

Municipal policies and plans of action aiming to promote physical activity and healthy eating habits among school children in Stockholm, Sweden: a cross-sectional study

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Abstract

Background

Promoting physical activity and healthy eating habits by structural measures reaching most children in ~~a the~~-society is presumably the most sustainable way ~~of to~~ preventing development of overweight and obesity in childhood. The main purpose of the present study was to analyse ~~whether if~~ policies and plans of action at the central level in municipalities increased the number of activities-measures aiming to promote physical activity and healthy eating habits among school children aged 6 to 16. Another purpose was to analyse ~~whether if~~ demographic and socio-economic characteristics were associated with the level of such activities-measures.

Methods

Questionnaires were used to collect data from 25 municipalities and 18 town districts in Stockholm County, Sweden. The questions were developed to capture municipal structural work and factors facilitating ~~for children to be~~ physically active and the development of healthy eating habits for children. Local policy documents and plans of action were gathered. Information regarding municipal demographic and socio-economic characteristics was collected from public statistics.

Results

Policy documents and plans of action in municipalities and town districts did not seem to influence the level-number of activities-measures aiming to promote physical activity and healthy eating habits among school children in Stockholm County. Municipal demographic and socio-economic characteristics were, however, shown to influence the number of activity

measures levels. In town districts with a high total population size, and in municipalities and town districts with a high proportion of adults with more than 12 years of education, a higher level of health-promoting activities-measures was ere found. In municipalities with a high annual population growth the activity levels number of measures was ere lower than in municipalities with a lower annual population growth. Another key finding was the lack of agreement between what was reported in the questionnaires regarding existence and contents of local policies and plans of action and what was actually found when these documents were scrutinized.

Conclusions

Policy documents and plans of action aiming to promote physical activity and healthy eating habits among school children aged 6 to 16 in municipalities and town districts in Stockholm County did not seem to have an impact on the local level of activity measures. Demographic and socio-economic characteristics of the municipalities and town districts were on the other hand associated with local health-promoting activities measures.

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Key words: physical activity, eating habits, school children, policy, municipalities

Background

Overweight and obesity are important health problems among children and adolescents in the Western countries [1][1][2, 3]. A study conducted in Stockholm County, Sweden, in 2003 showed that ~~among boys~~ 20.5% of all boys were overweight, and 3.8% were obese. ~~For~~Among girls the corresponding prevalence estimates were 19.2% and 2.8% [4][2]. Area Place of residence has been shown to be significantly associated with BMI in late adolescence and adulthood [5, 6][3, 4]. Strong socio-economic gradients with higher prevalence of overweight and obesity among children and adolescents from disadvantaged groups have been reported ~~among children and adolescents~~ in e.g. Sweden and Canada [7, 8][2, 5, 6, 7]. There are several mechanisms of the obesity epidemic ~~are several~~ but physical activity and eating habits are strongly related to weight development at a population level. A recent study from Stockholm showed that 71% of 15-year-olds were physically active ~~at~~ a moderate or high level for 60 minutes per day or more [9][7]. It was also shown, however, that adolescents with a lower educated mother, those in ~~overcrowded~~deramped accommodation, and those with immigrant background ~~were devoted~~ the most ~~time to~~ sedentary activities. It was recently reported that only about one third of those aged 15 years and older in the European Union are physically active at the recommended levels [10][8], indicating that in many European countries adolescents may be less active than in Sweden. This also applies to children ~~11 to 15 years of age~~between the ages of 11 and 15 [11][9].

Adults can more or less make their own lifestyle choices ~~of life style~~, but children are left with parental decisions and, socio-cultural family environment as well as structural factors related to schools, the local community and ~~the~~ society as a whole [10]. Interventions at the family level will depend on the families' ability to ~~follow~~adapt to ~~advices~~ and make behavioural changes and results are therefore likely to be related to social class and parental

educational level. Interventions at school and/or municipal level, however, provide good opportunities to set up structures that support physical activity and healthy eating habits reaching all children, regardless of socio-economic family position. Such structures can be either obesogenic, meaning that they prevent or hinder ~~un~~healthy behaviours, or leptogenic, meaning that they encourage healthy behaviours [12, 13][10, 11]. A theoretical framework based on obesogenic and leptogenic environments is has been developed by Swinburn and colleagues. This framework is divided into the political environment, the physical environment, the economic environment and the socio-cultural environment [12][10].

