Children´s Active Commuting to School:
Changes in Transportation Habits from 2008 to 2018?

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This master's thesis is carried out as part of the education at the University of Agder and is therefore approved as a part of this education. However, this does not imply that the University answers for the methods that are used or the conclusions that are drawn.

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SAMMENDRAG

Bakgrunn: Flere Stortingsmeldinger trekker frem at norske skoleveier må legge til rette for å kunne fremme sykling og gange som et transportmiddel til skolen. Aktiv transport til skolen kan være viktig bidrag for at barn skal nå Helsedirektoratet sine anbefalinger om å delta i fysisk aktivitet med moderat eller høy intensitet i minimum 60 minutter hver dag.

Hensikt: Formålet med oppgaven er å undersøke om det har skjedd en forandring innen transportsvaner blant elever som går i 6.- og 7. klasse på barneskolen fra 2008 til 2018. Det ses også etter interaksjoner mellom transportmetodene og tid i forhold til kjønn, foreldres utdanning, avstand til skolen og etnisitet

Metode: Studien er basert på to tverrsnittstudier i Hedmark og Telemark fylke fra henholdsvis 2008 og 2018. Variablene kjønn, foreldres utdanning, distanse til skolen og etnisitet ble rapportert med et spørreskjema. Transportsvanene ble målt i spørreskjema gjennom en transport matrise. Barna ble inndelt i kategorier som ganger, syklist, bilist eller offentlig transport. Dataene ble analysert med logistisk regresjon.

Resultat: Resultatene viser at færre elever rapporterer bruk av offentlig transport til skolen i 2018 sammenliknet med 2008. Studien viser ingen forskjell i andelen elever som går, sykler eller kjører til skolen i 2008 og 2018.

Konklusjon: Det har vært lite utvikling innen aktive transportsvaner blant barn på barneskolen fra 2008 til 2018. Det har vært en nedgang i bruk av offentlig transport blant barn i 6.- og 7.klasse fra 2008 til 2018.

Nøkkelord
Aktiv transport, barn, barneskole, skolevei, endring, Norge

SUMMARY

Background: White papers points out that Norwegian school roads need to promote cycling and walking as a transportation mean to school. Active commute to school can be an important contribution for children to reach the daily physical activity recommendations.

Objectives: The purpose of the paper is to investigate whether there has been a change in commuting habits among pupils attending 6th and 7th grade in primary school from 2008 to 2018. We will be looking for interactions between transportation methods and time, as well as interaction between time and sex, parental education, distance to school and ethnicity.

Design: The study is based on two cross-sectional studies in Hedmark and Telemark county from 2008 and 2018, respectively. The variables gender, parental education, distance to school and ethnicity were reported with a questionnaire. Transportation habits were measured in the questionnaire through a matrix. The children were divided into categories (walkers, cyclist, transport by car or public transportation). The data was analyzed with logistic regression.

Results: The results show that fewer pupils reported the use of public transportation to school in 2018 compared to 2008. There was no difference in the proportion of pupils walking, cycling or driving to school in 2008 and 2018.

Conclusion: There has been little development in active commuting among children in primary school from 2008 to 2018. There has been a decrease in the use of public transport among children in the 6th and 7th grade from 2008 to 2018.

Keywords
Active commute, active transportation, pupils, children, primary school, time trends, Norway

ACKNOWLEDGMENT

This master this represent the end of five years of studying public health at the University of Agder. The last year has been exciting and educational, but also a demanding and challenging time. It has been quite a process and I am proud to submit this master`s thesis.

The research paper presented in this master`s thesis will be submitted to BMC Public Health.

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TABLE OF CONTENT

LIST OF ABBREVIATIONS

AC - Active commuting

FVMM - Fruits and Vegetables Make the Marks

MVPA – Moderate-to-vigorous physical activity

PA – Physical activity

SCT - Social cognitive theory

SES - Socioeconomic status

WHO - World Health Organization

1.0 INTRODUCTION

It is essential to promote physical activity (PA) in early childhood and youth to improve their current and future health (Jones, Hinkley, Okely, & Salmon, 2013; Telama, 2009). PA is important for the promotion of health-related quality of life (Nordic Co-operation, 2014; The Norwegian Directorate of Health, 2003). Children are recommended by World Health Organization, Nordic Co-operation and the Ministry of Health and Care Services of Norway to be a minimum of 60 minutes of PA during the day (Ministry of Health and Care Services, 2013; Nordic Co-operation, 2014; World Health Organization, 2018). Recommended daily PA levels can also be reached by breaking down this period into shorter segments, which may include active commute (AC) to school (Nordic Co-operation, 2014; Sirard, Riner, McIver, & Pate, 2005). It is therefore important that public health strategies must help to promote PA.

Active commuting to school has been proposed as a means of increasing children`s level of PA and contribute to protecting against non-communicable diseases and mortality (Engbers & Hendriksen, 2010; Kaczynski, Bopp, & Wittman, 2012; Nordic Co-operation, 2014; Sirard & Slater, 2008). AC is a health behavior which could easily become a habit and increase daily PA level (Chillón et al., 2013; Foley, Panter, Heinen, Prins, & Ogilvie, 2015; Sahlqvist et al, 2013; Sahlqvist, Song, & Ogilvie, 2012).

Several environmental factors influence AC among children (Pont, Ziviani, Wadley, Bennett, & Abbott, 2009). There has been a decline in active commuting in Scandinavia and Great Britain from the 1990s to 2010 (Fyhri, Hjorthol, Mackett, Fotel, & Kyttä, 2011). Children and youth represent both tomorrow`s and today`s transport users (The Norwegian Ministry of Transport and Communications, 2017). Small changes such as footpaths and bike paths, as well as the design of the bus stop and bus stations, have a significant impact on children`s opportunities to move in their everyday life (The Norwegian Ministry of Transport and Communications, 2017).

There is a need for more information about children`s commute to school, for instance, mode, distance traveled, duration of average commute and frequents of commute. Some interventions have been completed in an effort to increase active commuting to school and some are yet to come (Hoelscher et al., 2016; Sirard, McDonald, Mustain, Hogan, & Helm, 2015; Villa-González, Ruiz, Mendoza, & Chillón, 2017).

The main aim in this study was to find out to what extent transportation habits to school have changed among Norwegian primary school pupils from 2008 to 2018 and see if there were an interaction between time and sex, parental education, distance to school and ethnicity. A secondary aim was to present transportation habits to school according to sex, parental education, distance to school, and ethnicity in general.

1.1 OBJECTIVES

This master`s thesis is structured as follows: a comprehensive theoretical background of the study`s aim is presented in chapter two. In chapter three, the research paper is presented, including the following sections: background of the study, methods, results of the study, discussion of the result and conclusion. Chapter four provides an elaboration on the research paper with methodological and ethical considerations. In the last chapter, chapter five, a conclusion of the study is provided. References are attached at the end of each chapter. Research clearance, information sheet, declaration of consent and the different questionnaires used in this study are attached as additional files. The article manuscript in accordance with submission guidelines from BMC Public Health is attached.

2.0 THEORETICAL FRAMEWORK

2.1 THE IMPORTANCE OF BEING PHYSICALLY ACTIVE

2.1.1 EFFECTS OF BEING PHYSICALLY ACTIVE

A systematic review by Janssen and Leblanc (2010) reports a dose-response relationship between PA and positive health effects. Regular PA is associated with health benefits among all age groups and reduces mortality and morbidity in the general population, and contributes to preventing lifestyle-related diseases (Biddle & Asare, 2011; Janssen & Leblanc, 2010; Kopperstad, Skogen, Sivertsen, Tell, & Sæther, 2017; Nordic Co-operation, 2014). During the formative years, PA is important in mental, physical and social aspects of children's growth and development, including helping to set a pattern for participation in PA across the lifespan (Eime et al, 2013; Hills, Andersen, & Byrne, 2011; Nordic Co-operation, 2014; Smith et al., 2014).

Benefits from PA among children (,adults and elderly) could improve muscular and cardiorespiratory fitness, bone and functional health, reduce overweight and obesity, reduce the risk of hypertension, stroke, diabetes, coronary heart disease, several types of cancer, depression, anxiety and reduce the risk of falls as well as vertebral or hip fractures (Nordic Co-operation, 2014; Eime et al, 2013; Janssen & Leblanc, 2010; Poitras et al., 2016; Strong et al., 2005; Twisk, 2001; World Health Organization, 2018).

In children age 11-12 the journey to school provides a significant contribution to MVPA (Southward, Page, Wheeler, & Cooper, 2012). It is therefore important to support active commuting among school-age children (Southward et al., 2012). Studies by Stewart (2011) and Davison and coworkers (2008) confirm that active commuting is associated with higher levels of PA among adolescents, particularly among those who regularly walk or use a bike to school. Active commuting to school could according to Dalene and colleagues (2018) be an important target for future interventions to increase MVPA among children and adolescents.

A study by K. K. Davison et al. (2008) shows that children who walk or bicycle to school have better cardiovascular fitness in contradistinction to those who do not actively commute. Health benefits from walking or cycling to school include higher rates of PA, and improved cardiovascular and aerobic fitness among youth (Cooper, Andersen, Wedderkopp, Page, & Froberg, 2005; K. K. Davison et al., 2008).

2.1.2 PHYSICAL ACTIVITY RECOMMENDATION FOR CHILDREN

Physical activity is defined as any bodily motion performed by skeletal muscle which results in energy expenditure (Caspersen, Powell, & Christenson, 1985). PA is a term used to combine all kind of physical gestures, for instance, work, sports, exercising, hiking, playing, household, active commuting (walking/cycling), etc. (Bahr, 2017; The Norwegian Directorate of Health, 2016a).

Children

In line with the Norwegian physical activity recommendations for children, World Health Organization (WHO) recommend at least 60 minutes of physical activity with moderate to vigorous intensity every day, participating in more PA may provide further health benefits (Nordic Co-operation, 2014; World Health Organization, 2018). The PA should be at least 3 times a week and should incorporate aerobic and vigorous-intensity activities including strengthening muscle and bone (World Health Organization, 2010b). The children who walk or ride a bicycle to school are more active during the morning and afternoon and are better off reaching the daily PA recommendations activity level than their fellow peers who travel by car or bus (K. K. Davison, J. Werder, & C. Lawson, 2008; Pabayo et al., 2012; State Highways Authority, 2007; Sirard & Slater, 2008).

2.1.3 STATUS OF PHYSICAL ACTIVITY AMONG CHILDREN AND ADOLESCENTS

A study among Norwegian children and adolescents show that four out of five children meet the PA guidelines and that boys are more physically active than girls, (Kolle, Steene-Johannessen, Andersen, & Anderssen, 2010). In the study by Kolle and coworkers (2010), the results show a higher level of PA active during weekdays compared to weekends which may be explained by participation in organized sport and school activities during weekdays. Most children often report that they are walking or cycling to school, though, there are large seasonal variations regarding the type of transportation used to school (Børrestad, Andersen, & Bere, 2011). Seasonal variation in PA patterns has been documented as children tend to be more physically active during the spring compared to the fall or winter season (Kolle et al., 2010; Kristensen et al., 2008; Riddoch et al., 2007). Active commuting to school is high among Nordic children, however, this seems to decrease with age (Andersen, Lawlor, Cooper, Froberg,

& Anderssen, 2009; Børrestad et al., 2011; Johansson, Laflamme, & Hasselberg, 2011). A study by Dumith and colleagues (2011) have reported that PA level declines from childhood to adolescence, decreasing -7.0 percent per year.

2.1.4 THE IMPORTANCE OF PROMOTING PHYSICAL ACTIVITY AT A YOUNG AGE

van der Zee, van der Mee, Bartels, and de Geus (2019) study show that exercise behavior is moderate to high stable across the lifespan. A study by Falconer, Leary, Page, and Cooper (2015) show substantial tracking in active commute through adolescence. Childhood and adolescence are an important period for PA promotion as studies show that adults tend to continue to engage in sports activities that they were introduced to and engaged in at a young age (Ryan & Dzewaltowski, 2002; Telama, 2009). Studies also show that children from families with physically active parents tend to be more physically active themselves compared to children with inactive parents (Sigmund, Turonová, Sigmundová, & Přidalová, 2008; Zecevic, Tremblay, Lovsin, & Michel, 2010).

2.2 DETERMINANTS OF ACTIVE COMMUTING TO SCHOOL

2.2.1 THEORETICAL FRAMEWORK (MODEL)

There are several different theoretical frameworks and models describing health behavior, e.g. the social ecological model gives the insight to comprehend the factors affecting people's behaviors (Figure 1) and provides guidance for developing effective programs through social environments (Bronfenbrenner, 1977; e-Source, n.d). The social ecological model highlight the manifold levels of influence and that behavior equally shapes and are shaped by the social environment (Bronfenbrenner, 1977; e-Source, n.d). Ecological models are helpful to understand how people interact with their surrounding environment, especially important in our attempt in understanding behaviors that must be maintained over time, for instance, PA (Sallis & Owen, 2015). The social ecological model assumes that multiple levels of influence exist and that these different levels are interactive and reinforcing (Golden & Earp, 2012). One of the core themes in the social ecological model is that humans are influenced by a variety of factors such as behavioral patterns and personal attributes (Stokols, 1996). The same conditions may influence people differently depending on their health, personality, perceptions of environmental control, financial resources, and health practice (Stokols, 1996). The dynamic

play between personal and situational factors is emphasized rather than focusing only on biological, environmental or behavioral determinants of well-being (Stokols, 1996).

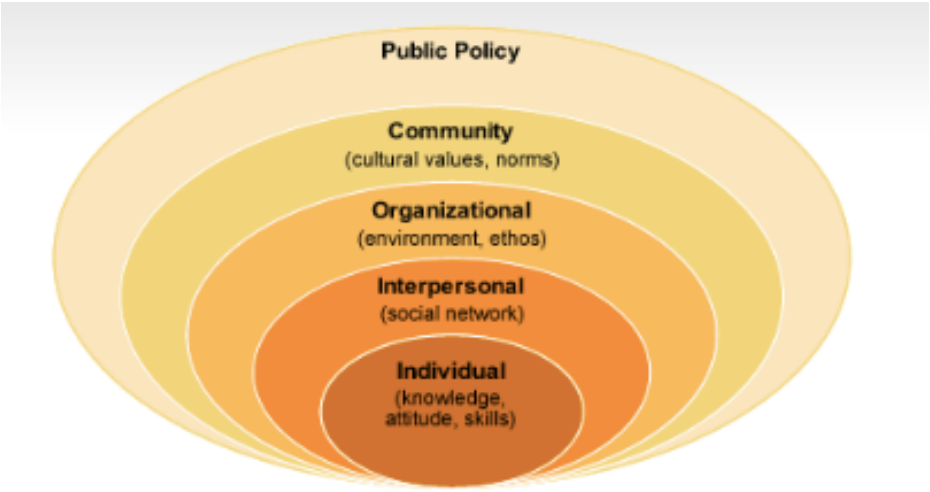

Figure 1. *Social Ecological Model. (Obtained from (Bronfenbrenner, 1977)).*

Bandura`s social cognitive theory (SCT) approaches the cognitive learning, particularly the observational learning and other cognitive processes where individuals adapt and interact with the social surroundings (Svardal, 04.06.2018). The theory has an agentic perspective towards human adaption, development, and change (Bandura, 2002). Socio-structural factors in SCT operates through several phycological mechanisms which produce behavioral effects. Such as economic conditions, education, socioeconomic status, and family structures. These influence a person's behavior through their impact on people's self-efficacy, personal standard and other self-regulatory influences (Bandura, 2001).

In AC to school there are several things that may influence the children`s active commuting behavior such as their self-efficacy for scheduling regular AC, overcoming different barriers and seeking social support (Lu et al., 2015; Ryan & Dzewaltowski, 2002). In accordance with SCT, children may be more likely to adopt active commuting if they have asked their parents for permission to walk or cycle (previous experience), if they observed that people around them walked or cycled often (vicarious experience/social modeling), if their parents or schools have persuaded them to walk or bike (verbal/social persuasion), or if they feel safe or happy walking or biking to school (emotional/physiological states) (Lu et al., 2015).

Two previously published studies have specifically presented theoretical frameworks describing conceptualizations of the determinants of AC to/from school (McMillan, 2005;

Sirard and Slater, 2008). The framework by McMillan (2005) assumes that up to a certain age, parents make the decision whether their child should use AC to school or not, and this decision is made based on parental perception on the built environment (Figure 2).

