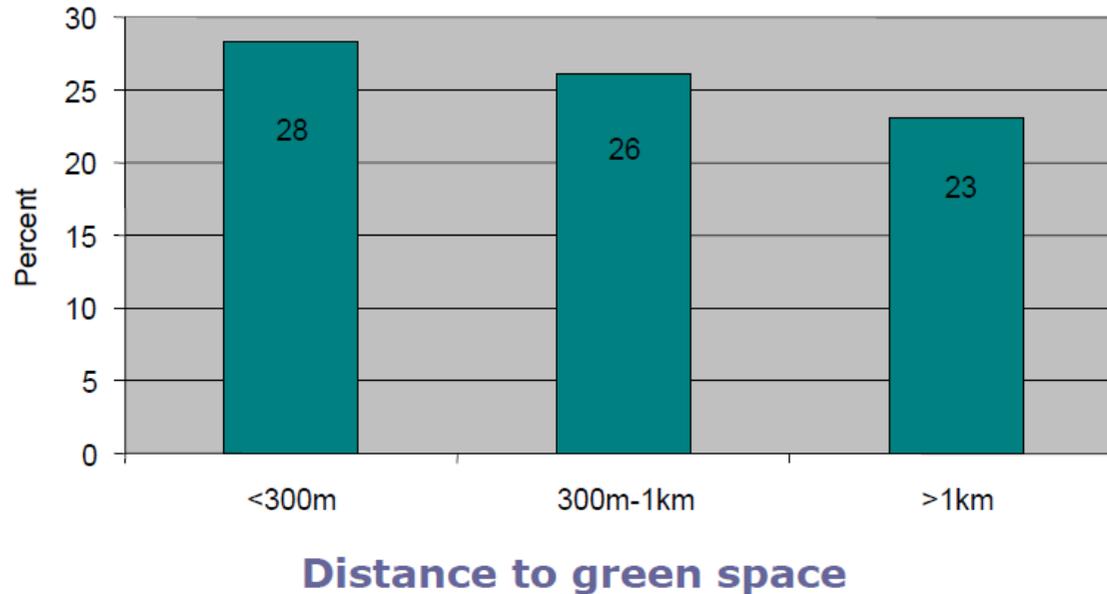
adjusted for gender, age, education, accomodation type, size of municipality, and long-standing disease

Distance to green space is negatively related to physical activity in green space. Respondents living more than one kilometre from green space had lower odds of being physically active in green space compared with persons living closer than 300 metres to green space (OR: 0.70; 95% CI: 0.60-0.83).





Result 2. Moderate/heavy physical activity in leisure time



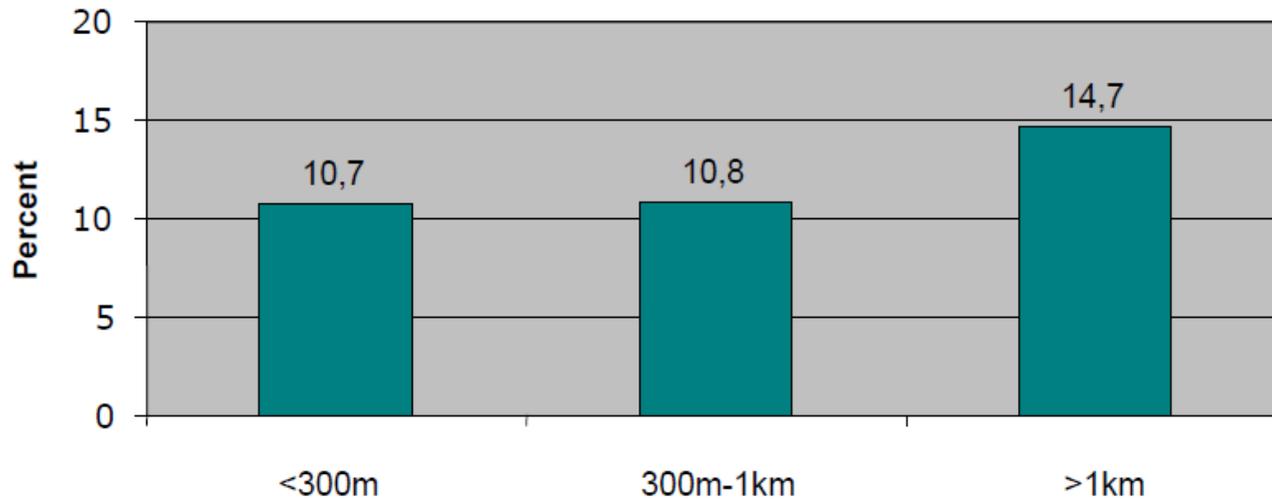
adjusted for gender, age, education, accomodation type, size of municipality, and long-standing disease

