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Information om sökande

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Information om ansökan

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Antal år för projektet*

3

Beräknad projekttid*

2019-12-01 - 2022-11-30

Projekttitel (svenska, max 200 tecken inklusive mellanslag)*

Hälsofrämjande miljöer för en åldrande befolkning – en register och GIS-studie för att undersöka samband mellan gröna och bullerfria närområden och nyttjande av hemtjänst och särskilt boende

Projekttitel (engelska, max 200 tecken inklusive mellanslag)*

Health promoting environments for an aging population – a register and GIS study to assess effects of urban green and low-noise neighborhoods on social service and nursing home use

Populärvetenskaplig beskrivning (svenska, max 4 500 tecken inklusive mellanslag)*

Sveriges befolkning blir allt äldre. Detta innebär inte bara att antalet äldre (65 år eller mer) personer ökar, utan också att andelen äldre i förhållande till befolkningen i övrigt blir större. Detta kommer att öka trycket på samhället vad gäller att ta hand om de äldre som inte klarar sig på egen hand. Redan idag saknar ett flertal kommuner plats på äldreboende för dem som behöver det. För att kunna stötta de äldre behövs en förstärkning inom äldreomsorgen, som utgörs av tjänster som utförs enligt Socialtjänstlagen, s.k. hemtjänst. Samtidigt är det viktigt att identifiera faktorer som gör att äldre kan klara sig på egen hand längre, och med mindre hjälp när hjälp väl behövs.

Flera tidigare studier har visat att den omgivande miljön kan ha åtskilliga positiva effekter på välmående och hälsa. Bl.a. har man sett att personer som har tillgång till gröna områden, som t.ex. parker, har bättre fysisk och psykisk hälsa än personer som inte bor nära sådana områden. Man vet också att tillgång till gröna miljöer ökar individens fysiska aktivitet och sociala interaktioner, något som är välkända faktorer för god hälsa. Även buller från omgivningen, t.ex. från närliggande vägar, påverkar både det fysiska och psykiska måendet. Det finns därför anledning att tro att boende i miljöer med mycket grönt och lite buller skulle kunna påverka hälsan hos äldre individer till det bättre, och att de därmed i mindre utsträckning skulle behöva hemtjänst.

I den aktuella studien kommer vi att studera alla individer boende i Malmö och Kristianstad, och som är 65 år eller äldre. Med hjälp av geografiska informationssystem (GIS) kommer vi att kunna se om dessa personer har nära till ett grönområde, och hur stor del av närområdet kring deras bostad som består av grönska. För de personer som bor i Malmö kommer vi dessutom att kunna skatta bullernivåerna vid bostaden utifrån en redan genomförd bullerkartläggning. Vi kommer att hämta information om hemtjänst från Socialstyrelsens register för samtliga. Alla data kommer att vara avidentifierade så att ingen enskild person kan pekats ut.

För att kunna titta på eventuella förändringar över tid kommer vi att göra undersökningen för två olika tillfällen – 2015 och 2019. Vi kommer dels att titta på hur tillgång till gröna miljöer i omgivningen påverkar hemtjänstinsatser, och dels om det finns några effekter av omgivningen fem och tio år tidigare bland dem som flyttat under perioden. Dessutom planerar vi att identifiera de personer som under perioden 2010-2019 flyttat från eget boende till äldreboende (särskilt boende), och undersöka om de som bor i områden med mycket grönt och lite buller har mindre risk än sina jämnåriga att behöva flytta från sitt egna boende.