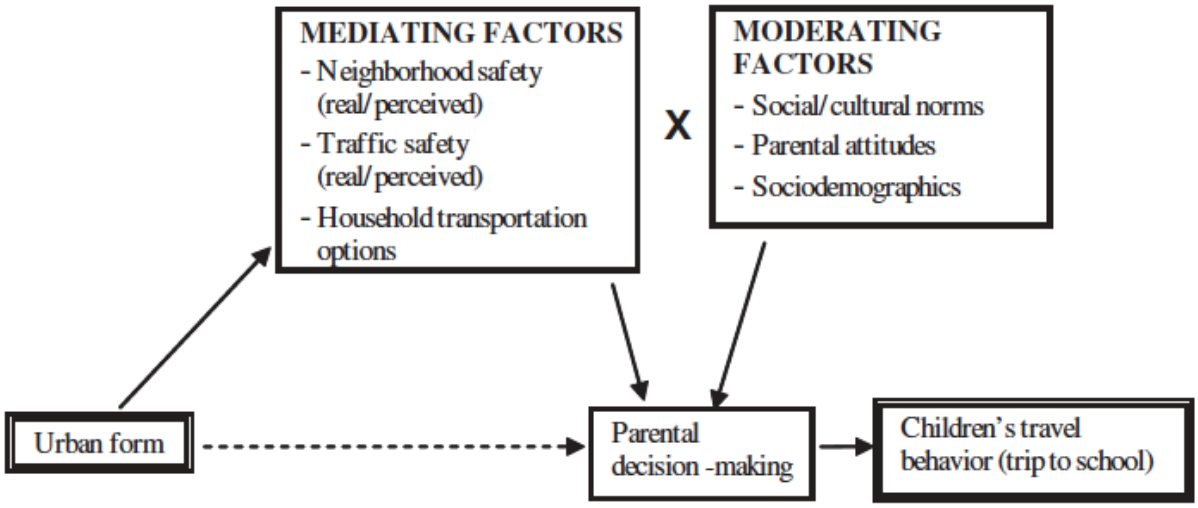

Figure 2. *Diagram of the Conceptual Framework of an Elementary-Aged Child`s Travel Behavior. (Obtained from (McMillan, 2005)).*

The elements of the built environment (urban form) may influence psychosocial factors, such as the perception of neighborhood safety, traffic safety and/or socioeconomic factors, such as household transportation options which influences the parents' decision on travel behavior of their child (to school). The model also describes moderating factors that may affect parental decision making about school commuting, including social and cultural norms, parent`s attitudes and sociodemographic variables.

Finally, the Ecological and cognitive active commuting framework has been developed based on elements from the social-ecological model, the McMillan framework, and social cognitive theory (Figure 3).

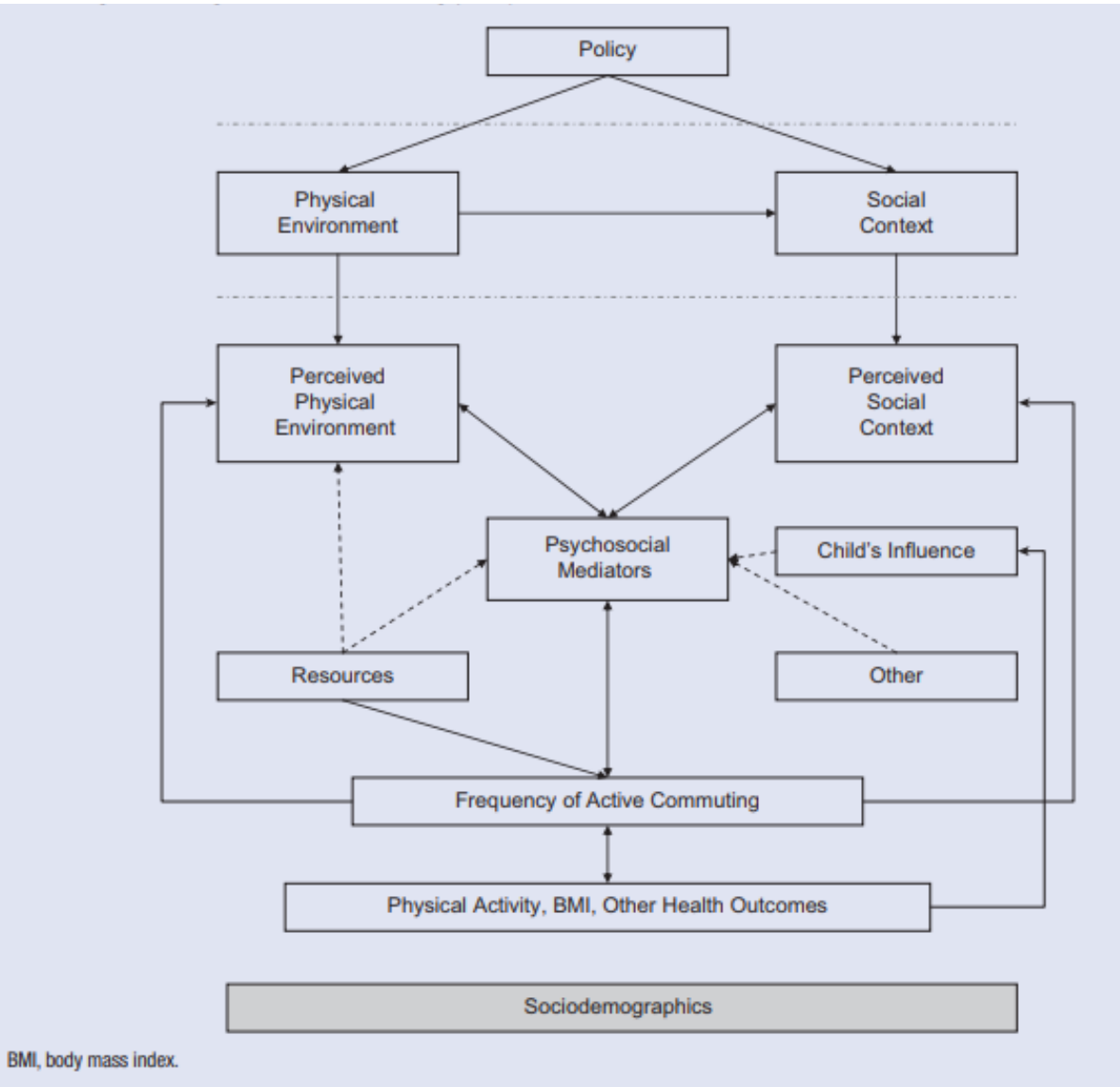

Figure 3. *The Ecological and Cognitive Active Commuting (ECAC) Framework. Obtained from Sirard and Slater (2008).*

This framework presented by Sirard and Slater (2008), influences on different levels of are taken into account, including policy, neighborhood and parent/family levels. In this model, socio-demographic factors would modify the parents' decision about allowing AC to school. The frequency of AC (outcome) affects and is affected by various factors (solid arrows indicate the suggested direction of the relationships and dashed lines represent relationships that are assumed to be of lesser importance or not yet unidentified). These frameworks are restricted to explain AC among children attending elementary school.

2.2.2 ENVIRONMENTAL DETERMINANTS OF ACTIVE COMMUTING TO SCHOOL

A combination of attitudinal, environmental and social factors is found to be associated with children`s AC behavior (J. Panter, Jones, Van Sluijs, & et al, 2010). A study by Langlois et al. (2017) shows that boys and girls from urban areas are more likely to be active commuters than those living in rural areas. The journey to school is a contributor to daily MVPA among children and adolescents (Southward et al., 2012). Another study concludes that distance to school is a strong predictor for active commuting to school, though this relationship is complex (Garnham-Lee, Falconer, Sherar, & Taylor, 2016). AC is also affected by other environmental predictors such as transport infrastructure, weather, social environment (like crime) and social norms (K. K. Davison et al., 2008).

The built environment not only promote or repress PA and active commuting, but also affect sedentary behavior (Stappers, Van Kann, Ettema, De Vries, & Kremers, 2018). Choices people make are partly shaped by the environments surrounding them and where they live (Stappers et al., 2018). Our health depends on the social and environmental context (Lakerveld & Mackenbach, 2017). National and international actions such as the design of the built environment and transportation system and providing a public green space may promote active commuting and a healthier lifestyle (Rutter et al., 2017). There is evidence that built environment designs are connected to promote an active lifestyle (Gao, Ahern, & Koshland, 2016). Cross-sectional studies from Gao et al. (2016), Sallis et al. (2016) and Gubbels et al. (2016) show positive associations between built environment and PA.

A study by Sallis et al. (2016) shows the need for more research on the combination of environmental features that in general explain the variation in PA instead of individual variables. However, there are tree environmental attributes who showed association to more total PA; net residential density, public transport density, and park density. Design of urban environment may contribute to achieving (both for children and adults) the daily recommendations for PA (Sallis et al., 2016). The natural and built environment make an impact on how PA people are, this by offering sufficient space for several types of activities. The surrounding environment attracts people outdoors, which often result in a form of PA such a walking (Hartig, Mitchell, Vries, & Frumkin, 2014). The physical characteristics of neighborhoods are likely to affect a person’s PA, such as availability, nature elements and quality of green space. For active commuting, other environmental factors like distance to

destination, suitable and safe infrastructure are also of importance (Hartig et al., 2014). Promoting people to get outside, using the natural and built environment people are more likely to reach the daily PA recommendations (Abraham, Sommerhalder, & Abel, 2010; Committee on Environmental Health, 2009; Taylor et al., 2007). A study by Stewart (2011) shows that urban form factors affect in the way that the adolescents commute to school is shaped by their parent`s opinions concerning the ability of the built environment to support different transportation options. The most important urban factors affecting AC according to Stewart (2011), was school distance from home, but also route barriers, walkability, density, network connectivity, non-motorizes infrastructure, and urbanization affected decision of whether to use AC to school or not. Other studies have also shown that distance and major road crossing are factors that affect the decision of transportation modes (Bringolf-Isler et al., 2008; Nelson, Foley, O'gorman, Moyna, & Woods, 2008).

Those living in neighborhoods with high population density and well-connected street networks are more likely to have short walking or biking distance to school using safe school routes (Stewart, 2011). A study by Stewart (2011) shows that the accessibility of different non-motorized transportation infrastructure features such as sidewalks or bike paths is positively associated with the use of AC. As shown in the models presented above, parents take part in the children`s choice to transportation mode, they interpreted their environment, for example, the social and natural surroundings like crime rates, traffic collisions or the weather (Stewart, 2011).

2.2.1 SOCIOECONOMIC STATUS AND PERSONAL DETERMINANTS OF ACTIVE COMMUTING TO SCHOOL

Socioeconomic status (SES) is a complicated concept in regard to children`s health behaviors such as PA and AC because socioeconomic status among children often is rated according to the status of the head of households, for instance, parent`s level of education (Langlois et al., 2017; Torsheim et al., 2004). Studies show a higher level of PA, including walking and AC among children with higher SES than those with lower SES (de Munter et al, 2012; Gubbels et al., 2016; Langlois et al., 2017; Stalsberg & Pedersen, 2010). A study by Stewart (2011) found a negative association with car ownership and children`s active commuting.

Education level is often positively associated with knowledge about the health benefits of PA, which may increase the use of AC to school (Stalsberg & Pedersen, 2010). A study by Stewart

(2011), however, include data on income, employment, education, household size, and neighborhood socioeconomic and show that those living in disadvantaged areas are more likely to use active commuting means rather than their wealthier counterparts.

Personal determinants, such as parental perceived barriers, effects their children use of commuting mode to school (Salmon, Salmon, Crawford, Hume, & Timperio, 2007). Salmon and coworkers (2007) show several social barriers to walking and cycling to school, presenting the need to work with the parents to help overcome barriers.

2.3 INTERVENTIONS FOR PROMOTING ACTIVE COMMUTING TO SCHOOL

Norway is a country with different climate and large seasonal variations in temperature, hours of day-light and rainfall (Kolle, Steene-Johannessen, Andersen, & Anderssen, 2009). It is therefore important to take the season into consideration when promoting PA among children (Kolle et al., 2009). Interventions should be implemented throughout the year. Interventions concerning AC to school involves three main elements: communities', schools and parents. School evolvement is important in an intervention. Among schools that follow the interventions made for them, there is often found an increase in AC to school (Chillón et al, 2011).

Gubbels et al. (2016) mention that intervention in green space is more likely to impact physical behavior like walking and cycling. Furthermore, Gubbels et al. (2016) findings show an increase in perceived nature was related to increased active commuting like walking. Built environment infrastructural changes may lead to changes in the total amount of PA and AC (Stappers et al., 2018).

Safe Routes to School program in the United States, which originally was developed in Denmark, is a response to make unsafe pedestrians and bicyclist environments for adolescents more secure (Stewart, 2011). Walking school bus is another public health effort to promote walking and cycling (K. K. Davison et al., 2008).

A systematic review by (Chillón et al, 2011) shows that interventions concerning AC to school could contain three elements such as school, parents and community's involvement and work for a specific goal. School involvement was common in all the interventions, and so it should be considering this is an important arena that affects children`s lives. The involvement of the school, parents, and community was in this study proven to have an effect. Most of the

interventions were economical invested, often by government funding for participating in implementation programs (Chillón et al, 2011). Nearly all the interventions reported an increase in AC to school. Several interventions were based on the Community Action Model framework (Bors et al., 2009; Chillón et al, 2011). The Community Action Model additionally focused on the 5 P`s: preparation, promotions, programs, policies and physical which could be applied to AC to school (Bors et al., 2009; Chillón et al, 2011). It is often used multi-level strategies in order to reach out and increase the chances to increase PA (Bors et al., 2009). In order to influence children, interventions must address a complex and varied array of factors, such as physical environment around the school, cultural norm, children`s social network, and economic characteristics of the families (Chillón et al, 2011; Pont et al., 2009). Interventions studies on AC to school is a relatively new field and interventions studies have development potential (Chillón et al, 2011).

2.4 POLICY REGARDING TRANSPORTATION TO PROMOTE PUBLIC HEALTH

The constitution of WHO´s principles call attention to that "governments have a responsibility for the health of their people (…)" (World Health Organization, n.d). The Norwegian state has initiated some strategies for increasing physical activity in society (The Norwegian Directorate of Health, 2016b).

The white paper *Prescription for a healthier Norway* enlightens the municipalities responsibility to secure the public the opportunity to be PA in their everyday life. To arrange for the public needs, it is required interplay between landowners, voluntary organizations and public sector (The Norwegian Directorate of Health, 2003). For the public to choose a lifestyle that promotes PA and health it is important with areal- and transportation planning. (The Norwegian Directorate of Health, 2003).

The Norwegian *National transportation plan 2018-2029* points out several conditions that affect adolescent's everyday life in their school commute. Learning how to ride a bike is a useful tool to increase children`s PA in everyday life. The goal is to get approximately 80 % of children to walk or use their bicycle in their school commute (The Norwegian Ministry of Transport and Communications, 2017).

In the paper *good health – collective responsibility* the Norwegian government of health wants, in cooperation with the government agency of transportation contribute to awareness-raising

efforts to promote increased awareness of cycling and walking such as active commuting and in measures to influence different populations to go or cycle more (The Norwegian Direction of Health, 2013). Good adaption is necessary to make it more attractive and safer to walk or ride a bicycle to school, work, and leisure activities. To get people to use active commuting is an important contribution in favor of increased everyday activity (The Norwegian Direction of Health, 2013).

Good life's in a safe environment emphasizes that closeness to an attractive green environment, as well as arrange for active commuting and easy access to public transportation, is important for the public health (Ministry of Health and Care Services, 2019). Among the Norwegian people, there are several people who do not fulfill the daily PA recommendations, therefore, a plan of action concerning PA is being made and planned released in the spring of 2019 (The Norwegian Institute of Public Health, 2018). The purpose of this plan of action is the goal of an activity-friendly society and reduce physical inactivity with 10 % by 2025, with arenas as transportation among other things (The Norwegian Institute of Public Health, 2018).

3.0 THE RESEARCH PAPER

Children´s Active Commuting to School: Changes in Transportation Habits from 2008 to 2018?

3.1 BACKGROUND

During childhood and adolescence, the importance of physical activity has been internationally accepted as a mean that provides fundamental health benefits (World Health Organization, 2010a). Children from ages 5 to 17 years is recommended a minimum of 60 min of moderate-to-vigorous physical activity (MVPA) every day or more (The Norwegian Directorate of Health, 2016a; World Health Organization, 2010a). Achieving the PA recommendation is associated with reduced risk of metabolic health (diabetes and obesity), cardiorespiratory health (coronary heart disease, cardiovascular disease, stroke and hypertension), musculoskeletal health (bone health and osteoporosis), different types of cancer (breast and colon cancer), mental health (depression, anxiety, self-esteem, cognitive functioning), functional health and prevention of falls (Becker et al., 2004; Biddle & Asare, 2011; Humphreys, McLeod, & Ruseski, 2014). Participation in PA may contribute to well-being such as physical self, confidence, self-acceptance, self-perception and enhance self-esteem in young people (Gill et al., 2013; Lubans et al., 2016).

Studies have shown the tracking of both PA and sedentary behavior follows from early childhood to adulthood (Deng & Fredriksen, 2018; Jones et al., 2013; Tammelin et al., 2014; Telama et al., 2005). PA and exercise including active commuting (such as walking and cycling) to school are valuable in the formative years, as it helps to set patterns in PA across the lifespan (Hills et al., 2011). Therefore, increasing children`s PA levels by the promotion of active commuting during the early years may increase the likelihood of an active lifestyle and reduced risk of chronic diseases related to inactivity in adulthood.