Examples related to physical activities are adjustments of infrastructure ~~such as like~~ -traffic-calming measures aiming to increase pedestrian and bicycle safety [14, 15][12, 13]. In a systematic review van Sluijs, McMinn and Griffin stated that interventions including both school and family or community involvement have a better potential to increase levels of physical activity among adolescents than interventions focusing only on one of these levels. [16][14]. Research has also shown that access to facilities such as parks and activity programmes and time spent outdoors are positively related with levels of physical activity among children [17][15]. The Guidelines for School Lunches, developed in Sweden by the Swedish National Food Administration, is an eExamples of structural factors promoting healthy eating habits ~~are Guidelines for School Lunches, in Sweden developed by the Swedish National Food Administration.~~ Other examples of health-promoting factors are absence of soda machines and candy stores in and around schools and food policies in schools [18, 19][16, 17].

The ~~above described~~ factors described above are examples of environments supporting physical activity and healthy eating habits. Starting with the Ottawa conference in 1986 a new broader understanding of health promotion was adopted [20][18]. It was subsequently

realized that changes at the societal level often is a more feasible and efficient way of ~~facilitating to improve~~ life-style ~~changes at~~ a population level than interventions aimed at behavioural change ~~at~~ the individual level [21][19], and policy-making became an issue on the public health arena. The policy process is often described in several stages, e.g. problem identification, policy formulation, policy implementation and policy evaluation [22][20, 21]. According to this, structured public health work normally comprises policies, plans of action, implementation measures and evaluations. Such structured work has been shown to be successful e.g. in safety promotion [23][22].

In Sweden the municipalities are accountable for the main part of the arenas where children and adolescents spend considerable amounts of their time, e.g. preschools ~~and~~, schools ~~as well as~~ local infrastructure ~~such as~~ like the ~~route~~ way to school, playgrounds and leisure environments. ~~The Swedish compulsory school comprises children aged 6 to 16.~~ Swedish municipalities have, like municipalities in many other welfare states [24][23], unique conditions regarding self-government, democratic control and tax equalisation, which takes into account e.g. age distribution, tax-paying capacity and population density. ~~This autonomy implies that while the national government legislate on e.g. the building, traffic and school environments, it cannot prescribe exactly how the local governments shall put these laws into practice and the. Public authorities, such as~~ like the Swedish National Institute of Public Health, have developed public health objectives ~~which also, also~~ addressing healthy eating and physical activity. ~~, but~~ These objectives are ~~however not imperative, however are,~~ but guiding principles for the municipalities ~~cannot rule the municipalities. However, there exist however eleven public health objectives aimed to function as guiding principles.~~ In large big municipalities the local government is often decentralised to town districts. Thus,

municipalities and town districts seem to be [the](#) proper arenas for structural health-promoting actions aiming to reach a large proportion of the children and adolescents.

In the light of these circumstances the aims of our study were threefold: (i) firstly, we wanted to investigate [whether](#) policies and plans of action at a central municipal level increased the number of [activities-measures](#) carried out to promote physical activity and healthy eating habits among school children [aged 6 to 16](#); (ii) secondly we intended to investigate to [what](#) extent such [activities-measures](#) were given priority in municipalities and town districts, i.e. [whether](#) physical activity and healthy eating habits among school children were judged to be important by local decision-makers; (iii) thirdly, we wished to explore [whether](#) municipal demographic and socio-economic characteristics were associated with the amount of local [activities-measures](#) carried out to promote physical activity and healthy eating habits among school children.

Methods

In this cross-sectional study questionnaires and public statistics were used to collect data from all municipalities (9 000 to 91 000 inhabitants) in Stockholm County. In addition, the town districts of the municipality of Stockholm, the largest municipality in Sweden (794 500 inhabitants), were included.

Indicators were developed and survey questions constructed in order to capture the work carried out by the municipalities at a structural level to [enable/facilitate for](#) children and adolescents to be physically active and to develop healthy eating habits. [This was done by searching the literature and by consulting health planning officers and other experts in the municipalities.](#) -We used the theoretical framework for obesogenic environments developed