Skulle det visa sig att personer som bor i gröna miljöer med lite buller i mindre utsträckning behöver hjälp av hemtjänsten, och kanske också kan bo kvar hemma längre, kan detta vara ett incitament att öka mängden grönt i bostadsområden. Detta för att öka hälsan hos både de äldre och övriga som bor där. För den enskilde individen ligger den stora vinsten med sådana åtgärder i att vara frisk och ha möjlighet att ta hand om sig själv så länge som möjligt. På kommunal nivå är det även en ekonomisk fråga. Hemtjänstinsatser utgör en stor del av de svenska kommunernas budget, och kostnaden är högre för dem som bor på äldreboende än för dem som bor i sitt egna hem med hjälp av hemtjänst. Vidare kan en kommun som satsar på hälsofrämjande miljöer förväntas vara attraktiv för inflyttning, vilket i sin tur resulterar i ökade skatteintäkter. Från ett samhällsperspektiv finns det mycket att vinna på att få en friskare äldre grupp som kan delta i sociala aktiviteter och bidra till samhället även vid hög ålder.

Sammanfattning (svenska, max 1 500 tecken inklusive mellanslag)*

Sveriges befolkning blir allt äldre, och samtidigt med förstärkningar inom äldreomsorgen krävs insatser för att underlätta för äldre personer att förbli oberoende. Miljöer med stor andel gröna ytor och låga bullernivåer har visats påverka hälsa och välmående positivt, samt öka fysisk aktivitet och socialt umgänge. Sådana hälsofrämjande miljöer skulle därmed kunna minska åldrande individers behov av stöd för att klara sitt dagliga liv, ett stöd som regleras i Socialtjänstlagen och tillhandahålls via hemtjänst.

Vi kommer att etablera tre kohorter bestående av individer som bodde i Malmö eller Kristianstad och var minst 65 år 2010, 2015 respektive 2019. Dessa kohorter kommer att samköras med det nationella register som innehåller information om hemtjänstinsatser. Därefter kommer geografiska data avseende gröna miljöer att analyseras gällande andelen grönt i närområdet vid boendeadressen, samt avstånd till närmaste större grönområde. För individer boende i Malmö stad kommer även information om modellerat buller vid bostaden att läggas till.

Data kommer att användas för att undersöka eventuella effekter av hälsofrämjande miljöer på behov av hemtjänstinsatser, dels gällande aktuellt boende och dels gällande boende fem respektive tio år tidigare. Vidare kommer individer som flyttat till särskilt boende ("äldreboende") 2010-2019 att jämföras med övriga individer för att undersöka huruvida närmiljön spelar roll för hur länge man klarar av att bo i den egna bostaden.

Sammanfattning (engelska, max 1 500 tecken inklusive mellanslag)*

The Swedish population is aging, and parallel to reinforcements in elderly care, efforts are needed to facilitate for older people to cope in their daily lives. Neighborhoods with high percentages of urban green areas and low noise levels have been shown to have positive effects on health and wellbeing, and to increase physical and social activity. Such health promoting environments could thus reduce the need for support to manage the daily lives among older people.

We will establish three cohorts consisting of individuals who lived in Malmö or Kristianstad, and was 65 years, or older, in 2010, 2015, and 2019, respectively. These cohorts will be linked to the national register containing information about home care provided according to the Social Service Act. Information on urban green areas (amount and distance to closest) will be obtained through Geographical Information Systems (GIS). For individuals living in the City of Malmö we will also add information about the modeled noise at the place of residence.

Data will be used to investigate the possible effects of health-promoting environments on utilization of home care, using current neighborhood as well as the place of residence five and ten years earlier, respectively. Furthermore, individuals who moved to a nursing home 2010-2019 will be compared to the rest of the cohort in order to investigate whether the neighborhood environment affects the risk of moving to a nursing home.

Mål och syfte med projektet samt bakgrundsbeskrivning innehållande en översikt över forskningsområdet (max 7 000 tecken inklusive mellanslag)*

Traits of your surroundings may affect the way you act and interact, and may thus impact your health. E.g., having a recreational area close to your home may increase your willingness to engage in outdoor physical activity, which is beneficial for your health. Therefore, the term "health promoting environments" has been used to describe e.g., areas with large green elements, such as parks and gardens. However, are the effects of health promoting environments large enough to enable aging people to continue managing their daily lives without support from social services? The overall aim of this study is to assess a possible effect of health promoting environments, on social service utilization and moving to nursing home. Possible effects will be investigated both cross-sectionally and longitudinally. Moreover, stratified analyses will be used to identify groups for which health promoting environments may have particular benefit in terms of low utilization of social services and low risks of relocation. Knowledge about the effect of "health promoting environment" is important to enable individuals to plan for well-being in old age. It is also vital in urban planning, including densification of cities.