Respondents living 300m-1km from green space were less likely to be moderate/heavy physical active in leisure time compared to those living <300m to a green space. OR: 0.88 (95% CI: 0.79-0.98)





Result 3: Obesity ≥ 30 and distance to green space



Persons living more than one kilometre from green space had higher odds of being obese (BMI \geq 30) than those living less than 300 metres from green space

(OR: 1.36; 95% CI: 1.07-1.71). (adjusted for gender, age, education, accommodation, size of municipality, and long-standing disease)



Bonus slide - Facts



Bonus slide - Facts

- 66.9% of the respondents live within 300 metres of any type of green space
- 53.5% reside within 300 metres of a park - which is the most common green space to have nearest to one's home
- 15.3% have to travel more than one kilometre to their nearest park
- 81.1% of all daily users of parks live within 300 metres
- 43.0% of the respondents visit green space every day
- 2.0% visit green space seldom or never
- Forest is the type of green space with the lowest frequency of visits 11.0% visit it daily, while 17.1% stated that they visit it seldom or never



Part II: 3 questions on health and stress

- Is there an association between health-related quality of life as measured by SF-36 and self-rated health and the distance from the individuals' home to nearest green space?
- Is there an association between distance from the individuals' home to green space and stress?
- Do the reasons for visiting green space differ depending on whether individuals suffer from stress or not?





Is an instrument that measures eight dimensions of health:

1. Bodily pain
2. General health
3. Mental health
4. Physical functioning
5. Role limitation due to emotional problems
6. Role limitations due to physical health
7. Social functioning
8. Vitality

SF-36(tm) Health Survey

Instructions for completing the questionnaire: Please answer every question. Some questions may look like others, but each one is different. Please take the time to read and answer each question carefully by filling in the bubble that best represents your response.

Patient Name: _____
SNR#: _____ Date: _____
Person being to complete this form: _____

1. In general, would you say your health is:

- Excellent
- Very good
- Good
- Fair
- Poor

2. Compared to one year ago, how would you rate your health in general now?

- Much better now than a year ago
- Somewhat better now than a year ago
- About the same as one year ago
- Somewhat worse now than one year ago
- Much worse now than one year ago

3. The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

a. Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports.

- Yes, limited a lot.
- Yes, limited a little.
- No, not limited at all.

b. Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf?

- Yes, limited a lot.
- Yes, limited a little.
- No, not limited at all.

c. Lifting or carrying groceries.

- Yes, limited a lot.
- Yes, limited a little.
- No, not limited at all.

d. Climbing several flights of stairs.

- Yes, limited a lot.
- Yes, limited a little.
- No, not limited at all.

e. Climbing one flight of stairs.

- Yes, limited a lot.
- Yes, limited a little.
- No, not limited at all.

f. Bending, kneeling or stooping.

- Yes, limited a lot.
- Yes, limited a little.
- No, not limited at all.

SF-36



- . Range from 0 to 100
- . Higher scores indicate better health and health-related quality of life



Self-rated health was assessed with the question:

'In general, would you say your health is' with five answer categories:

- Really good
- Good
- Fair
- Poor
- Very poor





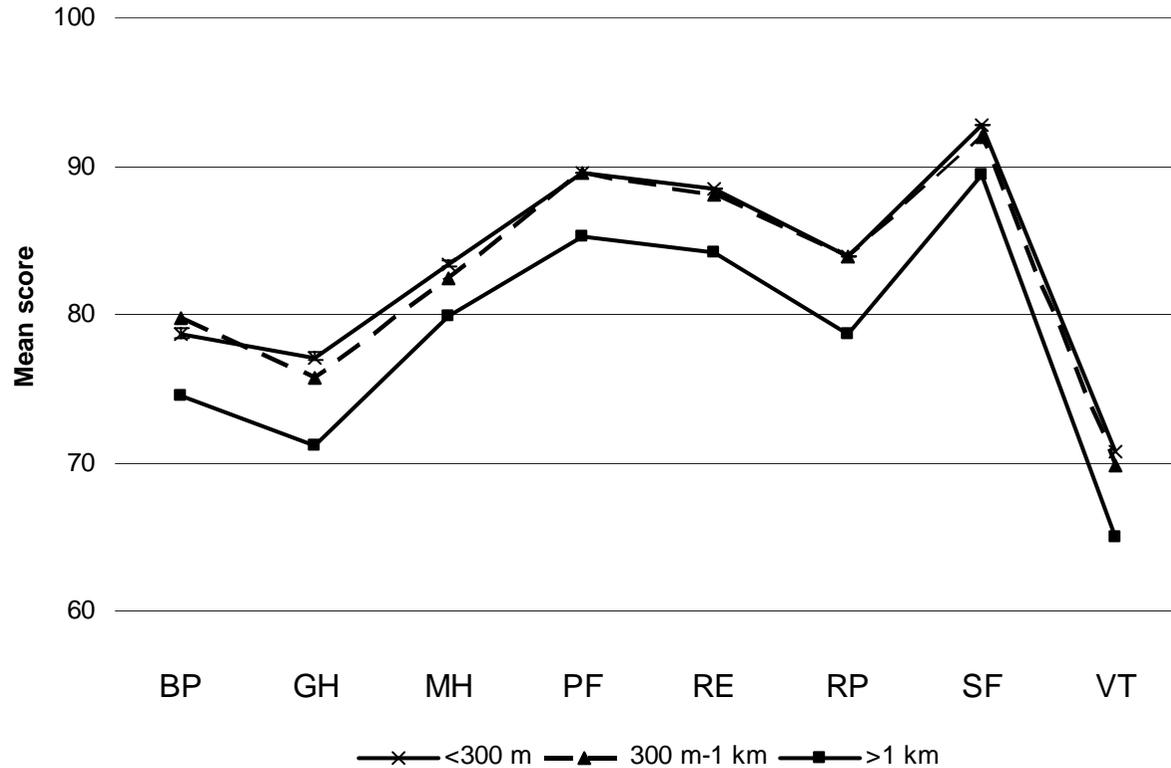
The Perceived Stress Scale (PSS)

- It is a measure of the degree to which situations in the respondents' life are considered as stressful
- Items were designed to tap how unpredictable, uncontrollable, and overloaded respondents find their lives
- The PSS also includes a number of direct queries about current levels of experienced stress
- The PSS scores range from 0 to 40, where higher scores indicate more perceived stress.





Result 4; SF-36



Relation between health and health-related quality of life and distance from one's home to nearest green space

Individuals living more than one kilometer from green spaces have lower mean scores in all eight subscales than individuals living closer than one kilometer from green spaces.

Figure 1. BP: Bodily Pain; GH: General Health; MH: Mental Health; PF: Physical Functioning; RE: Role Emotional; RP: Role Physical; SF: Social Functioning.





Result 5. Self-rated health

This analysis showed that 82.1% of the individuals living less than 300 meters from green space reported that they had a 'really good' or 'good' self-rated health compared with 72.4% among individuals living more than one kilometer from green space.





Table 1. Mean scores (standard deviations) of the Perceived Stress Scale (PSS).

	Mean (SD)	n
Total	11.0 (5.9)	10.250
* p < 0.05		
Men	10.2 (5.7)	4.802
Women	11.7 (6.1)	5.448
Age*		
16-24 y.	12.0 (6.1)	886
25-44 y.	11.1 (5.9)	3.520
45-64 y.	10.8 (5.8)	4.058
65+ y.	10.9 (6.1)	1.786
Combined school and vocational education*		
<10 y.	12.7 (6.2)	1.218
10-12 y.	11.5 (6.0)	2.756
>=13 y.	10.5 (5.7)	5.999
Distance to green space*		
<300 meters	10.8 (5.8)	6.931
300 meters-1 kilometer	11.1 (6.0)	2.630
>1 kilometer	12.3 (6.4)	602
Frequency of visits to green space*		
Daily	10.5 (5.7)	4.446
Several times a week	10.7 (5.8)	3.023
Weekly	11.7 (6.0)	1.850
Monthly/seldom or never	12.8 (6.7)	810

*p<0.05

Result 6. Number of visits to green space and relevance of distance to stress

- The overall mean PSS score was 11.0 and the mean score is somewhat higher for women than for men (11.7 vs. 10.2).
- The more often Danes visit green space the less stressed they are.
- The longer the distance is from the respondents' home to the nearest green space the more stressed they are.





Result 7: The association between stress and distance to green space

Table 2. Results from a multiple logistic regression analysis showing the association between stress (PSS>=16) and distance to green space.