by Swinburn and colleagues which is divided into the political environment (e.g. policies, plans of action and systematic follow-up at the central level), the physical environment (e.g. ability to walk and bike and public accessibility to sports facilities), the economic environment (e.g. free or subsidised entrance to sports facilities, subsidies to sports clubs and free school lunches) and the socio-cultural environment (e.g. attitudes to health promotion among decision-makers, public officials and school headmasters) [12][10]. Attitudes to health promotion among municipal decision-makers were supposed to be revealed throughby questions regarding how health-promoting measures were prioritised in the municipality. The Swinburn's conceptual framework was used to construct and categorize the blocks of questions used in the questionnaires (Table 1). The first part of the questionnaire aimeding to identify and characterize structured public health work (the political environment) andthe first part of the questionnaire was built on three often-mentioned stages in the policy process [22][20]: policy formulation (*Are there any policies aiming to promote physical activity and/or healthy eating habits?* and *Are there any plans of action aiming to promote physical activity and/or healthy eating habits?*), policy implementation (*Are any measures of implementation taken to promote physical activity and/or healthy eating habits?*) and finally policy evaluation (*Are systematic follow-ups of implemented measures performed?*). The concepts policy, plan of action and evaluation wereas defined in the questionnaire. In order to distinguish activities-measures related to the physical, economic and socio-cultural environments, questions based on previous research were used (Table 1).

Table 1 in about here.

The questionnaires were sent by mailmailed to all municipalities (N=25) in the Stockholm County in late 2005 and early 2006. Due to the large population size of the Stockholm

municipality the local political and administrative responsibilities have been delegated to town districts. Accordingly the questionnaires were also [sentmailed](#) to all town districts in [the Stockholm municipality \(N=18\)](#). [Two written reminders and one final reminder by telephone were given](#) [accomplished](#). The response to each question was coded with the intention to reflect [the level of activity](#) [level of measures](#). Question group scores were computed within each block of questions (the political, physical, economic and socio-cultural environment). These question group scores [were designed](#) [were presumed](#) to mirror the [level of activity](#) [measures taken](#) within each block of questions. The [activities-measures](#) were not weighed regarding quality of evidence or reach into the municipalities. Thus, all [activities-measures](#) were given equal weight. Only fully appropriate responses to the questions were scored as if the municipality or town district provided significant activity, as explained in Table 2.

Table 2 in about here.

As a validity measure policy documents and plans of action were gathered from the municipalities and town districts and compared to the answers given in the questionnaires. The survey questions *“Are there any policies aiming to promote physical activity and/or healthy eating among school children?”* and *“Are there any plans of action aiming to promote physical activity and/or healthy eating among school children?”* were compared to the collected policy documents and plans of action and coded in the following manner: five criteria had to be fulfilled to get these questions validated and coded as “Yes, there exists a policy/plan of action”, namely 1) the response in the questionnaire should be “Yes”, 2) the policy/plan of action should be attached, 3) the attached policy should be politically adopted, 4) the attached policy should be of contemporaneous relevance, and 5) the attached policy should contain clear and measurable aims regarding physical activity and/or healthy eating

habits among children and adolescents. Answers to question 2 and 3 were mostly found, except from in the attached policy documents and in the plans of action, but also on the websites of the municipalities. Questions 3 to 5 in the validity control also constituted a means of checking the quality of the policy documents and plans of action. If e.g. a policy document was not approved in the municipal executive board or if there were no clear and measurable aims, the quality of the policy document was assessed to be low. Two researchers (first and second author) were independently involved in the quality check of all the policy documents and plans of action.

Information regarding municipal demographic and socio-economic characteristics (total population size, annual population growth and proportion of adults with more than 12 years of education) were gathered from public statistics [25, 26][24, 25].

Statistical analysis ~~comprise consists of cross tables and correlations calculated by using Spearman rank correlations estimated by the in-SAS software package [27] in SAS software package.~~ Associations between different question groups as well as between question groups and demographic and socio-economic characteristics were assessed. Data from municipalities and town districts were analysed both separately and kept together.

Results

Twenty-three out of 25 municipalities and 17 town districts out of 18 completed answered the questionnaire. Twelve municipalities and five town districts attached policy documents and five municipalities and six town districts attached plans of action. Of the attached documents, only seven policy documents and three plans of action from the municipalities and five policy

documents and one plan of action from the town districts were approved. Not a single municipality and only one town district could present the whole chain of structured public health work such as valid policy documents, valid plans of action ~~forte~~ implementation and evaluation measures.