According to the World Health Organization (WHO) "health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" [1]. Activities and environment affects health on both individual and population level [2, 3], and one of the aims in the United Nations Sustainability Development Goals [4] is to "by 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities".

Green components in the outdoor environment that has been found to improve both general [5, 6] and mental health [7-9] in adult populations. Among older adults it has also been found to promote physical activity [10, 11], as well as facilitate social participation [12], two factors known to be important for maintaining health and wellbeing. Among older people, physical activity has been found to e.g. attenuate cognitive decline and disease [13], enhance mobility [14], improve physical function [14, 15], and prevent falls [16]. High levels of social activity and social participation have been linked to e.g. decreased risk of late-life disability [17], and increased cognitive performance [18]. Moreover, both physical and social activity has been found to be associated with lower health care utilization [19, 20]. In contrast, shortage of green space in the environment has been linked to lack of social support and feelings of loneliness [21, 22]. Thus, it is fair to assume that increasing the accessibility and quality of the neighbourhood may lead to increased health and wellbeing. As an example of this, a recent study [23] demonstrated an increased use and increased moderate-to-vigorous physical activity after renovations of neighborhood parks.

Today, there is a tendency towards densification of the build environment, with less urban green spaces left. This challenges the possibilities for taking advantage of the urban green spaces, particularly among those that are older, as increasing age is associated with difficulties with moving over long distances, due to lack of stamina, balance and strength. For people with mobility difficulties, the immediate surroundings are of outermost importance so that going outdoors is something easy and natural [24].

A further aspect of the outdoor environment is noise level. Among older people, traffic noise exposure has been found to be negatively associated with mental health [25, 26] and overall self-rated health [27], and positively associated with e.g. obesity [28] and hypertension [29]. Nighttime noise has been found to affect cognitive performance [30]. Apart from having its own direct effect on health, noise exposure has also been found to interact with other aspects of the environment, in that an abundance of greenery seem to reduce the negative experience of noise exposure [31]. Places within urban green areas where people perform most walking and relaxation activities are the ones with lowest noise levels [32]. In a review, urban parks has been shown to not only increase physical activity and create opportunities for recreation, psychological wellbeing, and social support, but also to, reduce stress and obesity, noise and cooling, as well as increase longevity [33].

The Swedish Social Service Act (Socialtjänstlagen) [34] regulates social services for e.g. older (65 years or older) people. The overall purpose is to aid older people in maintaining independency and an active life in their own home. Social services in ordinary housing (i.e. a residence that is not a nursing home) include assistance with instrumental and personal activities in daily living (IADL; PADL). For IADL, this may include help with household duties, errands to e.g. bank and post office, and delivery of ready-cooked meals (meals-on-wheels). Assistance in PADL involve not only e.g. eating, getting dressed, and personal hygiene, but also measures to prevent isolation and increase safety, such as an alarm or an assigned companion. Apart from these, individuals may also apply for day care services, temporary accommodation, and relief services for informal caregivers within the family. When these services are no longer enough for the individual to stay in their own home, they may apply to move to nursing home (sometimes referred to as residential care or institutional long term care).

During 1995 to 2015, the number of people in Sweden who are ≥ 65 years increased from 1.5 to 1.9 million, and the number of people 80+ years from 400k to 500k [35]. Immigration and an increasing longevity will cause these numbers to be even higher in decades to come [36]. This will put a strain on the services provided for older people by the municipalities. Already, several municipalities are unable to provide nursing home to all in need of such [37, 38]. Thus, the system providing social services needs to be reinforced to handle the ageing Swedish population. However, simultaneously, factors that may decrease the need of social services should be identified, thereby closing the widening gap between supply and demand regarding home care services and sheltered living among older people.