	OR ¹	95% CI	n	P
Distance to green space.				0,002
<300 metres	1		6.931	
300 metres-1 kilometre	1,03	(0.92-1.16)	2.630	
>1 kilometre	1,42	(1.17-1.73)	602	

¹Adjusted for gender, age, combined school and vocational education, cohabitation status, accommodation type, size of municipality and ethnic background.

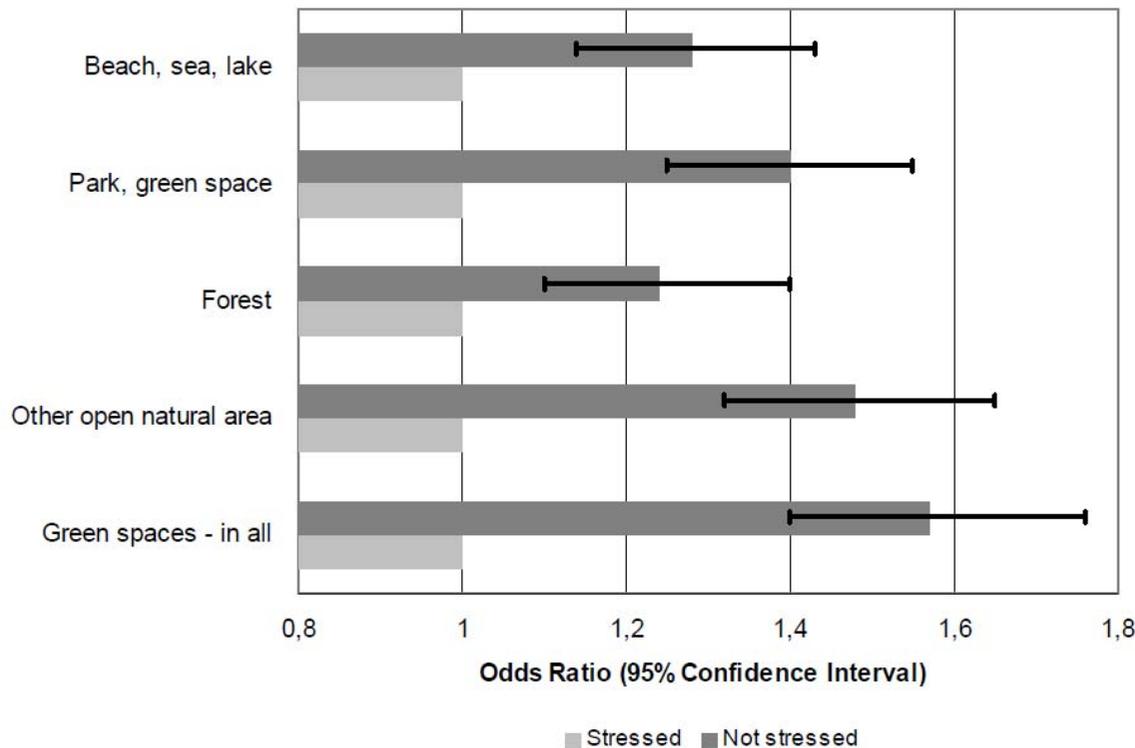
Danes living more than one kilometer away from green space have 1.42 higher odds of being stressed than individuals living less than 300 meters from green space.





Result 8: The association between visits to green space at least a few days a week and stress

Figure 2. Results from multiple logistic regression analyses¹ showing the association between visits to green spaces/natural areas at least a few days a week (between 1 April and 1 October) and stress.



Danes who are not stressed have 1.57 higher odds of visiting green space at least a few days a week compared to persons reporting stress.