Active commuting more frequently could help children reach the daily PA recommendation (Nordic Co-operation, 2014; Humphreys et al., 2014; Lubans et al., 2016). The journey to and from school is an opportunity for children to develop a habit of walking or cycling (to active commute regularly) instead of being driven to school (Wen et al., 2007). Among children in primary school, walking to school is associated with overall higher PA compared to those who travel to school by motorized transportation (Cooper et al., 2005). Walking to school is associated with 24 minutes additionally MVPA among fifth graders (Sirard et al., 2005) and

cycling to school could be an important enhancement in the prevention of gaining weight, better the cardiorespiratory fitness and show better back muscle endurance compared to passive commuters (Østergaard et al, 2013). Studies also indicate that active commuting to school, especially cycling, is associated with healthier body composition (Lubans et al, 2011; Østergaard et al, 2013). Furthermore, there is a tendency that people who walk, are more active and show more MVPA, than those who travel by car or public transportation (Buehler, Pucher, Merom, & Bauman, 2011; Cooper et al., 2006; Sahlqvist et al., 2012; van Sluijs et al., 2009).

International studies among Australian, American and Canadian children show a decreasing trend of active commuting, such as walking and cycling to school, and an increased use of inactive commuting modes such as car or public transportation (Buliung, Mitra, & Faulkner, 2009; Grize et al, 2010; Kalman et al., 2015; McDonald, 2007; Van der Ploeg, Merom, Corpuz, & Bauman, 2008). A similar pattern is shown in European countries, where studies show a decrease in active commuting to and from school and an increase in the use of cars to transport children to school (Fyhri et al., 2011; Grize et al, 2010).

Investigating changes in active commuting among children may provide information and insight that may be used to develop tailored methods and intervention strategies to increase the use of active commuting among children. Thus, the main aim in this present study was to find out to what extent transportation habits to school have changed among Norwegian primary school pupils from 2008 to 2018 and see if there were an interaction between time and sex, parental education, distance to school and, ethnicity in general. A secondary aim was to present transportation habits to school according to sex, parental education, distance to school, and ethnicity in general.

3.2 METHOD

Sample and procedure

A cross-sectional survey was conducted during the autumn of 2008 and 2018. Due to significant differences in findings between the adjusted sample (18 schools participating both times) and unadjusted sample (27 schools in 2008 and 25 schools in 2018, but not all of them participated both times), the adjusted sample was used to conduct statistical analyses. The sample includes 18 schools which participated both in 2008 and in 2018 from two Norwegian counties, Hedmark and Telemark. Originally, these 18 schools participated in the Fruits and Vegetables Make the

Marks (FVMM) project (in 2001), in which schools were randomly selected within the counties of Hedmark and Telemark (Bere, Hilsen, & Klepp, 2010).

All 6th and 7th graders (age 10-12 years old) within these schools were invited to partake in a questionnaire survey. A total of 911 (participation rate: 53%) and 561 (participation rate: 32%) pupils agreed to participate in 2008 and in 2018, respectively. Participating children brought home a similar parent questionnaire to be completed by one of their parents. In total, 675 (participation rate: 39%) and 407 (participation rate: 23%) parental questionnaires were obtained in 2008 and 2018, respectively.

Ethical approval and research clearance were obtained from The Norwegian Social Science Data Services and research clearance from the ethical committees on the faculty for public health, sports, and nutrition for the University of Agder. Informed consent was obtained from parents and children prior to participation in the study. The data collection in 2008 and 2018, was completed by the children in the presence of a project member in the classroom with the baseline survey from FVMM in 2001 (with some moderations). One school lesson (from 45-60 minutes) was used to complete the questionnaire.

Instrument

Pupil questionnaire

The questionnaire includes questions concerning transportation habits where the participants were asked how they got to and from school. The pupils filled out a matrix (see additional file (pupils questionnaire)) answering how many days a week they usually (1) walk, (2) cycle, (3) are driven by car or (4) take public transport to and from school during the seasons fall, winter and spring. Each row had to add up to 5 days since the pupils attend school 5 days a week. The score would range from 0 to 10, giving the number of trips walking, cycling, car commuting and public transport commuting within each season and full school year (Table 2). Based on the average number of trips per week the participants were categorized into different modes of commuting if more than 50 % of the trips were conducted by that particular mode (for details concerning the matrix see (Bere & Bjørkelund, 2009)). Those who did not fall into a specific mode of commuting were classified as mixed commuters. The distance from school to home was reported by the pupils. The distance was categorized into living less than 4.0 km from school, and 4.0 or more from school (i.e. cut-off distance for free bus transport to school).

The pupils also reported sex (boy vs. girl) and ethnicity (which is determined by their parent's country of birth, if both parents were born in Norway, they were categorized to be ethnic Norwegian).

Parents questionnaire

The parents recorded the year they were born together with their own education level (dichotomized into high: having attended college or university, low: no college or university education) as an indicator for SES.

Statistical analysis

All statistical analyses were performed by utilizing the SPSS statistical software package version 25 (IBM Corp. in Armonk, NY). The significance level was set at $p < 0.05$.

Describing the sample, differences between 2008 and 2018 participants were analyzed using the chi-square test, for the categorical variables and independent t-test for continuous variables (Table 1). To describe the difference in the number of trips per transportation mode a Mann-Whitney u-test was conducted since the data were skewed (Table 2). The main analysis conducted was binary logistic regression with interaction analysis. The assumptions for logistic regression were checked. There were no significant findings in the interaction analysis. The results from the binary logistic regression were used. The analysis was performed separately on all dependent dichotomous variables, walkers (vs. not-walkers), cyclist (vs. not-cyclist), car commuter (vs. not-car commuters), public transport commuters (vs. not- public transport commuters), and mixed commuters (vs. not-mixed commuters). Each independent variable time (2008 vs 2018), sex (boy vs. girl), parental education (low vs. high), distance to school (less than 4 km vs. more than 4 km) and ethnicity (not-ethnic Norwegian vs. ethnic Norwegian) was tested individually. If p-value was < 0.25 they were included in a combined logistic regression (Bursac, Gauss, Williams, & Hosmer, 2008). Wherein the combined analyses independent variables were excluded if the p-value was <0.05. On the remaining independent variables, an interaction between the respective independent variables and time were included. The results from the analysis are given as the odds ratio (OR) with confidence intervals (95 % CI) who are given for each independent variable.

3.3 RESULTS

Descriptive data presented in Table 1 displays the eighteen schools participating both in 2008 and in 2018.

Table 1

Descriptive characteristics of the study sample from schools participating in both 2008 and 2018.

	2008	**2018**	**P-value***
Pupil data			
Participating pupils	911	561	
Participating rate of pupils (%)	53	32	
Sex of pupils (% girls)	52	57	0.071
Age of pupils (% seventh graders)	49	53	0.086
Distance to school (% less than 4km)	85	83	0.534
Parental data			
Participating parents	675	407	
Participating rate of parents (%)	39	23	
Sex of parent (% woman)	79	79	0.941
Age of parents (mean, years (SD))	41.1 (5.1)	42.4 (5.5)	0.001*
Education of parents (% with higher edu.)	55	69	0.001*
Ethnicity (% both parents Norwegian)	83	74	0.001*

P-value is based on independent t-test (*) for continuous variable and for dichotomous variables p-value are based on Chi Square test (**), p <0.05.
SD = Standard Deviation

Table 2 shows the number of trips per week using different modes of commuting to school. There was no overall significant difference in commuting mode between 2008 and 2018. Neither within the seasons the number of trips per transportation mode has changed significantly. Due to lack of response, the numbers of trips per week do not add up to 10. As seen for instance during the fall where the mean for (1) walking was 2.67 and 2.75 times/week, (2) cycling was 4.98 and 4.73 times/week, (3) car commuting was 0.46 and 0.46 times/week and (4) public transport commuting was 1.32 and 1.14 times/week in 2008 and 2018, respectively, adding up to 9.43 and 9.08 trips a week. There was no significant difference between the time periods.

Table 2

Self-reported frequency (number of trips) of different modes of commuting to school among pupils in 2008 and 2018.

Pupils		**Walking**			**Cycling**			**Car**			**Public transportation**		
n= 2099		2008	2018	p-value	2008	2018	p-value	2008	2018	p-value	2008	2018	p-value
Fall	Median	0.00	0.00	0.840	5.00	4.00	0.385	0.00	0.00	0.872	0.00	0.00	0.328
	(IQR)	(6.00)	(6.00)		(10.00)	(10.00)		(0.00)	(0.00)		(0.00)	(0.00)	
	Mean	2.67	2.75		4.98	4.73		0.46	(0.46		1.32	1.14	
	(SD)	(4.03)	(4.14)		(4.59)	(4.62)		(1.64)	(1.79)		(3.24)	(3.01)	
Winter	Median	9.00	9.00	0.417	0.00	0.00	0.947	0.00	0.00	0.223	0.00	0.00	0.835
	(IQR)	(10.00)	(10.00)		(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)	
	Mean	6.25	5.96		0.05	0.05		1.07	0.97		1.56	1.50	
	(SD)	(4.41)	(4.55)		(0.48)	(0.47)		(2.56)	(3.46)		(3.47)	(3.40)	
Spring	Median	0.00	0.00	0.226	5.00	5.00	0.829	0.00	0.00	0.549	0.00	0.00	0.160
	(IQR)	(6.00)	(5.50)		(10.00)	(10.00)		(0.00)	(0.00)		(0.00)	(0.00)	
	Mean	2.89	2.68		4.98	4.94		0.42	0.43		1.27	1.02	
	(SD)	(4.02)	(4.05)		(4.47)	(4.57)		(1.52)	(1.62)		(3.17)	(2.84)	
Average	Median	3.33	3.33	0.385	3.33	3.33	0.542	0.00	0.00	0.185	0.00	0.00	0.749
	(IQR)	(6.67)	(6.00)		(6.67)	(6.67)		(0.00)	(0.00)		(0.00)	(0.00)	
	Mean	3.94	3.80		3.34	3.24		0.65	0.64		1.38	1.22	
	(SD)	(3.46)	(3.49)		(2.85)	(2.91)		(1.65)	(1.74)		(3.21)	(2.88)	

Figures are the number of trips per week, p-value <0.05 are based on Mann-Whitney u-test.

SD = Standard Deviation

IQR = Interquartile range

In the final analysis (Table 3) the participants are categorized as walkers, cyclist, car -, and public transportation commuters. There was a difference with time (2008 vs. 2018) among children using public transport in their commute to school (OR = 0.62, 95 % CI: 0.40-0.97), showing that children were less likely to use public transportation in 2018. The findings show no difference with time (2008 vs. 2018) among walkers, cyclist or car commuters.

Differences in transportation habits according to sex, parental education, distance to school and ethnicity were identified. The results show that boys were less likely to walk (OR = 0.65, 95 % CI: 0.50-0.82) and more likely to cycle than girls (OR = 1.62, 95 % CI, 1.24-2.12). Children from parents with low education were less likely to use a bicycle to school (OR = 0.63, 95 % CI, 0.47-0.83) and more likely to be categorized as a car commuter (OR = 2.05, 95 % CI: 1.17-3.60) compared with children from parents with high education. Children living 4 kilometers or closer to school were more likely to walk (OR = 17.71, 95 % CI, 8.24-38-06), and cycle to school (OR = 6.08, 95 % CI, 3.79-9.76) than those living further than 4 kilometers away from school. Children living closer to school were less likely to use public transportation (OR = 0.02, 95 % CI, 0.01-0.03) than the children living further away. Finally, children not categorized as ethnic Norwegian were more likely to walk (OR = 1.73, 95 % CI: 1.29-2.31) than ethnic Norwegian children.

There were no significant interactions between and sex, parental education, distance to school or ethnicity.

Table 3

The odds ratio for being a walker, cyclist, car commuter, public transport commuter or mixed commuter for both 2008 and 2018, collected in two Norwegian counties in 2008 and 2018.

Pupils		**Total**	
n = 1472		**OR**	**(95% CI)**
Walkers	Year (2018 vs. 2008)	0.91	(0.70-1.17)
	Gender (boy vs. girl)	0.65*	(0.50-0.82)
	Distance (<4 km school/home vs. >4 km school/home)	17.71*	(8.24-38.06)
	Ethnicity (Not-Norwegian- Norwegian)	1.73*	(1.29-2.31)
Cyclist	Year (2018 vs. 2008)	0.96	(0.76-1.31)
	Gender (boy vs. girl)	1.62*	(1.24-2.11)
	Parental education (low vs. high)	0.63*	(0.47-0.83)
	Distance (<4 km school/home vs. >4 km school/home)	6.08*	(3.79-9.76)
Car commuter	Year (2018 vs. 2008)	1.58	(0.90-2.77)
	Parental education (low vs. high)	2.05*	(1.17-3.60)
Public commuter	Year (2018 vs. 2008)	0.62*	(0.40-0.97)
	Distance (<4 km school/home vs. >4 km school/home)	0.02*	(0.01-0.03)

**Significant difference between groups based on interaction binary logistic regression, $p<0.05$.*

3.4 DISCUSSIONS

In the present study, the results indicate a change in the use of public transportation among Norwegian children between 2008 and 2018, which has been reduced from 2008 to 2018. There are few changes between 2008 and 2018, we see a similarity in the number of trips taken per week using specific modes of transportation to school.

In our study, children were more likely to use public transportation to school in 2008 than in 2018. Some studies have shown increased use of cars from the 1990s to 2010 as transportation mean to school, there are, however, few that mentions the development in public transportation (Fyhri et al., 2011; Grize et al, 2010).

Due to the focus on positive health effects of increasing PA level and using sustainable transportation modes, one can wonder why there is not an increase in active commuting among children in 6th and 7th grade. A study by Duncan, White, Mavoa, Stewart, Hinckson & Schofield shows that active commuting to and from school is affected by the distance (Duncan et al., 2016). The probability of active commuting to school decreases as the distance increases (Duncan et al., 2016).

Whereas our study did not show any changes in the use of active commuting methods to school between 2008 and 2018, studies from several European countries have shown a decline in use of active commuting to school during the same time period (Buliung et al., 2009; Fyhri et al., 2011; Grize et al, 2010; Kalman et al., 2015; McDonald, 2007; Van der Ploeg et al., 2008). However, in line with the present study, a study among Canadian children did not show any changes in transportation habits between 2007 to 2015 (Colley et al., 2017).

Although results from the present study do not reveal large differences in modes of transportation between 2008 and 2018 among the total sample of participants, significant differences were observed according to sex, parental education, distance, and ethnicity.
In line with the results from our study, previously published studies have confirmed that boys are more engaged in AC to school and sport/exercise than girls (Brown, Mackett, Gong, Kitazawa, & Paskins, 2008; Chillón et al, 2011; Colley et al., 2017; Cooper, Page, Foster, & Qahwaji, 2003; Kalman et al., 2015; Tudor-Locke, Ainsworth, Adair, & Popkin, 2003; Østergaard et al, 2013). The present study, however, does explore differences in the level of PA between boys and girls after school or during school hours. Other studies which also have

included focus on PA/AC during school hours and/or after school, have confirmed that those actively commuting to school have a higher total level of PA per day compared to those not using active commuting to school and boys tend to be more PA than girls (Brown et al., 2008; Chillón et al, 2011; Colley et al., 2017; Cooper et al., 2003; Kalman et al., 2015; Tudor-Locke et al., 2003; Østergaard et al, 2013). Although a higher total number of boys compared to girls in the present study reported to use active commuting modes to school, the results revealed a higher number of girls walking to school compared to boys. On the other hand, a higher number of boys reported to cycle to school compared to girls. However, studies conducted by McDonald et al. (McDonald, 2012) is the US and Nelson et al. (Nelson & Woods, 2010) in Ireland shows that boys were more likely to use bicycle than girls, but unlike our results, these studies also showed that boys were more likely to walk than girls.

The present study also shows that children from parents with low education were less likely to cycle and more likely to get driven to school compared to children from parents with high education. These findings are in line with results from another study, in which children with high SES are more likely to be walkers or cyclist and also more likely to meet the PA recommendations than children with low SES (Kalman et al., 2015). In line, the results from the present study, a positive association between parental education and the use of active commuting to school has previously been identified (Drake et al., 2012). Parents education is proven to contribute to enhance PA amongst their children (Sirard & Slater, 2008). A study by Kerr, Rosenberg, Sallis, Saelens, Frank & Conway (2006) acknowledge that high parental education positively affects children`s use of active modes of commuting and therefore suggest that studies should focus on increasing parental education and knowledge in order to promote increased use of active communication in children (Kerr et al., 2006).

Distance from school also seems to affect modes of transportation in the present study. The distance from home to school is an essential element that could explain AC to school. Children who lived close to school (<4 km) were more likely to walk or cycle, and less likely to use public transportation. A study by D`Haese, Meester, Bourdaudhuij, Deforche, and Cardon (2011) also concludes that the distance from home to school is an important predictor for AC (D'Haese et al, 2011; Nelson et al., 2008; Wilson, Marshall, Wilson, & Krizek, 2010) and other studies have shown that the use of active modes of traveling declined as the distance to school increased (McDonald, 2007; Mendoza et al., 2010; Rojas Lopez & Wong, 2017; Schlossberg, Greene, Phillips, Johnson, & Parker, 2006; van Sluijs et al., 2009).