Thus, the evidence shows that urban green spaces have health benefits; on body functions as well as on activity and participation. In this project, the International Classification of Functioning, Disability and Health (ICF) [39], will be used as a framework to understand the relationships between the utilization of Social services, as a proxy of independence, and the environment. In the ICF, health is described as a dynamic process that integrates body function/structure, activity/independence and participation with personal and environmental factors.

Projektbeskrivning som innefattar upplagg, teori, metod, genomförande och en plan för vetenskaplig publicering (max 15 000 tecken inklusive mellanslag)*

This register study is set in Skåne, the southernmost part of Sweden. It is based on data from national registers and geographical (GIS, geographical information systems) data, combining cross-sectional and longitudinal analyses to investigate different aspects of the possible association between urban green areas and road traffic noise (exposure) and social service utilization and moving to nursing home (outcome).

The data collection and analysis procedure comprises the following steps, which are described in more detail below and in the figure (attachement).

1. Establishing study cohorts
2. Adding exposure data
3. Adding outcome data
4. Adding data on potential effect modifiers

Establishing study cohorts

Three cohorts will be established by identifying all older people (≥ 65 years) living in Malmö or Kristianstad municipality in 2010, 2015, and 2019, respectively, through the Swedish National Tax Register, by using the service "Navet" at the Swedish Tax Agency. Navet will also be used to obtain information on residential addresses for the year of the data collection (i.e. 2010, 2015, and 2019, respectively). Thus, for people included in more than one cohort, we will be able to establish change of residential address during the study period. Data from the Swedish National Tax Register will also allow us to identify people who moved out of the municipality or died during the study period.

Social services are granted based on individual needs assessment at a municipal level. As there are no national guidelines for this, the assessments may differ between municipalities. Thus, the restriction to only two municipalities (Malmö and Kristianstad) is done in order to minimize the impact of such potential differences. Malmö was chosen for inclusion as it is the largest municipality in the county of Skåne, but also because modelled traffic noise levels are available for all residents. Further advantages are that there is a large socioeconomic gradient within the municipality, and a relatively high percentage of people born outside Europe. Kristianstad was chosen as the municipality is demographically dispersed, with a densely populated city center as well as more sparsely populated areas in the countryside.

Based on data from 2015, we expect the total number of people in each Malmö-cohort to be about 50 000 and in each Kristianstad-cohort about 15 000 [40], with approximately 15% having been granted social services [41].

Adding exposure data

To obtain data on neighborhood characteristics, we will send the complete database to Statistics Sweden, who will add the coordinates for the place of residence. This information can then be implemented in a GIS (geographical information system), and thus processed and analyzed in regard to the exposure. Two neighborhood characteristics will be used as "exposure" – urban green qualities and noise levels.

Urban green spaces have previously been defined as "any land that is partly or completely covered with vegetation, such as parks, community, allotment or residential gardens, urban forests, or street trees" [42]. In this study, we will use land-use maps to identify urban green areas to include (parks, gardens, and recreational areas) as well as exclude (areas not necessarily accessible to the general public, such as football fields). With regards to those included, we will use five different measures.

- Closest distance to an urban green area.
- Within a 300 m[43] radius of place of residence:
 - Presence (yes or no) of urban green areas
 - Number of urban green areas
 - Quality (e.g. proximity to traffic, noise levels) of urban green areas
 - The percentage of urban green in the area

Road traffic noise will be assessed for Malmö. Noise levels will be modelled using the Nordic prediction method for road traffic noise [44] and the GIS software soundplan. The model takes into account road traffic, ground quality (hard or soft), and surrounding buildings. Thus, for each person, we will be able to obtain a measure of noise at the residential address.