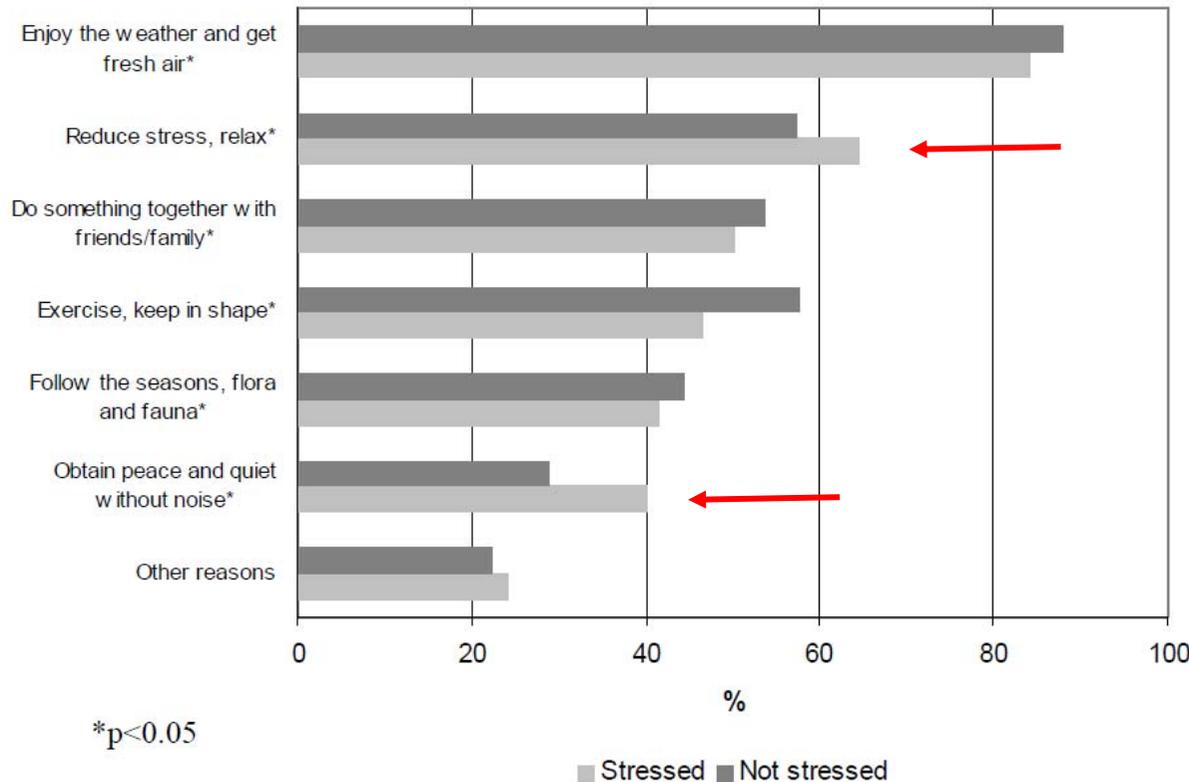
¹Adjusted for gender, age, combined school and vocational education, cohabitation status, accommodation type, size of municipality, distance to green spaces or natural areas, ethnic background and distance to green/natural areas.





Result 9: Reasons for visiting green space differ significantly whether people are stressed or not

Figure 3. Gender- and age adjusted prevalence of reasons for visiting green space according to stress status.



A higher percentage of stressed persons than not stressed reported that the most important reasons for visiting green space were to 'reduce stress/relax' and to 'obtain peace and quiet without noise'





Bonus slide: Who is physical active in green space?

Women (58%)

Elderly people (+65 y)

Long education (+13 y)

People living in a house



Conclusions



Conclusions part 1

Distance to green space is related to self-reported physical activity and obesity.

To exercise and keep in shape is an important reason for visiting green space, and distance to green space is associated with moderate/vigorous physical activity in leisure time.

Green space is an important setting for physical Activity.

Conclusions part II

An association between distance to green space and health and health-related quality of life was found in a Danish representative population.

The results indicate awareness among adult Danes that green space may be of importance to reduce stress and that green space can play an important role as public health-promoting environments.



Den 1. nationale Natur & Sundhedskonference i Danmark

Fra verdens viden til praksis i Danmark

25. - 26. november 2009



Interessen for naturens indvirkning på sundheds- og rehabiliteringsprocesser er i de senere år øget markant. Det bliver således mere og mere almindeligt at se den vilde natur og specialdesignede terapihaver som vigtige redskaber til at øge folkesundheden og til pleje af forskellige patientgrupper.