Finally, results from the present study also show that ethnic Norwegian children were less likely to walk than non-ethnic Norwegian, but the results do not show other significant differences in transportation modes according to ethnicity. To the author`s knowledge, few studies have previously compared transportation habits among children from different ethnic groups in Norway.

Limitations and Strengths

There are some limitations and strengths to this study that should be noted. A strength of the present study is the large sample and the use of the comprehensive matrix design to explore the number of trips children take during fall, winter, and spring within using different modes of transportation to school (Bere & Bjørkelund, 2009; Bjørkelund, Degerud, & Bere, 2016).

Another strength is that the study includes repeated data from numerous randomly selected schools from the first sample of the study in 2001. In addition, gender representation in the study is quite evenly distributed. Although the present study included only participants from two of Norway's 19 counties. Still, Norway is a rather homogenous country (according to geography and population traits) which makes us believe that the results may be generalizable to the other counties as well (Bere, Glomnes, te Velde, & Klepp, 2008). Another strength in this study is that the participating schools in these two counties were similar in terms of geography and socioeconomic composition (Bere, Veierød, & Klepp, 2005).

A limitation of the present study was that the measure of transportation to school was self-reported. Self-reported data could affect the results as participants may answer differently (Shephard, 2003). Another limitation is that various ethnic groups may respond differently, but the dichotomization of ethnicity used to present data in this study may prevent insight in variations regarding use of active commuting among different ethnic groups (Børrestad et al., 2011). Another limitation of the present study is the skewed and high proportion of participants with high parental education. Thus, the participants are not representative for the SES distribution of SES among parents living in Norway (Statistics Norway, 2018). Finally, the cross-sectional design makes it impossible to draw conclusions concerning the exact causal relationship concerning active commuting and determinants.

3.5 CONCLUSION

In conclusion, the results indicate that public transportation habits declined from 2008 to 2018 among Norwegian primary school pupils. The results show no significant change in the use of other modes of transportation, such as walking, cycling or driving cars between 2008 and 2018. However, the study showed significant changes in transportation habits according to sex, parental educations, distance to school and ethnicity in general. Boys walk more but cycled less, children with parent`s who had higher education cycled less and was driven more, those living closer to school used more active commuting and not ethnic-Norwegians were more likely to walk.

More knowledge about commuting habits among children is important to identify positive and negative determinants as well as effective models for promoting increased use of active commuting in intervention studies and related to policymaking. Additionally, future public health strategies should encourage an elevated level of active commuting and create an environment promoting an AT choice.

4.0 ELABORATIONS ON THE RESEARCH PAPER

4.1 METHODOLOGICAL CONSIDERATIONS

4.1.1 STUDY DESIGN

The current study includes two cross-sectional studies targeting a population living in the same region in 2008 and in 2018. An advantage by using a repeated cross-sectional design is that the collected data may be used to study time trends and possible changes in correlation between variables (Polit & Beck, 2018). It is also inexpensive and takes little time to conduct. Repeated cross-sectional studies are a great resource for studying time trends and how relationships vary over time (Lebo & Weber, 2015). A limitation with the cross-sectional study design is that it is difficult to make a casual connection and it only provides a snapshot of the situation (Levin, 2006; Polit & Beck, 2018). Furthermore, this design does not provide information about individual changes over time (Rafferty, Walthery, & King-Hele, 2015).

4.1.2 SAMPLE

In the FVMM study, participants from two Norwegian counties, Hedmark, and Telemark were included. These counties are similar with respect to geography (both situated in south-eastern Norway) and socioeconomic positions of inhabitants. Hedmark and Telemark are two rural counties and contains smaller municipalities and villages. Norway is a fairly homogenous country with a minor difference and the result can likely be generalized to the entire population (Bere et al., 2008).

In 2001, 48 primary schools were randomly selected (24 in each county) and were invited to participate in the FVMM study (Fruits and Vegetables Makes the Mark). A total of 38 (19 per county) schools agreed to participate (Bere et al., 2005).

In 2008 and 2018 the same 38 schools were invited to participate, and 27 and 25 schools agreed to participate in 2008 and 2018, respectively. All 6^{th} and 7^{th} graders (aged 10-12 years old) attending these schools were invited to take part in the questionnaire survey. A total of 1339 pupils (participation rate: 78 %) participated in 2008 and 760 pupils (participation rate: 44 %) participated in 2018. The participating children brought home a similar parent questionnaire to be completed by one of their parents. In total 996 (participation rate: 74 %) and 609 (participation rate: 80 %) parental questionnaires were obtained in 2008 and 2018, respectively (Figure 4).

Due to significant differences in findings between the adjusted sample and unadjusted sample when looking at the number of trips per week during the school year, the adjusted sample was taken on further on to conduct the main analysis. The adjusted sample was adjusted by including only the schools who participated both in 2008 and in 2018, instead of schools that participated one or both times, as showed in Figure 5. Using the unadjusted sample would not provide the same image of the changes happening between 2008 and 2018. Even though the sample is smaller after the adjustment, it is a more accurate sample adequate for the aim of this paper.

The adjusted sample (Figure 5) consists of 18 schools which participated both in 2008 and in 2018 to give a better view of the time-trend in transportation mode. The sample then contained 911 (out of 1712 eligible, participation rate: 53 %) participating pupils in 6th and 7th grade in 2008 and 561 (out of 1734 eligible, participation rate: 32 %) participating pupils in 2018. Among the parents, 675 replied in 2008 (participation rate: 74%), and 407 in 2018 (participation rate: 73%). Among the 911 and 561 participants, there were 52 % and 57 % of girls. In parental participation, there were 79 % women both in 2008 and 2018.

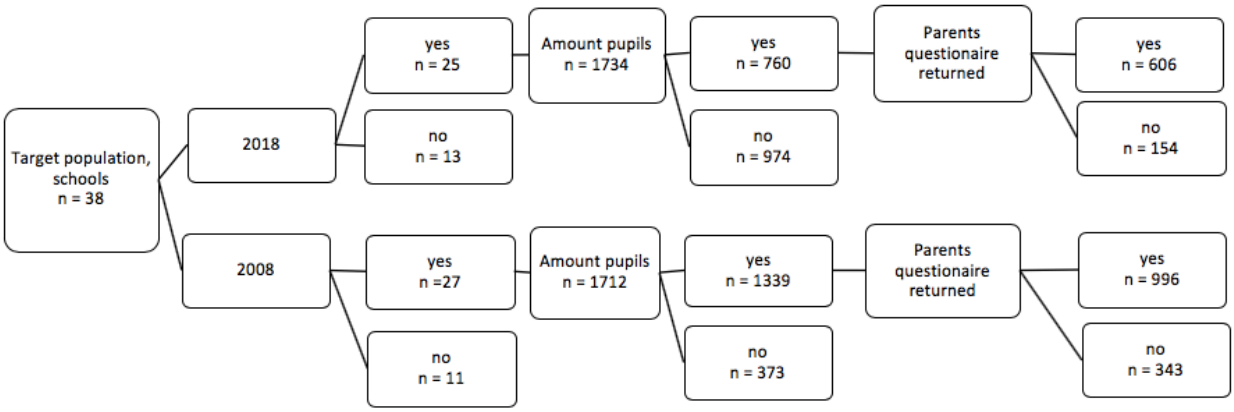

Figure 4. *Shows the unadjusted study sample, containing all the schools participating either 2008 or 2018 or both times. Which was not included in the analysis.*

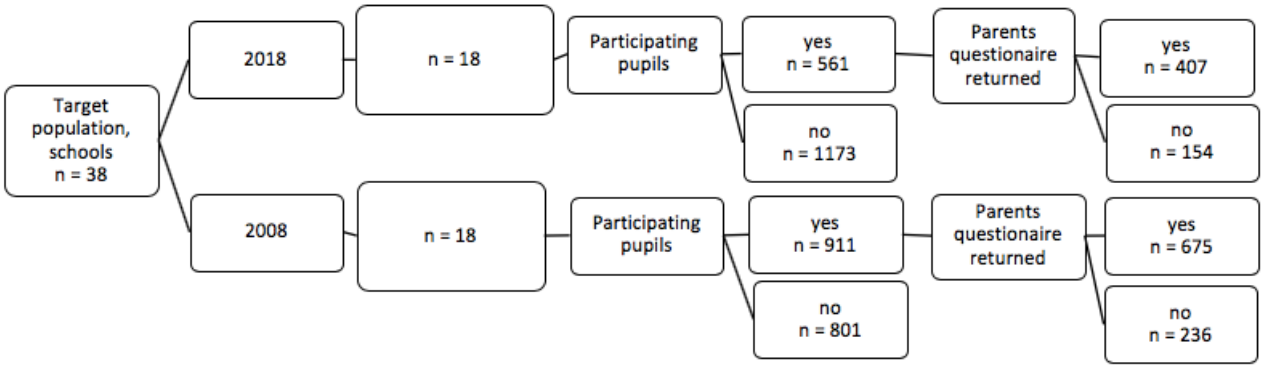

Figure 5. *Shows the adjusted study sample, containing the schools who participated both in 2008 and 2018, which was included in the analysis.*

Unfortunately, we did not have any information about the reasons for not participating in the study or characteristics of the children and their parents who did not participate in the study. Furthermore, it is unclear what caused the reduction in the participation rate in 2018 compared to 2008 since we used identical procedures when recruiting participants and collecting data.

4.1.3 MEASUREMENT

A self-report questionnaire has been used to collect data. This is a common method to use when collecting data from large population groups to a low cost in quantitative studies and has been used in several European and Norwegian studies (Alton, Adab, Roberts, & et al, 2007; Bere & Bjørkelund, 2009; Børrestad et al., 2011; D'Haese et al, 2014; Ducheyne et al, 2012; Loucaides, Jago, & Theophanous, 2010; Page et al, 2010; Panter et al, 2013; J. Panter et al., 2010; J. R. Panter, Jones, Van Sluijs, & Griffin, 2010; Aarts, Mathijssen, van Oers, & Schuit, 2013). The questionnaire survey was done by the pupils sitting in classrooms during one school hour (45-60 minutes). Project workers were present during the survey for guidance and questions of the participants. The assignment for the project workers was to provide clear information about the purpose of the study, provide an identification number for sustained anonymity and help the pupils with guidance on how to fill out the questionnaire. There were one, two or three project workers attending the classrooms during the data collection based on the number of pupils in the classes.

The questionnaire consists off open-ended and closed-ended questions to collect information from the participants. Close-ended questions make it possible to compare responses and facilitate analysis in our study. A disadvantage with close-ended questions is that the researchers might omit potentially responses (Polit & Beck, 2018). Open-ended questions allow us to give the participants a more free approach in their response to our questions and could provide richer information than close-ended questions (Polit & Beck, 2018). The questionnaire in our study contained both open-ended and close-ended questions. Questions about the participant`s sex and socioeconomic status were close-ended, while the country of birth, distance to school, and trips per week on different transportation mode were open-ended. In the open-ended questions, the participants filled out where they and their parents were born, the distance to school measured in kilometers, and the number of trips taken on each transportation mode during different seasons. This might be a weakness because all the answers were not easy to interpret when plotting the data, it is also possible that the children do not recall how they get to school during the different seasons. The participants themselves have reported their distance to school and the number of trips with the different transportation modes. Participants often overrate themselves and want to present them in the best possible way, overreport may, therefore, be a challenge (Polit & Beck, 2018).

Reliability refers to the reproducibility of measurement, and if reliability is high, measurement errors are small (Polit & Beck, 2018). Bere and Bjørkelund (2009) tested the reliability of the questionnaire and the transportation matrix measuring the frequencies of different modes of commuting to school in Norway. The transportation matrix and has been proven to have a good test-retest reliability and was good for assessing the frequency of different commuting modes to/from school, because the number of trips did not differ for any transportation modes comparing the test and retest for any seasons, and the p-values were all less than 0.001. The questionnaire used in this study is a modified version of Bere and Bjørkelund (2009) which is a reliable tool for measuring active commuting to school in Norway. Furthermore, the questionnaire and transportation matrix has also been used in other studies, including a study by Larouche et al. (2017).

Measurement of transportation habits and distance to school

In the questionnaire, respondents were asked about transportation habits and factors that may affect their traveling method. They were asked how they got to/from school yesterday (walked, cycled, driven to school or took public transportation), how far is it from your home to school (km), they then had to fill out a transportation matrix. In this matrix, they would write how many school days a week they would walk, bicycle, use car transportation or public transportation to and from school during a school year (fall, winter, and spring). They were then asked how long it took to walk/bicycle to/from school, if they enjoy walking/bicycling to school, if they are afraid something dangerous would happen on their way to school, if the school road was safe and, in the end, if they walk/bicycle to/from school even if the weather is bad.

A weakness concerning questions about the distance to school is that the project workers had different approaches when children asked for help. Some told the children who asked for help, that they should write down what they thought the distance was. Other project workers used http://maps.google.no to calculate the distance from the pupil`s home to school by choosing the "optimal route by foot". Some pupils also asked questions such as: "How far are 10 minutes in kilometers?", indicating that some results were less reliable. A study by Tetali, Edwards, Murthy, and Roberts (2015) concluded that estimated distance based on the `nearest landmark to home` can be a reasonably accurate method for estimation of the distance from a child`s home to school. Therefore, children taking landmarks such as a grocery store or a football field, etc. in this study, may most likely have provided a reasonably accurate estimate of the distance to school. Another weakness of the methods used in the present study is that it might be difficult to remember back in time exactly how many days a week one uses the different transportation modes.

A study by Evenson, Neelon, Ball, Vaughn, and Ward (2008) finds that questionnaire done by young schoolchildren to assess travel to and from school, including mode and destination, was reliably collected and indicated that for most of the items was valid when they were compared with parental reports. Furthermore, Tetali et al. (2015) found that self-administered questionnaires provided reliable information on travel to school. In a previously published study the respondents answered the following question "how did you get to school today", and the authors concluded that this was a valid and reliable instrument for assessing school travel outcomes among 9-11-year-old children (Mendoza et al, 2010). Considering our survey

contains the same question with similar response alternatives, indicates that the results from our study also have high reliability and validity.

Measurement of socioeconomic status

In the present study, parental education is used as indicators of SES. The parents have provided information about their own educational level. SES is ranged from low to high, this is not intended disparagingly, but is necessary to make a scale from bottom-to-top when it comes to how much education the person has (Elstad, 2005).

Individuals have different positions in the social hierarchy, which is multidimensional and different SES factors may affect health on several levels (Dahlgren & Whitehead, 1991). Income, education, and occupation are separately useful to implicate where a person is on the SES hierarchy (Elstad, 2005). Parental education is a stable aspect of SES since it is established early and often remain the same over time (Sirin, 2005). Parental education may also be an indicator of a parent`s income because income and education often are correlated (Sirin, 2005). It is important to acknowledge the possible multifactorial and complex aspects of SES which is not measured, by not including factors from different levels. Even though we classify people into high or low SES, this does not necessarily say anything about the individuals but the SES health differences (Elstad, 2005).

In this study, one parent filled out the questionnaire where they were asked "how long education do you have" and "how long education does your partner have". In line with several previously published studies, results from this study were adjusted for maternal education (Smith et al, 2010; Timperio et al., 2006; Timperio, Salmon, Telford, & Crawford, 2005; Veitch et al., 2017). Maternal education has proven to have distinctive influence on children's health (Boyle et al., 2006; Cleland et al., 2011; Desai & Alva, 1998; Hnatiuk, Ridgers, Salmon, & Hesketh, 2017; Wamani, Tylleskär, Åstrøm, Tumwine, & Peterson, 2004). Maternal education is used instead of paternal education in this study because maternal determinants have proven to be significant predictors in children`s health behavior (Chen & Li, 2009; Kalil, Ryan, & Corey, 2012; Lindeboom, Llena-Nozal, & van Der Klaauw, 2009).

When measuring the children's SES, the education level of the parent who responded to the questionnaire was assessed. One can argue that considering we asked for both parents' education, the household income and both of their employment that all could be used to measure SES in this study. Measuring one parent does not inevitably reflect the education level within the family. However, in public health research, it is common that the educational level is used as a measure of SES. Once obtained a person`s education level remains the same throughout their lifetime and is, therefore, a rather stable variable. One advantage of including education as an indicator for SES is that in the self-reported questionnaire in this study makes it relatively easy to measure (Galobardes, Shaw, Lawlor, & et al, 2006).