Adding outcome data

Information on social services for the three years (i.e. 2010, 2015, and 2019) will be collected from the Social service register. During the period 2007-2012, all granted services were registered, but from 2013 and onward, only services actually provided are included. Home services recorded are described in Table 1. This information will be collected for the three years. In addition, data regarding place of residence (own home or nursing home) the last day of each month for all years during the period 2010-2019 will be collected. Thus, we will be able to link move to nursing home to the month it happened.

Table 1 Home services recorded in the Social service register, and aggregated variables for analyses in the study

Category	2007-2012	2013-	For analyses
Home services granted	Yes/no Number of hours	Yes/no Number of hours	<ul style="list-style-type: none"> At least one service Number of hours
Relief service for informal caregiver	Yes/no	Yes/no	<ul style="list-style-type: none"> Relief service for informal caregiver Support for informal caregiver¹
Relief service for informal caregiver, not included in home services		Yes/no	<ul style="list-style-type: none"> Relief service for informal caregiver Support for informal caregiver¹
Daily activities	Yes/no	Yes/no	<ul style="list-style-type: none"> Daily activities
Contact person/family	Yes/no	Yes/no	<ul style="list-style-type: none"> Contact person/family
Short term stay away from home	Yes/no	Yes/no Number of days	<ul style="list-style-type: none"> Short term stay away from home Support for informal caregiver¹
Companion service	Yes/no	Yes/no	<ul style="list-style-type: none"> Companion service
Meals-on-wheels	Yes/no		<ul style="list-style-type: none"> Meals-on-wheels
Meals-on-wheels, not included in home services		Yes/no	<ul style="list-style-type: none"> Meals-on-wheels
Personal care	Yes/no	Safety alarm only / safety alarm and other / no safety alarm	<ul style="list-style-type: none"> Personal care Safety alarm
Service	Yes/no	Meals-on-wheels only / meals-on-wheels and other / no meals-on-wheels	<ul style="list-style-type: none"> Service Meals-on-wheels
Safety alarm	Yes/no		<ul style="list-style-type: none"> Safety alarm
Safety alarm, not included in home services		Yes/no	<ul style="list-style-type: none"> Safety alarm

¹ Aggregated variable

Adding data on effect modifiers

Attempts to identify vulnerable groups, i.e. groups for which health promoting environments may be of particular benefit, will be done for three areas:

- Individual sociodemographic factors** will include ethnicity (using country of birth as a proxy), gender, age group, marriage status. These data will be collected from the Swedish National Tax Register.
- Neighborhood characteristics** will include type of housing (e.g. house or apartment) and access to services (e.g. public transportation and primary care center) as well as neighborhood socioeconomic status. It also includes differences in granting of social services between the different municipalities. Data will be obtained from Region Skåne's "Tillgänglighetsmodell" and "Potentialstudie" as well as data registers from Region Skåne and Lantmäteriet. Information on neighborhood socioeconomic status will be obtained from Statistics Sweden.
- Mobility devices** will include the number of people having been prescribed mobility devices, such as walking sticks, rollators, and manual/electric wheelchairs. Mobility device use indicates the functional

capacity of the person and, thus, the possibility for outdoor activities. Data will be obtained from the municipality registers (all devices except electric wheelchairs) and Region Skåne (electric wheelchairs).

Statistical analyses and considerations

An overview of the three areas in which analyses are to be performed is given in Table 2 and the variables to be used when assessing service utilization are described in Table 1. In analyses of service use, data on each type of service will be aggregated to a yearly level, both to dichotomous variables (i.e. having the service at least one month during the year) and to sum variables (i.e. the number of months with the service). Moreover, all services will be aggregated to sum variables (i.e. the number of different services provided during the year). Move to nursing home will be analyzed as time-to-event-data and will only include those not living in nursing home the first time they are included in one of the study cohorts.