The structural variables comprise municipal measures ~~enablingfacilitating for~~ children and adolescents to be physically active and to develop healthy eating habits. The variables were divided ~~into~~ four question groups as described above, i.e. political environment, physical environment, economic environment and socio-cultural environment. No significant associations were found between the four question groups (Table 3). The political environment thus does not seem to be associated with ~~activities-measures~~ that are implemented in municipalities and town districts in order to promote physical activity and healthy eating habits among school children. A correlation of borderline statistical significance ($r_s=0.31$, $p=0.055$) appeared between socio-cultural environment and physical environment. This could imply that in municipalities and town districts where public officials and politicians have a positive attitude to ~~health promotion of physical activity and healthy eating habits the~~ more ~~or and~~ better measures are taken to enhance the physical environment (e.g. maintenance of bike paths ~~during winter time with snow~~). Although Swedish municipalities often invest in various health-promoting measures, especially aimed at children and adolescents, the ~~activities-measures~~ asked for in this study ~~does~~ not seem to be given ~~highstrong~~ priority by local decision-makers.

Demographic and socio-economic characteristics at the municipal level (total population size, annual population growth, and proportion ~~of~~ adults with more than 12 years of education) were analysed in relation to the structural variables (Table 4). The results for municipalities

and town districts are presented both separately and jointly. Town districts with a higher total population size offered more activities-measures aiming to promote physical activity and healthy eating habits among school children ($r_s=0.53$, $p=0.030$) than municipalities and town districts with lower total population size. Investments related to the physical environment were higher in those town districts wherein-which a higher proportion of the adult population had attained more than 12 years of education ($r_s=0.74$, $p=0.006$). For the municipalities an inverse association ($r_s=-0.41$, $p=0.054$) was seen between annual population growth and the number-amount of activities-measures taken with the aim aiming to promote physical activity and healthy eating habits among school children.

Tables 3 and 4 in about here.

A finding not be overlooked was the lack of agreement between what was reported in the questionnaires as local policies and plans of action and the relatively pointless documents actually observed by the investigators when scrutinizing and comparing the responses with the attached documents. Out of af the in total of 28 attached policy documents and plans of action, only 16 were of a a-quality-high enough quality to be approved.

Discussion

The main findingresult of this study was that policy documents and plans of action aiming to promote physical activity and healthy eating habits among school children in municipalities and town districts did not seem to be associated with ongoing health-promoting activitiesmeasures. By contrast, our results indicate that demographic and socio-economic characteristics at the municipal level were associated with the amount and level of activitymeasures. In town districts with a high total population size more health-promoting

actions were reported. This was also the case in municipalities and town districts with a high proportion of adults with more than 12 years of education. In municipalities with a high annual population growth, less action to promote healthy eating and physical activity patterns ~~wasere~~ seen than in municipalities with a lower annual population growth.

The structured public health work in the municipalities and town districts in the Stockholm County seemed to be afflicted by serious limitations regarding actions aiming to ~~enablefacilitate for~~ school children to be physically active and develop healthy eating habits. Policies of sufficient quality were rare and plans of action even more uncommon.

Implementation measures and evaluations of the complete chain of structured public health work; from policy, plan of action to implementation, ~~did~~ hardly existed anywhere.

Furthermore, ~~structured public health work did not seem to be what it was told to be by the municipalities and town districts. W~~hen the answers in the questionnaires were compared to attached documents it became obvious that what municipalities and town districts labelled policies and plans of action aiming to promote physical activity and healthy eating habits could in fact ~~could~~ not be considered as such. A variety of shortcomings appeared, e.g. the policies and plans of action were not politically adopted, not currently valid or did not contain clear and measurable aims. Some of these documents might therefore be difficult to implement and perhaps even more difficult to evaluate. There are several reasons for the discrepancy between what was reported in the questionnaires and what was stated in the gathered documents. The municipalities and town districts may have wished to exaggerate their public health work when responding to the questionnaire or they may not have been fully aware of the weaknesses of their policies and plans of action. Since no municipality and only two town districts have evaluated their policies and plans of action it must have been difficult to realisize their limitations and potential lack of impact. The overall lack of evaluation is

noteworthy. Another possible reason for the discrepancy between what was reported in the questionnaires and what was stated in the gathered documents is that their “wrong” people may have responded to the questionnaires. No specific persons in the municipalities were addressed. Instead it was explained in the cover letter which topics the questionnaire concerned and suggested which professions that might be the appropriate respondents.