It is important to consider mothers and fathers influence on health-related behavior separately because a collective measure could conceal relationships (Friestad & Klepp, 2006). The participant`s education level rises an issue, in 2008 and 2018, 55 % and 69 % of the study population was highly educated compared to 33.4 % of the Norwegian population in general (Statistics Norway, 2018). Evenson, Huston, McMillen, Bors, and Ward (2003); Martin, Lee, and Lowry (2007); Mota et al. (2007); Shi, Lien, Kumar, and Holmboe-Ottesen (2006) concludes that a higher parental education level is associated with lower rates of children`s AC. However, among the studies examining parental education and AC among children seven of the studies reported non-significant associations between parental education and children`s AC (Pont et al., 2009).

There is always a possibility for nonresponse bias because the participant`s reasons for not wanting to participate are unknown as well as the speculation surrounding which educational level they had. One must also take into conidiation the response bias such as social desirability where the participants both pupil and parent may give answers that are consistent with prevailing social views (Polit & Beck, 2018).

Measurement of ethnicity

In the present study, ethnicity was measured from the pupil's response in the questionnaire. The pupils were asked "where were you born", "where was your father born" and "where was your mother born". This was an open-ended question the pupils themselves filled out the answer. The parent`s birthplace was combined and categorized as Norwegian or Not-Norwegian. If both parents were born in Norway, their children were categorized as Norwegian. If one or both parents were born outside of Norway, their children were categorized as Not-Norwegian. The

same categories have been used in the previous study conducted by the FVMM project, such as Børrestad et al. (2011). The participants are not classifying themselves into an ethnical group but writing where they were born. This question has no right or wrong answers, and children may therefore not reflect what the researcher wants, but instead just write down where they were born. It is the researcher who then categorizes them into a category like previous studies mentioned above.

Traditionally a single question allowing to respond in a pre-defined list is often used and has been problematic (Burton, Nandi, & Platt, 2010). Ethnicity is a complex and multi-dimensional concept and it is proposed by Burton et al. (2010) to ask several questions to capture the complexity of the concept.

4.1.4 STATISTICAL ANALYSES

In the present study, a binary logistic regression model analysis was used where the procedure analyzes the relationship between one or more independent variables and a categorical dependent variable (Polit & Beck, 2018). Binary logistic regression can be a powerful analytical technique for use when the outcome variable is dichotomous (Peng, Lee, & Ingersoll, 2002). We use binary logistics regression because we want to predict membership of two categorical outcomes (Field, 2014). The odds ratio after a binary logistic regression indicates the change in odds resulting from a change in the predictor (Field, 2014). The logistic regression analysis has good validity because of the large sample (Steyerberg et al., 2001).

In this study, it is the time-change in transportation mode from 2008 and 2018 that is the main interest when analyzing data and if the changes over time were different for the variables gender, SES, distance and ethnicity. By using binary logistics regression model, we get to analyze the relationship between multiple independent variables and turn the probability of an occurring action into odds (Polit & Beck, 2018).

4.2 ETHNICAL CONSIDERATIONS

Ethical approval and research clearance for the FVMM-study was obtained from The Norwegian Social Science Data Services and research clearance from the ethical committees on the faculty for public health, sports, and nutrition for the University of Agder. Informed

consent was obtained from parents and children prior to participation in the study. Participants were informed that they could at any time withdraw from the study. In addition, to having the opportunity to withdraw, the participants also had the option to leave a question unanswered. Research on children and their lifestyle habits are important and valuable in a public health aspect (Backe-Hansen, 2016). Giving that the study participants are 10-12 years old, the participants in our study needed to get consent from their parents. It is important to adapt methods and questionnaires used according to participants age and changes in situations over time (Backe-Hansen, 2016). Therefore, the questionnaire, used in 2018 is slightly modified compared to the questionnaire used in 2008.

Transportation habits are not considered as sensitive information. Assessing SES and health of participants, on the other hand, may be considered as sensitive measures, and participants may be of reluctant to report such information or provide incorrect information.

5.0 CONCLUSION AND FURTHER IMPLICATIONS

A decrease in public transportation among children in 6th and 7th grade from 2008 to 2018 were found. Other transportation habits such as walking, cycling, and transportation by car did not show any changes. Additionally, we found changes in transportation habits in relation to sex, parental education, distance to school and ethnicity. Changes such as, boys walked more but cycled less, children with parents who had higher education cycled less and was driven more to school, those living closer to school used more active commuting and not ethnic-Norwegians were more likely to walk to school.

Exploring active commuting is an important contributor to public health because it has the potential to increase the daily PA level among children and adolescents. It is interesting that there is so little change among the transportation habits from 2008 to 2018, due to the community focus towards physical activity and sustainability. In order to better understand children`s commuting habits, future research on parental influence, objective measurements on children`s traveling mode, and objective measurements on distance from home to school should be explored. Perhaps investigating commuting to other arenas such as leisure activities. For instance, how many are getting there by active or inactive commuting, is there a potential of improvement here? Understanding more about why children travel the way they do could make it easier to early on map out where and how future interventions should be conducted in order to increase active commuting among children and adolescents. Most of the children in this study are walkers or cyclist, among the proportion commuting by public transportation there is a tendency that they live far away. There are few that are driven by car, it would, therefore, be interesting to look deeper into how many among those driven that could have walked or cycled to school. It is most likely among those driven to school the potential of improvement on active commuting is located. Additionally, it would be interesting looking into children`s PA levels during the weekends and see if there are and how small/large the changes in PA levels might be. Future research on this subject could resolve in strategies (targeting schools and other areas) that could provide positive short- and long-term consequences which could establish healthier habits and health benefits.

REFERENCES

Abraham, A., Sommerhalder, K., & Abel, T. (2010). Landscape and well-being: a scoping study on the health-promoting impact of outdoor environments. *International Journal of Public Health, 55*(1), 59-69. Retrived from https://link.springer.com/content/pdf/10.1007%2Fs00038-009-0069-z.pdf

Alton, D., Adab, P., Roberts, L., & et al. (2007). Relationship between walking levels and perceptions of the local neighbourhood environment. *Archives of Disease in Childhood, 92*, 29-33. Retrieved from doi: http://dx.doi.org/10.1136/adc.2006.100826

Andersen, L., Lawlor, D., Cooper, A., Froberg, K., & Anderssen, S. (2009). Physical fitness in relation to transport to school in adolescents: the Danish youth and sports study. *Scandinavian journal of medicine & science in sports, 19*(3), 406-411. Retrieved from doi: https://doi.org/10.1111/j.1600-0838.2008.00803.x

Backe-Hansen, E. (2016, 08.02.2016). Children. Retrieved from https://www.etikkom.no/en/library/topics/research-on-particular-groups/barn/

Bahr, R. (2017). *Physical activity.* Retrieved from https://sml.snl.no/fysisk_aktivitet

Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology, 52*, 1-26. Retrieved from doi: https://doi.org/10.1146/annurev.psych.52.1.1

Bandura, A. (2002). Social cognitive theory in cultural context. *Applied Psychology, 51*(2), 269-290. Retrieved from doi: https://doi.org/10.1111/1464-0597.00092

Becker, W., Lyhne, N., Pedersen, A. N., Aro, A., Fogelholm, M., Phorsdottir, I., . . . Pedersen, J. I. (2004). Nordic Nutrition Recommendations 2004 - integrating nutrition and physical activity. *Scandinavian Journal of Nutrition, 48*(4), 178-187. Retrieved from doi: https://doi.org/10.1080/1102680410003794

Bere, E., & Bjørkelund, L. A. (2009). Test-retest reliability of a new self reported comprehensive questionnaire measuring frequencies of different modes of adolescents commuting to school and their parents commuting to work-the ATN questionnaire. *International Journal of Behavioral Nutrition and Physical Activity, 6*(68). Retrieved from doi: https://doi.org/10.1186/1479-5868-6-68

Bere, E., Glomnes, E. S., te Velde, S. J., & Klepp, K.-I. (2008). Determinants of adolescents' soft drink consumption. *Public Health Nutrition, 11*(1), 49-56. Retrieved from doi: https://doi.org/10.1017/S1368980007000122

Bere, E., Hilsen, M., & Klepp, K.-I. (2010). Effect of the nationwide free school fruit scheme in Norway. *British Journal of Nutrition, 104*(4), 589-594. Retrieved from doi: https://doi.org/10.1017/S0007114510000814

Bere, E., Veierød, M. B., & Klepp, K.-I. (2005). The Norwegian School Fruit Programme: evaluating paid vs. no-cost subscriptions. *Preventive Medicine, 41*(2), 463-470. Retrieved from doi: https://doi.org/10.1016/j.ypmed.2004.11.024

Biddle, S., & Asare, M. (2011). Physical activity and mental health in children and adolescents: a review of reviews. *British Journal of Sports Medicine, 45*, 886-895. Retrieved from doi: http://doi.org/10.1136/bjsports-2011-090185

Bjørkelund, O. A., Degerud, H., & Bere, E. (2016). Socio-demographic, personal, environmental and behavioral correlates of different modes of transportation to work among Norwegian parents. *Archives of Public Health, 74*(43). Retrieved from doi: https://doi.org/10.1186/s13690-016-0155-7

Bors, P., Dessauer, M., Bell, R., Wilkerson, R., Lee, J., & Strunk, S. L. (2009). The Active Living by Design national program: community initiatives and lessons learned. *American Journal of Preventive Medicine, 37*(6), S313-S321. Retrieved from doi: https://doi.org/10.1016/j.amepre.2009.09.027

Boyle, M. H., Racine, Y., Georgiades, K., Snelling, D., Hong, S., Omariba, W., . . . Rao-Melacini, P. (2006). The influence of economic development level, household wealth and maternal education on child health in the developing world. *Social Science & Medicine, 63*(8), 2242-2254. Retrieved from doi: https://doi.org/10.1016/j.socscimed.2006.04.034

Bringolf-Isler, B., Grize, L., Mäder, U., Ruch, N., Sennhauser, F. H., & Braun-Fahrländer, C. (2008). Personal and environmental factors associated with active commuting to school in Switzerland. *Preventive Medicine, 46*(1), 67-73. Retrieved from doi: https://doi.org/10.1016/j.ypmed.2007.06.015

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist, 32*(7), 513-531. Retrieved from doi: http://dx.doi.org/10.1037/0003-066X.32.7.513

Brown, B., Mackett, R., Gong, Y., Kitazawa, K., & Paskins, J. (2008). Gender differences in children's pathways to independent mobility. *Children's Geographies, 6*(4), 385-401. Retrieved from doi: https://doi.org/10.1080/14733280802338080

Buehler, R., Pucher, J., Merom, D., & Bauman, A. (2011). Active travel in Germany and the US: contributions of daily walking and cycling to physical activity. *American Journal of Preventive Medicine, 41*(3), 241-250. Retrieved from doi: https://doi.org/10.1016/j.amepre.2011.04.012

Buliung, R. N., Mitra, R., & Faulkner, G. (2009). Active school transportation in the Greater Toronto Area, Canada: an exploration of trends in space and time (1986–2006). *Preventive Medicine, 48*(6), 507-512. Retrieved from doi: https://doi.org/10.1016/j.ypmed.2009.03.001

Bursac, Z., Gauss, C. H., Williams, D. K., & Hosmer, D. W. (2008). Purposeful selection of variables in logistic regression. *Source Code for Biology and Medicine, 3*(17). Retrieved from doi: https://doi.org/10.1186/1751-0473-3-17

Burton, J., Nandi, A., & Platt, L. (2010). Measuring ethnicity: challenges and opportunities for survey research. *Ethnic and Racial Studies, 33*(8), 1332-1349. Retrieved from doi: https://doi.org/10.1080/01419870903527801

Børrestad, L. A., Andersen, L. B., & Bere, E. (2011). Seasonal and socio-demographic determinants of school commuting. *Preventive Medicine, 52*(2), 133-135. Retrieved from doi: https://doi.org/10.1016/j.ypmed.2010.12.006

Caspersen, C. J., Powell, K. E., & Christenson, G. M. (1985). Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research. *Public Health Reports, 100*(2), 126-131. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1424733/pdf/pubhealthrep00100-0016.pdf

Chen, Y., & Li, H. (2009). Mother's education and child health: Is there a nurturing effect? *Journal of Health Economics, 28*(2), 413-426. Retrieved from doi: https://doi.org/10.1016/j.jhealeco.2008.10.005

Chillón et al. (2011). A systematic review of interventions for promoting active transportation to school. *International Journal of Behavioral Nutrition and Physical Activity, 8*(10). Retrieved from doi: https://doi.org/10.1186/1479-5868-8-10

Chillón, P., Martínez-Gómez, D., Ortega, F. B., Pérez-López, I. J., Díaz, L. E., Veses, A. M., . . . Delgado-Fernández, M. (2013). Six-year trend in active commuting to school in Spanish adolescents. *International Journal of Behavioral Medicine, 20*(4), 529-537. Retrieved from doi: https://doi.org/10.1007/s12529-012-9267-9

Cleland, V., Timperio, A., Salmon, J., Hume, C., Telford, A., & Crawford, D. (2011). A longitudinal study of the family physical activity environment and physical activity among youth. *American Journal of Health Promotion, 25*(3), 159-167. Retrieved from doi: https://doi.org/10.4278/ajhp.090303-QUAN-93

Colley, R. C., Carson, V., Garriguet, D., Janssen, I., Roberts, K. C., & Tremblay, M. S. (2017). Physical activity of Canadian children and youth, 2007 to 2015. *Health Reports, 28*(10), 8-16. Retrieved from https://www.researchgate.net/profile/Ian_Janssen/publication/322295083_Physical_activity_of_Canadian_children_and_youth_2007_to_2015/links/5a5f5ab7aca27273524361a5/Physical-activity-of-Canadian-children-and-youth-2007-to-2015.pdf

Committee on Environmental Health. (2009). The built environment: designing communities to promote physical activity in children. *Pediatrics, 123*(6), 1591-1598. Retrived from https://pediatrics.aappublications.org/content/pediatrics/123/6/1591.full.pdf

Cooper, A. R., Andersen, L. B., Wedderkopp, N., Page, A. S., & Froberg, K. (2005). Physical activity levels of children who walk, cycle, or are driven to school. *American Journal of Preventive Medicine, 29*(3), 179-184. Retrieved from doi: https://doi.org/10.1016/j.amepre.2005.05.009

Cooper, A. R., Page, A. S., Foster, L. J., & Qahwaji, D. (2003). Commuting to school: are children who walk more physically active? *American Journal of Preventive Medicine, 25*(4), 273-276. Retrieved from doi: https://doi.org/10.1016/S0749-3797(03)00205-8

Cooper, A. R., Wedderkopp, N., Wang, H., Andersen, L. B., Froberg, K., & Page, A. S. (2006). Active travel to school and cardiovascular fitness in Danish children and adolescents. *Medicine & Science in Sports & Exercise, 38*(10), 1724-1731. Retrieved from doi: http://doi.org/10.1249/01.mss.0000229570.02037.1d

D'Haese et al. (2011). Criterion distances and environmental correlates of active commuting to school in children. *International Journal of Behavioral Nutrition and Physical Activity, 8*(88). Retrieved from doi: https://doi.org/10.1186/1479-5868-8-88

D'Haese et al. (2014). The association between objective walkability, neighborhood socio-economic status, and physical activity in Belgian children. *International Journal of Behavioral Nutrition and Physical Activity, 11*(104). Retrieved from doi: https://doi.org/10.1186/s12966-014-0104-1

Dahlgren, G., & Whitehead, M. (1991). *Policies and strategies to promote social equity in health*. Retrieved from https://www.researchgate.net/profile/Goeran_Dahlgren/publication/5095964_Policies_and_strategies_to_promote_social_equity_in_health_Background_document_to_WHO_-_Strategy_paper_for_Europe/links/569540f808aeab58a9a4d946.pdf

Dalene, K. E., Anderssen, S. A., Andersen, L. B., Steene-Johannessen, J., Ekelund, U., Hansen, B. H., & Kolle, E. (2018). Cross-sectional and prospective associations between sleep, screen time, active school travel, sports/exercise participation and physical activity in children and adolescents. *BMC Public Health, 18*(705). Retrieved from doi: https://doi.org/10.1186/s12889-018-5610-7

Davison, K. K., Werder, J. L., & Lawson, C. T. (2008). Peer reviewed: Children's active commuting to school: Current knowledge and future directions. *Preventing Chronic Disease, 5*(3). Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2483568/pdf/PCD53A100.pdf

de Munter et al. (2012). The association of leisure-time physical activity and active commuting with measures of socioeconomic position in a multiethnic population living in the Netherlands: results from the cross-sectional SUNSET study. *BMC Public Health, 12*(815). Retrieved from doi: https://doi.org/10.1186/1471-2458-12-815

Deng, W. H., & Fredriksen, P. M. (2018). Objectively assessed moderate-to-vigorous physical activity levels among primary school children in Norway: The Health Oriented Pedagogical Project (HOPP). *Scandinavian Journal of Public Health, 46*(21_suppl), 38-47. Retrieved from doi: https://doi.org/10.1177/1403494818771207

Desai, S., & Alva, S. (1998). Maternal education and child health: Is there a strong causal relationship? *Demography, 35*(1), 71-81. Retrived from https://link.springer.com/content/pdf/10.2307%2F3004028.pdf