Depending on which exposures and outcomes are analyzed, different statistical methods will be used. For example, for dichotomous outcomes (e.g. having IADL-support), generalized linear models will be used to estimate risk ratios, whereas analysis of variance (ANOVA) may be applicable to continuous outcomes. Time-to-event-data (move to nursing home) will be analyzed by means of survival analysis. All these methods have the advantage of allowing for adjustment for various confounders. Analyses taking into account repeated measures will be used when considering data with multiple time points (i.e. for people included in more than one cohort).

Table 2 Research areas to be investigated

Research area	Cohorts / outcome data	Exposure data	Study design	Data considerations
Current place of residence vs current utilization of services	2010, 2015, 2019	Same year as outcome data	Cross-sectional	Excluding people living in nursing homes
Previous place of residence vs current utilization of services	2015, 2019	Years previous to outcome data	Longitudinal	Excluding people living in nursing homes
Place of residence and move to nursing home	2015, 2019	Years previous to outcome data	Longitudinal	Data censored for people who died or moved out of the municipality

Each analysis will be performed for the whole cohort, as well as stratified by the potential effect modifiers defined above. Interaction with exposure (i.e. if exposure has different effects on outcome depending on which group you belong to) will be determined in separate models which include the cross-term between exposure and the factor investigated.

All statistical analyses will be performed in IBM Statistics by Anna Axmon, who is an experienced statistician. GIS analyses regarding access to health promoting environments and other geographical factors and exposures will be performed in ArcGIS 10.3 and Soundplan 8 by Emilie Stroh and Kristoffer Mattisson. Both with substantial experience in using GIS to assess environmental exposures in epidemiological studies.

Time plan

The study is planned for 2020-2022. As establishing the cohorts and adding information on exposures, outcomes and potential confounders is a multi-step procedure, which to a large part relies on parties outside the research group (e.g. Statistics Sweden and the National Board of Health and Welfare), we expect this part of the study to consume the better part of 2020. In 2021, the focus will be on the GIS-modelling. The analyses and reporting will take place in 2022. The manuscript writing will be initiated by a week-long work-shop for the entire research group during the spring of 2022. This method has been tried by parts of the research group in a previous project, and been found to be very time effective. A more detailed time plan is provided in Table 3.

Table 3 Work and time allocation

Year	Researcher(s) ¹	Responsibilities	Time allocated ²
2020	AA	<ul style="list-style-type: none"> • Project coordination • Apply for ethical approval • Apply for population data through Navet • Apply for data (except co-ordinates) 	15%
	ES & KM	<ul style="list-style-type: none"> • Obtain co-ordinates from Statistics Sweden 	10% each
2021	AA	<ul style="list-style-type: none"> • Project coordination 	5%
	ES & KM	<ul style="list-style-type: none"> • Modell GIS-data 	50% each
2022	AA	<ul style="list-style-type: none"> • Project coordination • Statistical analyses • Co-authoring all papers • Participating in academic and non-academic meetings 	25%
	ES, AMF, CL	<ul style="list-style-type: none"> • Main author on the papers within one area (c.f. Table 2) • Co-authoring all other papers • Participating in academic and non-academic meetings 	20% each
	KM, GC	<ul style="list-style-type: none"> • Co-authoring all papers • Participating in academic and non-academic meetings 	10% each

¹ See also next section, ² Based on full time work during the year

Research group

The research group will include six researchers from Lund University, all with different areas of expertise.

Anna Axmon (PI; associate professor at EPI@LUND at Division of Occupational and Environmental Medicine) is a statistician and epidemiologist with several years of experience of statistical analyses and register studies.

Gunilla Carlsson (associate professor at Centre for Ageing and Supportive Environments, CASE, Department of Health Sciences) is a registered occupational therapist with expertise in ageing and outdoor mobility.

Connie Lethin (PhD at Health-promoting Complex Interventions, Department of Health Sciences and Department of Clinical Sciences, Clinical Memory Research Unit) is a registered nurse with a substantial background in care for older people. CL has extensive research collaboration with municipalities and end-users in the County of Skåne.