It is somewhat surprising that there were no clear-cut associations between structured health-promoting work according to answers related to the political environment and answers related to the physical, economic and socio-cultural environments in the municipalities and town districts. Could this lack of associations be a consequence of limitations of the questionnaire intended to measure policies, plans of action and evaluation? The authors do not believe so, as because a thorough validity check was performed by comparing questionnaire responses with policy documents and plans of action gathered and only responses that could be validated against attached documents were approved. Instead it is possible that structural activities-measures aiming to positively influence physical activity and eating habits among school children were given rather low priority in the municipalities and town districts. The goals in the policy documents were mostly rather all-embracing and not easy to turn into specific objectives which could might be evaluated later on. Means of to reaching the goals in the policies were seldom clearly specified in the plans of action. Therefore, it may be considered whether the rather low quality of the policies and plans of action might hamper local actions and activities-measures. A final interpretation of the lack of association between structured health-promoting work related to the political environment and activities-measures related to the physical, economic and socio-cultural environments is the well-known difficulties of to implementing new methods in everyday practice in general [28, 29][26-29].

The strikingly negative response (see Table 2) to the question “*Are there any implementation measures taken to promote physical activity and/or healthy eating habits?*” makes this interpretation plausible.

Structured public health work, comprising policies, plans of action, implementation measures and evaluations has convincingly been shown to be successful in safety promotion [23][22]. So then, how does activities-measures aiming to promote physical activity and healthy eating habits among Swedish school children differ from activities-measures on the international arena of safety promotion? Within the safety promotion area the importance of the whole chain (policies, plans of action, implementation measures and evaluation) of structured public health work has been emphasized, e.g. by systematic injury registration. In the present study only the first part of the process (policies and plans of action) is discernable, and, in fact, withshows-a very low quality. Thus, the important components of implementation measures and evaluation are missing. The linear approach to the policy process is discussed among policy researchers [22, 30]. It is argued that the policy process is more complex and not linear. The linear approach is helpful in gathering and structuring data, although we must be careful with implications based on a presumed linear policy process.

Regarding the influence of municipal demographic and socio-economic characteristics, similar results have been reported from previous studies. Guldbrandsson and Bremberg showed that growing municipalities reported fewer safety-promoting activities-measures [31][30] and fewer activities-measures aiming to promote mental health among preschool children [32][31] than municipalities with a stable population size. On the other hand, in these studies the proportion of the adult population with more than 12 years of education was not associated with the amount of health-promoting actions, i.e. the intentions to promote young

people's health appeared to be similar in municipalities with higher and lower percentage of well-educated people. This ~~goes against the results of~~ ~~is opposite to~~ the present study which showing a clear-cut positive association between the proportion of well-educated adults and activities-measures aiming to improve the physical environment in both municipalities and town districts. Positive associations probably depend on higher tax-paying capacity and higher demands for municipal services among well-educated people. The discrepancy between the previous studies and the present study might be explained by changes in the Swedish national system for equalising municipal resources which came into force on ~~made~~ 1st January 2005.

Conclusions

Policy documents and plans of action aiming to promote physical activity and healthy eating habits among school children in municipalities and town districts in Stockholm, Sweden did not seem to be associated with ongoing health-promoting activities-measures at the local level. Demographic and socio-economic characteristics, however, seemed to be associated with such activitiesmeasures. There was no agreement between what was reported in the questionnaires concerning the existence of local policies and plans of action and what was observed by the investigators when scrutinising requested documents attached to the questionnaires. Researchers and policy-makers should thus be aware of potential discrepancies between what is declared in policiesy and plans, often worded in relatively pointless documents-general terms, and what is actually done in terms of health promoting activities-measures regarding school health promoting activities-measures at the local municipal level. High-quality local policies and plans of action have to be developed, implemented and evaluated to assess whetherif the low impact revealed in the present study is

the consequence of poor-quality documents. Local implementation and evaluation efforts must be strengthened.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

All authors contributed significantly to the development of the research questions, plan for analyses, interpretation of results, and to [the](#) drafting [of](#) the paper. KMW was mainly responsible for [developing the questionnaire](#), data collection and statistical analyses. FR developed the research proposal and was [the](#) holder of a grant from the Public Health Committee, Stockholm County Council. All authors [contributed significantly to the final version](#)~~have given final approval of the version to be published.~~

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Table 1. Environmental perspectives (Swinburn et al 1999) related to survey questions supported by previous research.