Drake, K. M., Beach, M. L., Longacre, M. R., Mackenzie, T., Titus, L. J., Rundle, A. G., & Dalton, M. A. (2012). Influence of sports, physical education, and active commuting to school on adolescent weight status. *Pediatrics, 130*(2), e296-e304. Retrieved from doi: http://doi.org/10.1542/peds.2011-2898

Ducheyne et al. (2012). Individual, social and physical environmental correlates of 'never' and 'always' cycling to school among 10 to 12 year old children living within a 3.0 km distance from school. *International Journal of Behavioral Nutrition and Physical Activity, 9*(142). Retrieved from doi: https://doi.org/10.1186/1479-5868-9-142

Dumith, S. C., Gigante, D. P., Domingues, M. R., & Kohl III, H. W. (2011). Physical activity change during adolescence: a systematic review and a pooled analysis. *International Journal of Epidemiology, 40*(3), 685-698. Retrieved from doi: https://doi.org/10.1093/ije/dyq272

Duncan, S., White, K., Mavoa, S., Stewart, T., Hinckson, E., & Schofield, G. (2016). Active transport, physical activity, and distance between home and school in children and adolescents. *Journal of Physical Activity and Health, 13*(4), 447-453. Retrieved from doi: https://doi.org/10.1123/jpah.2015-0054

e-Source. (n.d). Social and Behavioral Theories. Retrieved from http://www.esourceresearch.org/Default.aspx?TabId=736

Eime et al. (2013). A systematic review of the psychological and social benefits of participation in sport for children and adolescents: informing development of a conceptual model of health through sport. *International Journal of Behavioral Nutrition and Physical Activity, 10*(98). Retrieved from doi: https://doi.org/10.1186/1479-5868-10-98

Elstad, J. I. (2005). *Sosioøkonomiske ulikheter i helse : teorier og forklaringer*. (IS-1282). Retrieved from https://helsedirektoratet.no/Lists/Publikasjoner/Attachments/318/Sosiookonomiske-ulikheter-i-helse-teorier-og-forklaringer-IS-1282.pdf

Engbers, & Hendriksen. (2010). Characteristics of a population of commuter cyclists in the Netherlands: perceived barriers and facilitators in the personal, social and physical environment. *International Journal of Behavioral Nutrition and Physical Activity, 7*(89). Retrieved from doi: https://doi.org/10.1186/1479-5868-7-89

Evenson, K. R., Huston, S. L., McMillen, B. J., Bors, P., & Ward, D. S. (2003). Statewide Prevalence and Correlates of Walking and Bicycling to School. *Archives Pediatrics Adolescent Medicine, 157*(9), 887-892. Retrieved from doi: http://dor.org/10.1001/archpedi.157.9.887

Evenson, K. R., Neelon, B., Ball, S. C., Vaughn, A., & Ward, D. S. (2008). Validity and reliability of a school travel survey. *Journal of Physical Activity and Health, 5*(Supp 1), S1-S15. Retrieved from doi: https://doi.org/10.1123/jpah.5.s1.s1

Falconer, C. L., Leary, S. D., Page, A. S., & Cooper, A. R. (2015). The tracking of active travel and its relationship with body composition in UK adolescents. *Journal of Transport & Health, 2*(4), 483-489. Retrieved from doi: https://doi.org/10.1016/j.jth.2015.09.005

Field, A. (2014). *Discovrering statistics using ibm spss statistics* (4th ed. ed.): SAGE Publications.

Foley, L., Panter, J., Heinen, E., Prins, R., & Ogilvie, D. (2015). Changes in active commuting and changes in physical activity in adults: a cohort study. *International Journal of Behavioral Nutrition and Physical Activity, 12*(161). Retrieved from doi: https://doi.org/10.1186/s12966-015-0323-0

Friestad, C., & Klepp, K.-I. (2006). Socioeconomic status and health behaviour patterns through adolescence: Results from a prospective cohort study in Norway. *The European Journal of Public Health, 16*(1), 41-47. Retrieved from doi: https://doi.org/10.1093/eurpub/cki051

Fyhri, A., Hjorthol, R., Mackett, R. L., Fotel, T. N., & Kyttä, M. (2011). Children's active travel and independent mobility in four countries: Development, social contributing trends and measures. *Transport Policy, 18*(5), 703-710. Retrieved from doi: https://doi.org/10.1016/j.tranpol.2011.01.005

Galobardes, B., Shaw, M., Lawlor, D., & et al. (2006). Indicators of socioeconomic position (part 1). *Journal of Epidemiology & Community Health, 60*, 7-12. Retrieved from doi: http://dx.doi.org/10.1136/jech.2004.023531

Gao, M., Ahern, J., & Koshland, C. P. (2016). Perceived built environment and health-related quality of life in four types of neighborhoods in Xi'an, China. *Health & Place, 39*, 110-115. Retrieved from doi: https://doi.org/10.1016/j.healthplace.2016.03.008

Garnham-Lee, K. P., Falconer, C. L., Sherar, L. B., & Taylor, I. M. (2016). Evidence of moderation effects in predicting active transport to school. *Journal of Public Health, 39*(1), 153-162. Retrieved from doi: https://doi.org/10.1093/pubmed/fdw016

Gill, D. L., Hammond, C. C., Reifsteck, E. J., Jehu, C. M., Williams, R. A., Adams, M. M., . . . Shang, Y.-T. (2013). Physical activity and quality of life. *Journal of Preventive Medicine and Public Health, 46*(Suppl 1), S28. Retrieved from doi: http://doi.org/10.3961/jpmph.2013.46.S.S28

Golden, S., & Earp, J. (2012). Social ecological approaches to individuals and their contexts: twenty years of health education & behavior health promotion interventions. *Health Education & Behavior, 39*(3), 364-372. Retrieved from doi: https://doi.org/10.1177/1090198111418634

Grize et al. (2010). Trend in active transportation to school among Swiss school children and its associated factors: three cross-sectional surveys 1994, 2000 and 2005. *International Journal of Behavioral Nutrition and Physical Activity, 7*(28). Retrieved from doi: https://doi.org/10.1186/1479-5868-7-28

Gubbels, J. S., Kremers, S. P. J., Droomers, M., Hoefnagels, C., Stronks, K., Hosman, C., & de Vries, S. (2016). The impact of greenery on physical activity and mental health of adolescent and adult residents of deprived neighborhoods: A longitudinal study. *Health & Place, 40*, 153-160. Retrieved from doi: https://doi.org/10.1016/j.healthplace.2016.06.002

Hartig, T., Mitchell, R., Vries, S. d., & Frumkin, H. (2014). Nature and Health. *Annual Review of Public Health, 35*, 207-228. Retrieved from doi: https://doi.org/10.1146/annurev-publhealth-032013-182443

Hills, A. P., Andersen, L. B., & Byrne, N. M. (2011). Physical activity and obesity in children. *British Journal of Sports Medicine, 45*, 866-870. Retrieved from doi: http://doi.org/10.1136/bjsports-2011-090199

Hnatiuk, J. A., Ridgers, N. D., Salmon, J., & Hesketh, K. D. (2017). Maternal correlates of young children's physical activity across periods of the day. *Journal of Science and Medicine in Sport, 20*(2), 178-183. Retrieved from doi: https://doi.org/10.1016/j.jsams.2016.06.014

Hoelscher, D., Ory, M., Dowdy, D., Miao, J., Atteberry, H., Nichols, D., . . . Wang, S. (2016). Effects of funding allocation for safe routes to school programs on active commuting to school and related behavioral, knowledge, and psychosocial outcomes: results from the Texas childhood obesity prevention policy evaluation (T-COPPE) study. *Environment and Behavior, 48*(1), 210-229. Retrieved from doi: https://doi.org/10.1177/0013916515613541

Humphreys, B. R., McLeod, L., & Ruseski, J. E. (2014). Physical activity and health outcomes: evidence from Canada. *Health Economics, 23*(1), 33-54. Retrieved from doi: https://doi.org/10.1002/hec.2900

Janssen, & Leblanc. (2010). Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. *Intertaional Journal of Behavioral Nutrition and Physical Activity, 7*(40). Retrieved from doi: https://doi.org/10.1186/1479-5868-7-40

Johansson, K., Laflamme, L., & Hasselberg, M. (2011). Active commuting to and from school among Swedish children—a national and regional study. *The European Journal of Public Health, 22*(2), 209-214. Retrieved from doi: https://doi.org/10.1093/eurpub/ckr042

Jones, R. A., Hinkley, T., Okely, A. D., & Salmon, J. (2013). Tracking physical activity and sedentary behavior in childhood: a systematic review. *American Journal of Preventive Medicine, 44*(6), 651-658. Retrieved from doi: https://doi.org/10.1016/j.amepre.2013.03.001

Kaczynski, A. T., Bopp, M. J., & Wittman, P. (2012). To drive or not to drive: factors differentiating active versus non-active commuters. *Journal of Health Behavior and Public Health, 2*(2), 14-19. Retrieved from https://www.researchgate.net/publication/230681924_To_Drive_or_Not_to_Drive_Factors_Differentiating_Active_versus_Non-Active_Commuters

Kalil, A., Ryan, R., & Corey, M. (2012). Diverging destinies: Maternal education and the developmental gradient in time with children. *Demography, 49*(4), 1361-1383. Retrieved from doi: http://doi.org/10.1007/s13524-012-0129-5

Kalman, M., Inchley, J., Sigmundova, D., Iannotti, R. J., Tynjälä, J. A., Hamrik, Z., . . . Bucksch, J. (2015). Secular trends in moderate-to-vigorous physical activity in 32 countries from 2002 to 2010: a cross-national perspective. *European Journal of Public Health, 25*(suppl_2), 37-40. Retrieved from doi: https://doi.org/10.1093/eurpub/ckv024

Kerr, J., Rosenberg, D., Sallis, J. F., Saelens, B. E., Frank, L. D., & Conway, T. L. (2006). Active commuting to school: associations with environment and parental concerns. *Medicine & Science in Sports & Exercise, 38*(4), 787-793. Retrieved from doi: http://doi.org/10.1249/01.mss.0000210208.63565.73

Kolle, E., Steene-Johannessen, J., Andersen, L. B., & Anderssen, S. A. (2009). Seasonal variation in objectively assessed physical activity among children and adolescents in Norway: a cross-sectional study. *International Journal of Behavioral Nutrition and Physical Activity, 6*(36). Retrieved from doi: https://doi.org/10.1186/1479-5868-6-36

Kolle, E., Steene-Johannessen, J., Andersen, L., & Anderssen, S. (2010). Objectively assessed physical activity and aerobic fitness in a population-based sample of Norwegian 9-and 15-year-olds. *Scandinavian Journal of Medicine & Science in Sports, 20*(1), e41-e47. Retrieved from doi: https://doi.org/10.1111/j.1600-0838.2009.00892.x

Kopperstad, Ø., Skogen, J., Sivertsen, B., Tell, G., & Sæther, S. (2017). Physical activity is independently associated with reduced mortality: 15-years follow-up of the Hordaland Health Study (HUSK). *PLoS One, 12*(3), e0172932. Retrieved from doi: https://doi.org/10.1371/journal.pone.0172932

Kristensen, P., Korsholm, L., Møller, N., Wedderkopp, N., Andersen, L., & Froberg, K. (2008). Sources of variation in habitual physical activity of children and adolescents: the European youth heart study. *Scandinavian Journal of Medicine & Science in Sports, 18*(3), 298-308. Retrieved from doi: https://doi.org/10.1111/j.1600-0838.2007.00668.x

Lakerveld, J., & Mackenbach, J. (2017). The Upstream Determinants of Adult Obesity. *Obesity Facts, 10*(3), 216-222. Retrived from doi: http://doi.org/10.1159/000471489

Langlois, J., Omorou, A. Y., Vuillemin, A., Briançon, S., Lecomte, E., & PRALIMAP Trial Group. (2017). Association of socioeconomic, school-related and family factors and physical activity and sedentary behaviour among adolescents: multilevel analysis of the PRALIMAP trial inclusion data. *BMC Public Health, 17*(175). Retrieved from doi: https://doi.org/10.1186/s12889-017-4070-9

Larouche, R., Eryuzlu, S., Livock, H., Leduc, G., Faulkner, G., Trudeau, F., & Tremblay, M. S. (2017). Test-retest reliability and convergent validity of measures of children's travel behaviours and independent mobility. *Journal of Transport and Health, 6*, 105-118. Retrieved from doi: https://doi.org/10.1016/j.jth.2017.05.360

Lebo, M. J., & Weber, C. (2015). An effective appraoach to the repeated cross-sectional design. *American Journal of Political Science, 59*(1), 242-258. Retrieved from doi: https://doi.org/10.1111/ajps.12095

Levin, K. A. (2006). Study design III: Cross-sectional studies. *Evidence-based dentistry, 7*, 24-25. Retrieved from doi: http://doi.org7:10.1038/sj.ebd.6400375

Lindeboom, M., Llena-Nozal, A., & van Der Klaauw, B. (2009). Parental education and child health: Evidence from a schooling reform. *Journal of Health Economics, 28*(1), 109-131. Retrieved from doi: https://doi.org/10.1016/j.jhealeco.2008.08.003

Loucaides, C. A., Jago, R., & Theophanous, M. (2010). Prevalence and correlates of active traveling to school among adolescents in Cyprus. *Central European Journal of Public Health, 18*(3), 151-156. Retrieved from doi: http://doi.org/10.21101/cejph.a3592

Lu, W., McKyer, E. L. J., Lee, C., Ory, M. G., Goodson, P., & Wang, S. (2015). Children's active commuting to school: an interplay of self-efficacy, social economic

disadvantage, and environmental characteristics. *International Journal of Behavioral Nutrition and Physical Activity, 12*(29). Retrieved from doi: https://doi.org/10.1186/s12966-015-0190-8

Lubans, D., Richards, J., Hillman, C., Faulkner, G., Beauchamp, M., Nilsson, M., . . . Biddle, S. (2016). Physical activity for cognitive and mental health in youth: a systematic review of mechanisms. *Pediatrics, 138*(3), e20161642. Retrieved from doi: http://doi.org/10.1542/peds.2016-1642

Lubans et al. (2011). The relationship between active travel to school and health-related fitness in children and adolescents: a systematic review. *International Journal of Behavioral Nutrition and Physical Activity, 8*(5). Retrieved from doi: https://doi.org/10.1186/1479-5868-8-5

Martin, S. L., Lee, S. M., & Lowry, R. (2007). National prevalence and correlates of walking and bicycling to school. *American Journal of Preventive Medicine, 33*(2), 98-105. Retrieved from doi: https://doi.org/10.1016/j.amepre.2007.04.024

McDonald, N. C. (2007). Active transportation to school: trends among US schoolchildren, 1969–2001. *American Journal of Preventive Medicine, 32*(6), 509-516. Retrieved from doi: https://doi.org/10.1016/j.amepre.2007.02.022

McDonald, N. C. (2012). Is there a gender gap in school travel? An examination of US children and adolescents. *Journal of Transport Geography, 20*(1), 80-86. Retrieved from doi: https://doi.org/10.1016/j.jtrangeo.2011.07.005

McMillan, T. E. (2005). Urban form and a child's trip to school: the current literature and a framework for future research. *Journal of Planning Literature, 19*(4), 440-456. Retrieved from doi: https://doi.org/10.1177/0885412204274173

Mendoza et al. (2010). Validity of instruments to assess students' travel and pedestrian safety. *BMC Public Health, 10*(257). Retrieved from doi: https://doi.org/10.1186/1471-2458-10-257

Mendoza, J. A., Watson, K., Baranowski, T., Nicklas, T. A., Uscanga, D. K., Nguyen, N., & Hanfling, M. J. (2010). Ethnic minority children's active commuting to school and association with physical activity and pedestrian safety behaviors. *The Journal of Applied Research on Children: Informing Policy for Children At Risk, 1*(1), 1-23. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3160673/pdf/nihms300760.pdf

Ministry of Health and Care Services. (2013). Fysisk aktivitet .Retrived from https://www.regjeringen.no/no/tema/helse-og-omsorg/folkehelse/fysisk-aktivitet/id589909/

Ministry of Health and Care Services. (2019). *Folkehelsemeldinga - Gode liv i eit trygt samfunn* (Meld. St. nr.19 (2018-2019)). Retrieved from https://www.regjeringen.no/contentassets/84138eb559e94660bb84158f2e62a77d/nn-no/pdfs/stm201820190019000dddpdfs.pdfhttps://www.regjeringen.no/contentassets/84138eb559e94660bb84158f2e62a77d/nn-no/pdfs/stm201820190019000dddpdfs.pdf.