Agneta Malmgren Fänge (associate professor at the Department of Health Sciences, with affiliation to the Centre for Ageing and Supportive Environments, CASE, Lund University) is a researcher in the Lund University Thematic Collaboration Initiative "Social Rights and Housing for an Ageing Population" and a registered occupational therapist with several years of experience of research among older people and people with disabilities in the municipalities. AMF has extensive research collaboration with municipalities and end-users, and has communicated her research in radio, podcasts and newspapers.

Kristoffer Mattisson (PhD at the Division of Occupational and Environmental Medicine) is an environmental hygienist and epidemiologist with expertise within GIS-data and exposure-response studies with focus on noise modelling.

Emilie Stroh (PhD at the Division of Occupational and Environmental Medicine) is an environmental epidemiologist with specific skills in using GIS (geographical information systems) for epidemiological studies, especially concerning population studies on environmental exposures and health outcomes.

Collaborations

The members of the research group have a network of scientist working in the same or similar fields as this study concerns. These include

Anders Wretstrand, associate professor at the Department of Traffic Planning and K2, Faculty of Technology and affiliated to Centre of Ageing and Supportive Environments.

Anne W Ekdahl, PhD and senior consultant in Geriatric Medicine and head of the Acute Geriatric Ward at Helsingborg Hospital. Scientific counsellor to the Swedish National board of Health and Welfare. General Secretary for the European Geriatric Medicine Societies.

Carlos Chiatti, PhD and health economist at the Department of Health Sciences, Lund University, and experienced in running evaluations of e.g. in relation to mobility patterns in older populations and accessibility to public transport options, utilizing GIS-data, as well as economic analyses.

Daniel Nilsson, Omvärldsanalytiker and GIS-expert at the unit *Samhällsanalys*, departement *Regional utveckling* at Region Skåne.

Beskrivning av projektets möjliga samhällsnytta och en plan för kommunikation med intressenter/slutanvändare (max 8 000 tecken inklusive mellanslag)*

Relevance

The Swedish population is aging, and parallel to reinforcements in elderly care, efforts are needed to facilitate for older people to cope in their daily lives. Neighborhoods with high percentages of urban green areas and low noise levels have been shown to have positive effects on health and wellbeing, and to increase physical and social activity. Such health promoting environments could thus reduce the need for support to manage the daily lives among older people.

Relevance to the society

That the group of people aged 65 years or more is increasing, both in absolute size and relative to the total population, will have a large impact on our society, with new opportunities and possibilities – provided that the increased longevity occurs parallel with increased number of healthy years [45]. Thus, identifying factors that enables older people to fully partake in the society is important. One such factor may be the outdoor environment. Knowledge about the effect of “health promoting environment” in this population is important for urban planning, including densification of cities.

Relevance to the individual

Independency, the ability to manage one’s own daily life (measured as e.g. functional independence, restricted ability to be alone, independence in activities of daily living, and participation), and aging in place are important contributors to the quality-of-life and subjective wellbeing of older people [46-49]. Also, even with decreased such ability, all people – regardless of age, and physical and cognitive prerequisite – have the right to be able to partake in society on equal terms, and have access to a safe environment in and around the home. Knowledge about the effect of “health promoting environment” is an important step in enabling people to plan for old age to remain their quality of life and well-being.

Relevance to the municipality

Social services comprise a large part of the municipalities’ budgets – in 2012 health care for older people made up 20% of their total expenses [50]. Hence, also from a financial point of view it would be appealing to increase independency among older people. If neighborhood characteristics can be shown to impact the need for social service, this may be considered in neighborhood planning such that more green areas are created and efforts are made to reduce noise levels. It could also be taken into account when constructing new nursing homes or senior housing (“55+ boende”), such that these are built in areas with more favorable surroundings. Knowledge about the effect of “health promoting environment” may thus be important to reduce the expenditures for social services in the municipalities.