Environmental perspectives	Survey questions	References
Political environment	Are there any <i>policies</i> aiming to promote physical activity and/or healthy eating?	[33, 34] [32, 33, 35] [35] [34, 35]
	Are there any <i>plans of action</i> aiming to promote physical activity and/or healthy eating?	
	Are there any <i>implementation</i> measures made to promote physical activity and/or healthy eating?	
	Are <i>systematic follow-ups</i> of implemented measures performed?	
	Are objectives, plans and evaluations regarding physical activity stated in the municipal school plan?	
	Are objectives, plans and evaluations regarding healthy eating stated in the municipal school plan?	
Economic environment	Are there any incentives provided in order to increase the use of <u>sports</u> centres among children?	[36, 37] [35, 36]
Socio-cultural environment <i>(Attitudes to health promotion among municipal decision-makers were supposed to be revealed by questions regarding how health-promoting measures were prioritised in the municipality)</i>	Are there any measures taken in order to increase walking and biking to school and in general?	[38, 39] [37, 38]
	Have any overhauls of walking and bike paths been performed <u>induring</u> the <u>lastprevious</u> 5 years?	
	Have any overhauls of walking and bike paths to and from schools been performed <u>during</u> the <u>lastprevious</u> 5 years?	
	Have any overhauls of the traffic safety in the immediate vicinity of the schools been performed <u>during-in</u> the <u>previous-last</u> 5 years?	
	Compared to the municipal road network, how prioritized are the bike paths regarding maintenance during winter time?	
	Is there any public health officer or similar staff employed in the municipality?	
	Is there any diet head or diet coordinator employed in the municipality?	
Physical environment	Are up-to-date and weather- <u>proof</u> bike stands provided?	[39-47] [38-46]
	Are bike paths maintained during winter time?	
	Has a general speed limit of 30 km/h been <u>implementedincorporated</u> in housing areas?	
	Part of total bike paths separated from road traffic	
	Kilometers <u>of</u> biking paths in relation to municipal road network.	
	Kilometers <u>of</u> walking paths in relation to municipal road network.	

Table 2. Activities Measures taken with the aiming to facilitate physical activity and healthy eating habits among school children in 23 municipalities and 17 town districts in Stockholm County.

Environmental perspectives	Survey questions	Number of municipalities with significant activity measures taken	Number of town districts with significant measures taken
Political environment	Are there any policies aiming to promote physical activity and/or healthy eating? <i>Significant <u>measures taken</u>=Yes, AND the policy should be attached AND be politically adopted AND be of present interest AND contain clear and measurable aims.</i>	6	1
	Are there any plans of action aiming to promote physical activity and/or healthy eating? <i>Significant <u>measures taken</u>Significant activity =Yes, AND the plan of action should be attached AND be politically adopted AND be of present interest AND contain clear guiding principles on how to reach the aims in the policy.</i>	3	2
	Are there any implementation measures made to promote physical activity and/or healthy eating? <i>Significant <u>measures taken</u>Significant activity =Yes, and there is a responsible person</i>	1	2
	Are systematic follow-ups of implemented measures performed? <i>Significant <u>measures taken</u>Significant activity =Yes, and there is a responsible person</i>	0	2
	Are objectives, plans and evaluations regarding physical activity stated in the municipal school plan? <i>Significant <u>measures taken</u>Significant activity =Yes, AND the school plan should be attached AND contain measurable aims AND follow-up intentions AND a responsible person</i>	8	2
	Are objectives, plans and evaluations regarding healthy eating stated in the municipal school plan? <i>Significant <u>measures taken</u>Significant activity =Yes, AND the school plan should be attached AND contain measurable aims AND follow-up intentions AND a responsible person</i>	8	2
	Economic environment	Are there any incentives provided in order to increase the use of sports centres among children? <i>Significant <u>measures taken</u>Significant activity =Yes, AND a sufficient example</i>	5