Mota, J., Gomes, H., Almeida, M., Ribeiro, J. C., Carvalho, J., & Santos, M. P. (2007). Active versus passive transportation to school–differences in screen time, socio-economic position and perceived environmental characteristics in adolescent girls. *Annals of hHuman Biology, 34*(3), 273-282. Retrieved from doi: https://doi.org/10.1080/03014460701308615

Nelson, N. M., Foley, E., O'gorman, D. J., Moyna, N. M., & Woods, C. B. (2008). Active commuting to school: how far is too far? *International Journal of Behavioral Nutrition and Physical Activity, 5*(1). Retrieved from doi: https://doi.org/10.1186/1479-5868-5-1

Nelson, N. M., & Woods, C. B. (2010). Neighborhood perceptions and active commuting to school among adolescent boys and girls. *Journal of Physical Activity and Health, 7*(2), 257-266. Retrieved from doi: https://doi.org/10.1123/jpah.7.2.257

Nordic Co-operation. (2014). *Nordic Nutrition Recommendations 2012: Integrating nutrition and physical activity.* Retrived from http://norden.diva-portal.org/smash/get/diva2:704251/FULLTEXT01.pdf

Pabayo, R., Maximova, K., Spence, J. C., Vander Ploeg, K., Wu, B., & Veugelers, P. J. (2012). The importance of Active Transportation to and from school for daily physical activity among children. *Preventive Medicine, 55*(3), 196-200. Retrieved from doi: https://doi.org/10.1016/j.ypmed.2012.06.008

Page et al. (2010). Independent mobility, perceptions of the built environment and children's participation in play, active travel and structured exercise and sport: the PEACH Project. *International Journal of Behavioral Nutrition and Physical Activity, 7*(17). Retrieved from doi: https://doi.org/10.1186/1479-5868-7-17

Panter et al. (2013). Individual, socio-cultural and environmental predictors of uptake and maintenance of active commuting in children: longitudinal results from the SPEEDY study. *International Journal of Behavioral Nutrition and Physical Activity, 10*(83). Retrieved from doi: https://doi.org/10.1186/1479-5868-10-83

Panter, J., Jones, A., Van Sluijs, E., & et al. (2010). Attitudes, social support and environmental perceptions as predictors of active commuting behaviour in school children. *Journal of Epidemiology & Community Health, 64*, 41-48. Retrieved from doi: http://doi.org/10.1136/jech.2009.086918

Panter, J. R., Jones, A. P., Van Sluijs, E. M., & Griffin, S. J. (2010). Neighborhood, route, and school environments and children's active commuting. *American Journal of Preventive Medicine, 38*(3), 268-278. Retrieved from doi: https://doi.org/10.1016/j.amepre.2009.10.040

Peng, C.-Y. J., Lee, K. L., & Ingersoll, G. M. (2002). An introduction to logistic regression analysis and reporting. *The Journal of Educational Research, 96*(1), 3-14. Retrieved from doi: https://doi.org/10.1080/00220670209598786

Poitras, V. J., Gray, C. E., Borghese, M. M., Carson, V., Chaput, J.-P., Janssen, I., . . . Kho, M. E. (2016). Systematic review of the relationships between objectively measured physical activity and health indicators in school-aged children and youth. *Applied*

Physiology, Nutrition, and Metabolism, 41(6), S197-S239. Retrieved from doi: https://doi.org/10.1139/apnm-2015-0663

Polit, D. F., & Beck, C. T. (2018). *Essentials of nursing research : appraising evidence for nursing practice* (9th Ed. 9th ed. ed.). Philadelphia, Pa: Wolters Kluwer.

Pont, K., Ziviani, J., Wadley, D., Bennett, S., & Abbott, R. (2009). Environmental correlates of children's active transportation: a systematic literature review. *Health & Place, 15*(3), 849-862. Retrieved from doi: https://doi.org/10.1016/j.healthplace.2009.02.002

Rafferty, A., Walthery, P., & King-Hele, S. (2015). Analysing Change Over Time: repeated crosssectional and longitudinal survey data. *UK Data Service, University of Essex and University of Manchester*. Retrived from https://www.ukdataservice.ac.uk/media/455362/changeovertime.pdf

Riddoch, C. J., Mattocks, C., Deere, K., Saunders, J., Kirkby, J., Tilling, K., . . . Ness, A. R. (2007). Objective measurement of levels and patterns of physical activity. *Archives of Disease in Childhood, 92*, 963-969. Retrieved from doi: https://doi.org/10.1136/adc.2006.112136

Rojas Lopez, M. C., & Wong, Y. D. (2017). Children's active trips to school: a review and analysis. *International Journal of Urban Sustainable Development, 9*(1), 79-95. Retrieved from doi: https://doi.org/10.1080/19463138.2016.1264405

Rutter, H. R., Bes-Rastrollo, M., de Henauw, S., Lahti-Koski, M., Lehtinen-Jacks, S., Mullerova, D., . . . Lissner, L. (2017). Balancing Upstream and Downstream Measures to Tackle the Obesity Epidemic: A Position Statement from the European Association for the Study of Obesity. *Obesity Facts, 10*(1), 61-63. Retrieved from doi: https://doi.org/10.1159/000455960

Ryan, G., & Dzewaltowski, D. (2002). Comparing the relationships between different types of self-efficacy and physical activity in youth. *Health Education & Behavior, 29*(4), 491-504. Retrieved from doi: https://doi.org/10.1177/109019810202900408

Sahlqvist et al. (2013). Change in active travel and changes in recreational and total physical activity in adults: longitudinal findings from the iConnect study. *International Journal of Behavioral Nutrition and Physical Activity, 10*(28). Retrieved from doi: https://doi.org/10.1186/1479-5868-10-28

Sahlqvist, S., Song, Y., & Ogilvie, D. (2012). Is active travel associated with greater physical activity? The contribution of commuting and non-commuting active travel to total physical activity in adults. *Preventive Medicine, 55*(3), 206-211. Retrieved from doi: https://doi.org/10.1016/j.ypmed.2012.06.028

Sallis, J. F., Cerin, E., Conway, T. L., Adams, M. A., Frank, L. D., Pratt, M., . . . Owen, N. (2016). Physical activity in relation to urban environments in 14 cities worldwide: a cross-sectional study. *The Lancet, 387*(10034), 2207-2217. Retrieved from doi: https://doi.org/10.1016/S0140-6736(15)01284-2

Sallis, J. F., & Owen, N. (2015). Ecological Models Of Health Behavior. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), *Health behavior: Theory, research, and practice* (Fifth edition. ed., pp. 43-64). San Francisco, CA: United States: Jossey Bass Ltd.

Salmon, J., Salmon, L., Crawford, D., Hume, C., & Timperio, A. (2007). Associations among individual, social, and environmental barriers and children's walking or cycling to school. *American Journal of Health Promotion, 22*(2), 107-113. Retrieved from doi: https://doi.org/10.4278/0890-1171-22.2.107

Schlossberg, M., Greene, J., Phillips, P. P., Johnson, B., & Parker, B. (2006). School Trips: Rffects of Urban Form and Distance on Travel Mode. *Journal of the American Planning Association, 72*(3), 337-346. Retrieved from doi: https://doi.org/10.1080/01944360608976755

Shephard, R. J. (2003). Limits to the measurement of habitual physical activity by questionnaires. *British Journal of Sports Medicine, 37*(3), 197-206. Retrieved from doi: http://dx.doi.org/10.1136/bjsm.37.3.197

Shi, Z., Lien, N., Kumar, B. N., & Holmboe-Ottesen, G. (2006). Physical activity and associated socio-demographic factors among school adolescents in Jiangsu Province, China. *Preventive Medicine, 43*(3), 218-221. Retrieved from doi: https://doi.org/10.1016/j.ypmed.2006.04.017

Sigmund, E., Turonová, K., Sigmundová, D., & Přidalová, M. (2008). The effect of parents´physical activity and inactivity on their children´s physical activity and sitting. *Acta Universitatis Palackianae Olomucensis. Gymnica, 38*(4), 17-24. Retrieved from https://www.researchgate.net/profile/Miroslava_Pidalova/publication/266219854_The_effect_of_parents'_physical_activity_and_inactivity_on_their_childrens'_physical_activity_and_sitting/links/54cf7fe10cf24601c0938ace/The-effect-of-parents-physical-activity-and-inactivity-on-their-childrens-physical-activity-and-sitting.pdf

Sirard, J. R., McDonald, K., Mustain, P., Hogan, W., & Helm, A. (2015). Effect of a school choice policy change on active commuting to elementary school. *American Journal of Health Promotion, 30*(1), 28-35. Retrieved from doi: https://doi.org/10.4278/ajhp.130510-QUAN-236

Sirard, J. R., Riner, J. W., McIver, K. L., & Pate, R. R. (2005). Physical activity and active commuting to elementary school. *Medicine and Science in Sports and Exercise, 37*(12), 2062-2069. Retrieved from doi: https://doi.org/10.1249/01.mss.0000179102.17183.6b

Sirard, J. R., & Slater, M. E. (2008). Walking and bicycling to school: a review. *American Journal of Lifestyle Medicine, 2*(5), 372-396. Retrieved from doi: https://doi.org/10.1177/1559827608320127

Sirin, S. R. (2005). Socioeconomic status and academic achievement: A meta-analytic review of research. *Review of Educational Research, 75*(3), 417-453. Retrieved from doi: https://doi.org/10.3102/00346543075003417

Smith et al. (2010). Parental influences on child physical activity and screen viewing time: a population based study. *BMC Public Health, 10*(593). Retrieved from doi: https://doi.org/10.1186/1471-2458-10-593

Smith, J. J., Eather, N., Morgan, P. J., Plotnikoff, R. C., Faigenbaum, A. D., & Lubans, D. R. (2014). The health benefits of muscular fitness for children and adolescents: a

systematic review and meta-analysis. *Sports Medicine, 44*(9), 1209-1223. Retrieved from doi: https://doi.org/10.1007/s40279-014-0196-4

Southward, E. F., Page, A. S., Wheeler, B. W., & Cooper, A. R. (2012). Contribution of the school journey to daily physical activity in children aged 11–12 years. *American Journal of Preventive Medicine, 43*(2), 201-204. Retrieved from doi: https://doi.org/10.1016/j.amepre.2012.04.015

Stalsberg, R., & Pedersen, A. V. (2010). Effects of socioeconomic status on the physical activity in adolescents: a systematic review of the evidence. *Scandinavian Journal of Medicine Science in Sports, 20*, 368-383. Retrieved from doi: https://doi.org/10.1111/j.1600-0838.2009.01047.x

Stappers, N., Van Kann, D., Ettema, D., De Vries, N., & Kremers, S. (2018). The effect of infrastructural changes in the built environment on physical activity, active transportation and sedentary behavior–A systematic review. *Health & Place, 53*, 135-149. Retrived from doi: https://doi.org/10.1016/j.healthplace.2018.08.002

State Highways Authority. (2007). Active school road. Retrieved from https://www.vegvesen.no/fag/fokusomrader/Miljovennlig+transport/Barn+og+ungdom/Aktiv+skoleveg

Statistics Norway. (2018). Educational attainment of the population. Retrieved from https://www.ssb.no/en/utdanning/statistikker/utniv

Stewart, O. (2011). Findings from research on active transportation to school and implications for safe routes to school programs. *Journal of Planning Literature, 26*(2), 127-150. Retrieved from doi: https://doi.org/10.1177/0885412210385911

Steyerberg, E. W., Harrell Jr, F. E., Borsboom, G. J., Eijkemans, M., Vergouwe, Y., & Habbema, J. D. F. (2001). Internal validation of predictive models: efficiency of some procedures for logistic regression analysis. *Journal of Clinical Epidemiology, 54*(8), 774-781. Retrieved from doi: https://doi.org/10.1016/S0895-4356(01)00341-9

Stokols, D. (1996). Translating social ecological theory into guidelines for community health promotion. *American Journal of Health Promotion, 10*(4), 282-298. Retrieved from doi: https://doi.org/10.4278/0890-1171-10.4.282

Strong, W. B., Malina, R. M., Blimkie, C. J., Daniels, S. R., Dishman, R. K., Gutin, B., . . . Pivarnik, J. M. (2005). Evidence based physical activity for school-age youth. *The Journal of Pediatrics, 146*(6), 732-737. Retrieved from doi: https://doi.org/10.1016/j.jpeds.2005.01.055

Svardal, F. (04.06.2018). Sosial læringsteori. Retrieved from https://snl.no/sosial_læringsteori

Tammelin, R., Yang, X., Leskinen, E., Kankaanpaa, A., Hirvensalo, M., Tammelin, T., & Raitakari, O. (2014). Tracking of physical activity from early childhood through youth into adulthood. *Medicine & Science in Sports & Exercise, 46*(5). Retrieved from doi: http://doi.org/10.1249/MSS.0000000000000181

Taylor, W. C., Sallis, J. F., Lees, E., Hepworth, J. T., Feliz, K., Volding, D. C., . . . Tobin, J. N. (2007). Changing social and built environments to promote physical activity:

recommendations from low income, urban women. *Journal of Physical Activity and Health, 4*(1), 54-65. https://doi.org/10.1123/jpah.4.1.54

Telama, R. (2009). Tracking of physical activity from childhood to adulthood: a review. *Obesity Facts, 2*(3), 187-195. Retrieved from doi: https://doi.org/10.1159/000222244

Telama, R., Yang, X., Viikari, J., Välimäki, I., Wanne, O., & Raitakari, O. (2005). Physical activity from childhood to adulthood: a 21-year tracking study. *American Journal of Preventive Medicine, 28*(3), 267-273. Retrieved from doi: https://doi.org/10.1016/j.amepre.2004.12.003

Tetali, S., Edwards, P., Murthy, G. V. S., & Roberts, I. (2015). Development and validation of a self-administered questionnaire to estimate the distance and mode of children's travel to school in urban India. *BMC Medical Research Methodology, 15*(92). Retrieved from doi: https://doi.org/10.1186/s12874-015-0086-y

The Norwegian Directorate of Health. (2003). *Prescription for Healthier Norway; A broad policy for public health*. (Meld. St. nr.16 2002-2003). Retrieved from https://www.regjeringen.no/contentassets/069d160b7cf54b04a1a375515d01659a/no/pdfs/stm200220030016000dddpdfs.pdf

The Norwegian Direction of Health. (2013). *Public Health Message: Good health - collective responsibility* (Meld.St.34 (2012-2013)). Retrieved from https://www.regjeringen.no/contentassets/ce1343f7c56f4e74ab2f631885f9e22e/no/pdfs/stm201220130034000dddpdfs.pdf

The Norwegian Directorate of Health. (2016a). Recommendations for physical activity. Retrieved from https://helsedirektoratet.no/folkehelse/fysisk-aktivitet/anbefalinger-fysisk-aktivitet

The Norwegian Directorate of Health. (2016b). Strategies and measures to increase physical activity in society. Retrieved from https://helsedirektoratet.no/folkehelse/fysisk-aktivitet/strategier-og-tiltak-for-a-oke-fysisk-aktivitet-i-samfunnet

The Norwegian Institute of Public Health. (2018). Ny handlingsplan skal få folk opp av sofaen Retrieved from https://www.fhi.no/nyheter/2018/ny-handlingsplan-skal-fa-folk-opp-av-sofaen/

The Norwegian Ministry of Transport and Communications. (2017). *National Transport Plan 2018-2029* (Meld. St. 33 2016-2017). Retrieved from https://www.regjeringen.no/contentassets/7c52fd2938ca42209e4286fe86bb28bd/en-gb/pdfs/stm201620170033000engpdfs.pdf

Timperio, A., Ball, K., Salmon, J., Roberts, R., Giles-Corti, B., Simmons, D., . . . Crawford, D. (2006). Personal, family, social, and environmental correlates of active commuting to school. *American Journal of Preventive Medicine, 30*(1), 45-51. Retrieved from doi: https://doi.org/10.1016/j.amepre.2005.08.047

Timperio, A., Salmon, J., Telford, A., & Crawford, D. (2005). Perceptions of local neighbourhood environments and their relationship to childhood overweight and obesity. *International Journal of Obesity, 29*, 170-175. Retrieved from doi: http://doi.org/10.1038/sj.ijo.0802865

Torsheim, T., Currie, C., Boyce, W., Kalnins, I., Overpeck, M., & Haugland, S. (2004). Material deprivation and self-rated health: a multilevel study of adolescents from 22 European and North American countries. *Social Science & Medicine, 59*, 1-12. Retrieved from doi: https://doi.org/10.1016/j.socscimed.2003.09.032

Tudor-Locke, C., Ainsworth, B. E., Adair, L. S., & Popkin, B. M. (2003). Objective physical activity of Filipino youth stratified for commuting mode to school. *Medicine & Science in Sports & Exercise, 35*(3), 465-471. Retrieved from doi: http://doi.org/10.1249/01.MSS.0000053701.30307.A6

Twisk, J. W. (2001). Physical activity guidelines for children and adolescents. *Sports medicine, 31*(8), 617-627. Retrieved from https://link.springer.com/content/pdf/10.2165%2F00007256-200131080-00006.pdf