Communication

The overarching aim of the communication in this project is to translate the knowledge generated, which will be strongly connected to health and human behavior, into urban planning practice. Knowledge translation is the synthesis, exchange, and application of knowledge to increasing innovation pace. Urban planning building are long-lasting processes, and decisions taken affect space distribution and use for many decades. Therefore, all communication efforts to increase the innovation pace are crucial.

The results from the project will have the potential to affect planning and building in urban areas, such as the proportion of green spaces vs spaces occupied by buildings. In order to inform future urban planning, we will need to attract the attention of and communicate our results to those in charge of decisions related to planning and use of spaces in the municipalities. This target group is trained and educated within technology and natural sciences, and less in issues related to health and human behavior. Therefore, the communication will focus on health and human behavior, and how this is affected by physical space. Ultimately, those responsible for planning and building will gain a deeper understanding of what it means to age in urban spaces and how urban planning can have a positive or negative effect on health and independency in older people.

Routes of communication

All communication with stakeholders outside the scientific community will be done in collaboration with the communications officers at the Medical Faculty and the Department of Laboratory Medicine (which is the affiliation of Anna Axmon, PI).

At the start of the project, we will publish two websites with study information – one for researchers and one for members of the public. This will be done in collaboration with LUPOP (Lund University Population Research Platform), and both websites will be on the domain lupop.lu.se. Both websites will contain information about the study, with information on how to opt-out from the study on the site aimed at members of the public. The websites will be continuously updated with study developments and results, and options will be provided to subscribe to these updates.

Two of the members of the research groups are associated with CASE, Center for Aging and Supportive Environment. We will thus have access to the CASE User Board during the study. The CASE User Board consists mainly of older people and representatives of various senior citizen's organizations, family members/carers and patient organizations. Representatives of other categories of knowledge users can also be included. Besides the Chair, the User Board consists of 5-6 persons in a core team. Diversity in gender, age, ethnicity, variations of functional capacity and geographical distribution in the south of Sweden are factors considered when board members are appointed. The core team can be extended by members with particular interest in a certain project or theme.

Communication with stakeholders

Considerable efforts will be made to spread the results from the proposed study in non-academic settings. Important arenas for this include those aimed at health care professionals, patients and relatives in geriatric care, and will include congresses and larger meetings (e.g. "Seniormässan", "Senior i centrum", and "Äldreomsorgsdagarna"), as well as magazines for the public and health care and social service professionals (e.g. "Vårdfokus", "Kommunalarbetaren", "Å", and "Äldreomsorg").

Other important stakeholders are the municipalities and the county. A report comparing Malmö and Kristianstad municipality will be freely available in the report series published by Occupational and Environmental Medicine SYD [51]. In separate appendices, the data for Malmö and Kristianstad municipality will be presented as absolute numbers as well as in relation to each other. The report with the relevant appendix will be sent to each municipality in the county as well as to the county administrative board (Region Skåne).

In order to reach a wider base of readers, we will also publish the results in the newsletter "Bulletin", also published by Occupational and Environmental Medicine in Lund [52]. Bulletin is published four times yearly and distributed to health care professionals and clinics all over Sweden (some 2500 subscribers), as well as being available online. We will also publish in "Vetenskap & Hälsa", popular science about medicine and health research in collaboration with Region Skåne, Lund and Malmö University, Lund University Magazine (LUM) and all research will be available on Lund University Research Portal (LUCRIS).

Scientific communication

The results from the study will result in at least three manuscripts which will be submitted for publication in open-access peer-reviewed scientific journals focusing on gerontology and geriatrics, such as Aging Research Reviews, Journal of Gerontology, Health and Place, Social Science and Medicine, and Health Science Journal. The topics of these manuscript will correspond to the three study parts described above. The results will also be presented at national and international conferences focusing on GIS-research, health care for older people, and epidemiology.

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