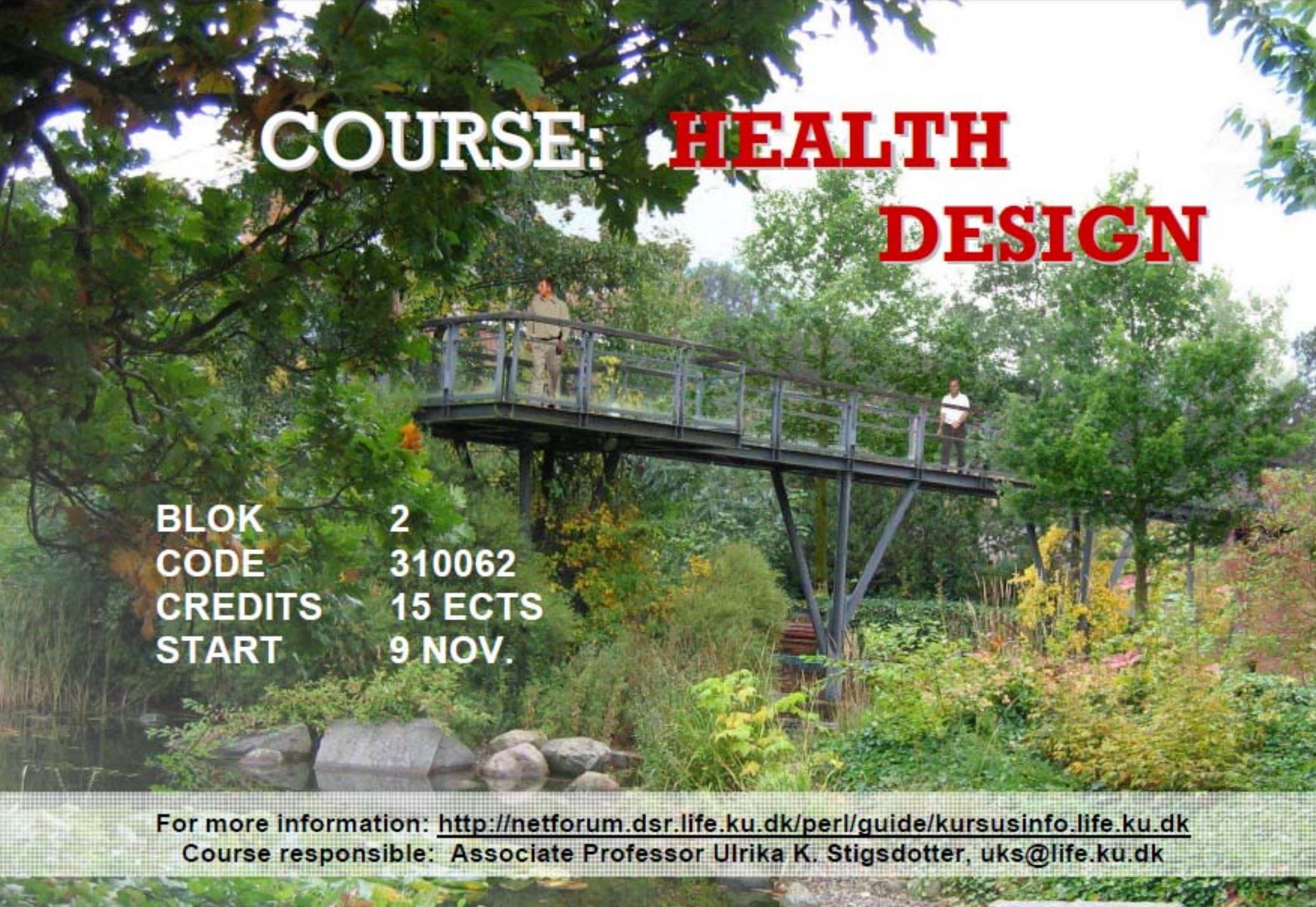
På konferencen kommer nationale og internationale, anerkendte forskere og praktikere inden for folkesundhed, miljøpsykologi, planlægning, landskabsarkitektur samt natur og sundhed, for at formidle den seneste viden inden for feltet, ligesom interessante satsninger fra danske kommuner også præsenteres. Konferencen er primært rettet mod kommuner, praktikere og privatpraktiserende inden for både »den grønne« og »den hvide« sektor, men også mod ph.d.-studerende.

Konferencen har tre primære formål:

- At præsentere aktuelle internationale og nationale erfaringer, forskningsresultater og teorier om hvordan og hvorfor naturen og andre grønne områder kan bidrage til positive helseprocesser for folkesundheden, som siden kan implementeres i det daglige arbejde.
- At skabe et forum for »de grønne« og »de hvide« målgrupper til fremtidigt tværgående samarbejde.
- At tilbyde et ph.d.-seminar for nordiske ph.d.-studerende med fokus på, hvordan man måler effekter af natur og sundhed.



COURSE: **HEALTH DESIGN**



BLOK 2
CODE 310062
CREDITS 15 ECTS
START 9 NOV.

For more information: <http://netforum.dsr.life.ku.dk/perl/guide/kursusinfo.life.ku.dk>
Course responsible: Associate Professor Ulrika K. Stigsdotter, uks@life.ku.dk