Socio-cultural environment	Are there any measures taken in order to increase walking and biking to school and in general? <i>Significant measures taken</i> Significant activity = Yes, measures are taken to increase both walking and biking to school	14	11
	Have any overhauls of walking and bike paths been performed during in the previous last 5 years? <i>Significant measures taken</i> Significant activity = Yes, all walking and bike paths	9	4
	Have any overhauls of walking and bike paths to and from schools been performed during in the previous last 5 years? <i>Significant measures taken</i> Significant activity = Yes, all walking and bike paths to and from schools	4	1
	Have any overhauls of the traffic safety in the immediate vicinity of the schools been performed during in the previous last 5 years? <i>Significant measures taken</i> Significant activity = Yes, a TOTAL overhaul	5	2
	Compared to the municipal road network, how prioritized are the bike paths regarding maintenance during winter time? <i>Significant measures taken</i> Significant activity = more important than the road network	6	8
	Is there any public health officer or similar staff employed in the municipality? <i>Significant measures taken</i> Significant activity = Yes	11	0
	Is there any diet head or diet coordinator responsible for nutritional quality of meals served in institutions in the municipality? <i>Significant measures taken</i> Significant activity = Yes	18	7
Physical environment	Are up-to-date and weather proof bike stands provided? <i>Significant measures taken</i> Significant activity = Yes, there are up-to-date bike stands at all schools AND most bike stands are weather proof	5	5
	Are bike paths maintained during winter time? <i>Significant measures taken</i> Significant activity = Yes, the whole bike path network	13	10
	Has a general speed limit of 30 km/h been incorporated implemented in housing areas? <i>Significant measures taken</i> Significant activity = Yes, in all housing areas	3	11
	Part of total bike paths separated from road traffic <i>Significant measures taken</i> Significant activity = >90%	11	
	Km of biking paths in relation to municipal road network. <i>Significant measures taken</i> Significant activity =>median (0,52)	5	

	<p>Km <u>of</u> walking paths in relation to municipal road network.</p> <p><i>Significant measures taken</i><i>Significant activity</i> => <i>median (0,41)</i></p>	7	
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Table 3. Spearman rank correlations between questions groups related to structures in society aiming to facilitate physical activity and healthy eating habits among school children in 23 municipalities and 17 town districts in Stockholm County.

	Political environment	Physical environment	Economic environment
<i>Municipalities and town districts</i>			
Physical environment	-0.003 (0.985)		
Economic environment	-0.16 (0.319)	-0.18 (0.254)	
Socio-cultural environment	0.12 (0.444)	0.31 (0.055)	0.10 (0.529)
<i>Municipalities only</i>			
Physical environment	0.03 (0.882)		
Economic environment	-0.25 (0.241)	-0.32 (0.132)	
Socio-cultural environment	-0.05 (0.829)	0.25 (0.249)	0.35 (0.101)
<i>Town districts only</i>			
Physical environment	-0.18 (0.486)		
Economic environment	0.00	0.03 (0.917)	
Socio-cultural environment	0.07 (0.794)	0.40 (0.107)	-0.17 (0.500)

p<0.05 significant

p<0.10 tendency

Table 4. Spearman rank correlations (Spearman Rank, r_s) between questions groups related to structures aiming to facilitate physical activity and healthy eating habits and selected socio-economic and demographic characteristics of 23 municipalities and 17 town districts in Stockholm County.

Questions groups related to structures aiming to facilitate physical activity and healthy eating habits	Total population size	Annual population growth	Adults with >12 years of education
<i>Municipalities and town districts</i>			
Political environment	0,25 (0,111)	-0,18 (0,275)	0,20 (0,219)
Physical environment	0,26 (0,106)	-0,16 (0,321)	0,36 (0,022)
Economic environment	-0,03 (0,854)	-0,01 (0,927)	-0,09 (0,580)
Socio-cultural environment	0,27 (0,097)	0,007 (0,965)	-0,12 (0,474)
Total score	0,36 (0,022)	-0,09 (0,580)	0,05 (0,753)
<i>Municipalities only</i>			
Political environment	0,18 (0,408)	-0,28 (0,201)	-0,18 (0,407)
Physical environment	0,15 (0,486)	-0,39 (0,068)	0,20 (0,350)
Economic environment	0,09 (0,665)	0,34 (0,110)	-0,08 (0,718)
Socio-cultural environment	0,22 (0,308)	-0,27 (0,211)	-0,33 (0,120)
Total score	0,25 (0,255)	-0,41 (0,054)	-0,13 (0,543)
<i>Town districts only</i>			
Political environment	0,44 (0,076)	-0,09 (0,736)	0,00
Physical environment	0,46 (0,062)	0,12 (0,637)	0,74 (0,006)
Economic environment	-0,21 (0,417)	-0,32 (0,206)	-0,24 (0,359)
Socio-cultural environment	0,35 (0,170)	0,20 (0,430)	0,30 (0,237)
Total score	0,53 (0,030)	0,23 (0,381)	0,56 (0,018)

$p < 0.05$ significant

$p < 0.10$ tendency