Van der Ploeg, H. P., Merom, D., Corpuz, G., & Bauman, A. E. (2008). Trends in Australian children traveling to school 1971–2003: Burning petrol or carbohydrates? *Preventive medicine, 46*(1), 60-62. Retrieved from doi: https://doi.org/10.1016/j.ypmed.2007.06.002

van der Zee, M. D., van der Mee, D., Bartels, M., & de Geus, E. J. (2019). Tracking of voluntary exercise behaviour over the lifespan. *International journal of behavioral nutrition and physical activity, 16*(17). Retrieved from doi: http://doi.org/10.1186/s12966-019-0779-4

van Sluijs, E. M., Fearne, V. A., Mattocks, C., Riddoch, C., Griffin, S. J., & Ness, A. (2009). The contribution of active travel to children's physical activity levels: Cross-sectional results from the ALSPAC study. *Preventive medicine, 48*(6), 519-524. Retrieved from doi: https://doi.org/10.1016/j.ypmed.2009.03.002

Veitch, J., Carver, A., Salmon, J., Abbott, G., Ball, K., Crawford, D., . . . Timperio, A. (2017). What predicts children's active transport and independent mobility in disadvantaged neighborhoods? *Health & place, 44*, 103-109. Retrieved from doi: https://doi.org/10.1016/j.healthplace.2017.02.003

Villa-González, E., Ruiz, J. R., Mendoza, J. A., & Chillón, P. (2017). Effects of a school-based intervention on active commuting to school and health-related fitness. *BMC Public Health, 17*(20). Retrieved from doi: https://doi.org/10.1186/s12889-016-3934-8

Wamani, H., Tylleskär, T., Åstrøm, A. N., Tumwine, J. K., & Peterson, S. (2004). Mothers' education but not fathers' education, household assets or land ownership is the best predictor of child health inequalities in rural Uganda. *International journal for equity in health, 3*(9). Retrieved from doi: https://doi.org/10.1186/1475-9276-3-9

Wen, L. M., Fry, D., Rissel, C., Dirkis, H., Balafas, A., & Merom, D. (2007). Factors associated with children being driven to school: implications for walk to school programs. *Health education research, 23*(2), 325-334. Retrieved from doi: https://doi.org/10.1093/her/cym043

Wilson, E. J., Marshall, J., Wilson, R., & Krizek, K. J. (2010). By foot, bus or car: children's school travel and school choice policy. *Environment and Planning A, 42*(9), 2168-2185. Retrieved from doi: https://doi.org/10.1068/a435

World Health Organization. (2010a). *Global recommendations on physical activity for health*. World Health Organization Retrieved from http://apps.who.int/iris/bitstream/handle/10665/44399/9789241599979_eng.pdf?sequence=1&isAllowed=y

World Health Organization. (2010b). *Global recommendations on physical activity for health*. Switzerland: World Health Organization, Retrieved from https://apps.who.int/iris/bitstream/handle/10665/44399/9789241599979_eng.pdf?sequence=1

World Health Organization. (2018). Physical Health. Retrieved from http://www.who.int/news-room/fact-sheets/detail/physical-activity

World Health Organization. (n.d). Constitution of WHO: principles. Retrieved from http://www.who.int/about/mission/en/

Zecevic, C. A., Tremblay, L., Lovsin, T., & Michel, L. (2010). Parental influence on young children's physical activity. *International journal of pediatrics, 2010*. Retrieved from doi: http://doi.org10.1155/2010/468526

Østergaard et al. (2013). Cross sectional analysis of the association between mode of school transportation and physical fitness in children and adolescents. *International journal of behavioral nutrition and physical activity, 10*(91). Retrieved from doi: https://doi.org/10.1186/1479-5868-10-91

Aarts, M.-J., Mathijssen, J. J. P., van Oers, J. A. M., & Schuit, A. J. (2013). Associations Between Environmental Characteristics and Active Commuting to School Among Children: a Cross-sectional Study. *International journal of behavioral medicine, 20*(4), 538-555. Retrieved from doi: http://doi.org/10.1007/s12529-012-9271-0

APPENDIXES

ETHICAL APPROVAL FROM THE NORWEGIAN SOCIAL SCIENCE DATA SERVICE (NSD)

ETHICAL APPROVAL FROM THE ETHICAL COMMITTEES AT THE FACULTY FOR PUBLIC HEALTH, SPORTS, AND NUTRITION FOR THE UNIVERSITY OF AGDER (FEK)

INFORMATINAL LETTER TO THE PARENTS ABOUT PARTICIPATION IN THE RESEARCH PROCJET FG6/ATN/(M)EAT 2018 ABOUT NUTRITION AND PHYSICAL ACTIVITY

CONSENT SHEET

PUPILS QUESTIONNAIRE FROM THE FG6/(M)EAT-STUDY 2018

PARENT QUESTIONNAIRE FROM THE FG6/(M)EAT -STUDY 2018

THE ARTICLE MANUSCRIPT

Universitetet i Agder
Att: Elling Bere
Elling.bere@uia.no

Vår dato: 21.08.2018 Vår ref:60714 MSS/LR Deres dato: Deres ref:

VURDERING AV BEHANDLING AV SÆRSKILTE KATEGORIER PERSONOPPLYSNINGER I PROSJEKTET: *EN SPØRREUNDERSØKELSE OM KOSTHOLD, FYSISK AKTIVITET OG MILJØ - FVMM/ATN 2018 SURVEY*

NSD - Norsk senter for forskningsdata AS viser til meldeskjema innsendt 09.05.2018. Meldingen gjelder behandling av personopplysninger til forskningsformål.

Etter avtale med den behandlingsansvarlige, Universitetet i Agder, har NSD foretatt en vurdering av om den planlagte behandlingen er i samsvar med personvernlovgivningen.

Resultat av NSDs vurdering:

NSD vurderer at det vil bli behandlet særskilte kategorier personopplysninger om helseforhold og etnisk bakgrunn frem til 31.12.2019.

NSDs vurdering er at behandlingen vil være i samsvar med personvernlovgivingen, og at lovlig grunnlag for behandlingen er samtykke.

Vår vurdering forutsetter at prosjektansvarlig behandler personopplysninger i tråd med:

- opplysninger gitt i meldeskjema og øvrig dokumentasjon
- dialog med NSD, og vår vurdering (se under)
- Universitetet i Agder sine retningslinjer for datasikkerhet, herunder regler om hvilke tekniske hjelpemidler det er tillatt å bruke
- Universitetet i Agder sine retningslinjer for bruk av databehandler.

Nærmere begrunnelse for NSDs vurdering:

1. Beskrivelse av den planlagte behandlingen av personopplysninger

FORMÅL
Formålet med dette prosjektet er å undersøke utviklingen i kosthold og fysisk aktivitet over tid. Universitetet i Agder gjennomførte en tilsvarende undersøkelse i 2001 og 2008. Dette gir unike data for å kunne evaluere den nasjonale ordningen med gratis skolefrukt som varte fra 2007 til 2014. I tillegg kan man i dette datamaterialet se på utviklingen over tid på sentrale kostparametere, transportvaner og holdninger til et bærekraftig kosthold. Dette sett opp mot

sosioøkonomisk status og kjønn. Det inkluderes nå også en undersøkelse på videregående skoler for å se på langtidseffekten av gratis skolefrukt..

UTVALG OG REKRUTTERING
Det rekrutteres tre utvalg i forbindelse med studien:
1) 6. og 7. klassinger ved 38 skoler i Hedmark og Telemark,
2) Elevenes foreldre
3) personer som bor i Hedmark og Telemark og er født i 2000/ 2001.

Totalt består utvalget av maksimalt 1300 barn, 8000 ungdom og 1000 foreldre/voksne. Undersøkelsen på 6. og 7. trinnet gjennomføres ved hjelp av papirskjema i skoletiden. Foreldre og barn rekrutteres via skolen.

Det har ikke lykkes prosjektleder å få gjennomført ungdomsundersøkelsen i skoletiden ved de videregående skolene og rekruttering vil derfor skje via Facebook. Det er ønskelig å innhente besvarelser på elektronisk spørreskjema fra 1000 ungdommer. Ved for lav svarprosent vil utvalget utvides til å også omfatte Agder-fylkene.

De 38 skolene i del 1 er skolene som i 2001 var med i prosjektet Fruits and Vegetables Make the Marks (FVMM, NSD prosjektnr. 12395). En rekrutterer ungdommer i Hedmark og Telemark født i 2000/2001 for å kunne sammenligne med FVMM data fra 2001 og 2008.

DATAMATERIALE
Det innhentes blant annet opplysninger om kosthold, aktivitet, transportvaner og holdninger til et bærekraftig kosthold, samt sosioøkonomisk status og kjønn. Det vil registreres navn på skole i forbindelse med undersøkelsen på 6. og 7. trinn.

METODE
Opplysningene innhentes gjennom papirbasert spørreskjema blant elever på 6. og 7. trinn. Papirskjema kodes for å kunne kobles mot foreldrenes besvarelse som gjennomføres elektronisk.

Spørreundersøkelse blant ungdommer gjennomføres elektronisk.

INFORMASJON OG SAMTYKKE
Barneskolene kontaktes først på e-post, så på telefon. Lærerne informerer elevene og foreldrene ved å levere ut informasjonsskriv med samtykkeerklæring.

Ungdommene rekrutteres og får informasjon via Facebook, samt i informasjonstekst innledningsvis i elektronisk spørreskjema.

BEHANDLINGENS VARIGHET
Ifølge e-post fra forsker, mottatt den 31.07.2018, og i tråd med informasjonen til de registrerte, vil opplysningene behandles frem til 31.12.2019. Innen 31.12.2019 skal personidentifiserbare opplysninger slettes fra datamaterialet, eller bearbeides på en slik måte at enkeltindivider ikke kan identifiseres.

2. Personvernprinsipper

NSDs vurdering er at behandlingen følger personvernprinsippene, ved at personopplysninger;

- skal behandles på en lovlig, rettferdig og åpen måte med hensyn til den registrerte (se punkt 3 og 4)

- skal samles inn for spesifikke, uttrykkelig angitte og berettigede formål og der personopplysningene ikke viderebehandles på en måte som er uforenelig med formålet (se punkt 1 og 3)
- vil være adekvate, relevante og begrenset til det som er nødvendig for formålet de behandles for (se punkt 6)
- skal lagres på en slik måte at det ikke er mulig å identifisere de registrerte lengre enn det som er nødvendig for formålet (se punkt 5 og 6)

3. Lovlig grunnlag for å behandle særskilte kategorier personopplysninger

Særskilte kategorier - Samtykke ((art. 6.1. a), art. 9.2 a)
Det fremgår av meldeskjema vi har fått tilsendt at det vil bli innhentet samtykke fra de registrerte. NSD vurderer at den planlagte behandlingen av personopplysninger er lovlig fordi:

- det skal innhentes uttrykkelig samtykke fra de registrerte og
- forsker har oppfylt den særskilte rådføringsplikten

Samtykke dokumenteres ved at det innhentes samtykkeerklæringer hvor foreldre til elever under 15 år har underskrevet. Samtykke fra elever ved videregående skole innhentes ved at den forespurte besvarer et elektronisk spørreskjema og at kobling mot IP loggføres.

4. De registrertes rettigheter

NSD vurderer at den registrerte har krav på å benytte seg av følgende rettigheter: informasjon, innsyn, retting og sletting av personopplysninger, begrensning, dataportabilitet, protest.

NSD finner at informasjonsskrivet stilet til elever og foreldre mottatt den 31.07.2018 vil gi de registrerte god informasjon om hva behandlingen innebærer og om hvilke rettigheter de har. Vi ber likevel om at det tydeliggjøres hvordan man går frem for å benytte seg av sine rettigheter, d.v.s. hvem man kontakter f.eks. dersom man ønsker å trekke seg fra studien og få opplysningene anonymisert. Vi foreslår at dette tilføyes avslutningsvis hvor det blant annet står «Dersom du har spørsmål eller andre henvendelser omkring prosjektet, vennligst ta kontakt med:...»

NSD finner at informasjonsskrivet stilet til ungdommene er noe mangelfullt, og ikke gir de registrerte god nok informasjon om hva behandlingen innebærer og om hvilke rettigheter de har. Vi forutsetter derfor at følgende endres/tilføyes før det gis til utvalget;

- Formuleringen «Det er **viktig** at du leser forklaringen for hvordan du fyller ut skjemaet nøye. Ved å fylle ut denne undersøkelsen kan få mulighet til å være med i trekningen av 10 gavekort. Hvert gavekort er på 1000 kroner», bør ikke stå innledningsvis i informasjonsskrivet. Fokuset på en potensiell belønning skal ikke gå på bekostning av annen viktig informasjon om hva deltakelsen innebærer. Vi foreslår at formuleringen står avslutningsvis under overskriften «Hva innebærer det for deg å delta?»
- Det må påføres hvordan den enkelte går frem dersom man vil benyttes seg av rettighetene sine, som f.eks. å trekke seg fra undersøkelsen. Dette må fremgå tydeligere under overskriften «Hvor kan jeg finne ut mer?»

Reviderte informasjonsskriv må sendes til personverntjenester@nsd.no, husk å oppgi prosjektnummer.

Vi minner om at hvis en registrert tar kontakt om sine rettigheter, har Universitetet i Agder plikt til å svare innen en måned. Vi forutsetter at prosjektansvarlig informerer institusjonen så fort som

mulig og at Universitetet i Agder har rutiner for hvordan henvendelser fra registrerte skal følges opp.

5. Informasjonssikkerhet

I følge meldingen skal personopplysningene behandles ved hjelp av datamaskin i nettverkssystem tilknyttet internett tilhørende virksomheten, privat datamaskin, og på server i Universitetet i Agders nettverk. Vi minner om at Universitetet i Agder er pålagt å ha kontroll på behandlingen av personopplysninger og vi anbefaler derfor ikke at personopplysninger behandles på privat utstyr uten at dette kravet kan innfris. Dette er en vurdering Universitetet i Agder må foreta. Da også studenter fra to andre forskningsinstitusjoner skal benytte opplysninger fra prosjektet, anbefaler vi at det sikres at disse dataene ikke inneholder indirekte identifiserende opplysninger.

Alle lagringsenheter beskyttes med brukernavn og passord.

Koblingsnøkkel oppbevares på passordbeskyttet pc. Kun prosjektansvarlig skal ha tilgang til denne i følge informasjonen til de som forespørres om deltakelse.

NSD forutsetter at personopplysningene behandles i tråd med personvernforordningens krav og institusjonens retningslinjer for informasjonssikkerhet.

6. Varighet

Ifølge meldeskjema skal personopplysninger behandles frem til 31.12.2019. Opplysninger som kan knyttes til en enkeltperson skal da slettes/anonymiseres.

Universitetet i Agder må kunne dokumentere at datamaterialet er anonymisert.

Anonymisering innebærer å bearbeide datamaterialet slik at ingen enkeltpersoner kan bli identifisert. Det gjøres ved å:

- Slette navn, fødselsnummer/andre ID-nummer, adresse, telefonnummer, epostadresse, IP-adresse og andre nettidentifikatorer
- Slette eller grovkategorisere alder, bosted, navn på skole, institusjon, og andre bakgrunnsopplysninger

For en utdypende beskrivelse av anonymisering av personopplysninger, se Datatilsynets veileder: https://www.datatilsynet.no/globalassets/global/regelverk-skjema/veiledere/anonymisering-veileder-041115.pdf

Meld fra om endringer

Dersom behandlingen av personopplysninger endrer seg, kan det være nødvending å melde dette til NSD via Min side. På våre nettsider informerer vi om hvilke endringer som må meldes. Vent på svar før endringen gjennomføres.

Informasjon om behandlingen publiseres på Min side, Meldingsarkivet og nettsider

Alle relevante saksopplysninger og dokumenter er tilgjengelig:

- via Min side for forskere, veiledere og studenter
- via Meldingsarkivet for ansatte med internkontrolloppgaver ved Universitetet i Agder.

NSD tar kontakt om status for behandling av personopplysninger
Etter avtale med Universitetet i Agder vil NSD følge opp behandlingen av personopplysninger ved planlagt avslutning.

Vi sender da en skriftlig henvendelse til prosjektansvarlig og ber om skriftlig svar på status for behandling av personopplysninger.

Se våre nettsider eller ta kontakt ved spørsmål. Vi ønsker lykke til med behandlingen av personopplysninger.

Med vennlig hilsen

Marianne Høgetveit Myhren
seksjonsleder

Marie S. Schildmann
seniorrådgiver

.....

Lovhenvisninger

NSDs vurdering er at den planlagte behandlingen av personopplysninger:

- er regulert av personopplysningsloven, jf. § 2.
- oppfyller prinsippene i personvernforordningen om:
  - lovlighet, rettferdighet og åpenhet jf. art. 5.1 a)
  - formålsbegrensning jf. art. 5.1 b)
  - dataminimering jf. art. 5.1 c)
  - lagringsbegrensning jf. art. 5.1 e).
- kan finne sted med hjemmel i personvernforordningen art. 6.1 a), art. 9.2 a)
- gjennomføres på en måte som ivaretar de registrertes rettigheter jf. personvernforordningen **art. 11-22**

NSD legger til grunn at institusjonen også sørger for at behandlingen gjennomføres i samsvar med personvernforordningen:

- art. 5.1 d) og art. 5.1. f) og art. 32 om sikkerhet
- art. 26-29 ved felles behandlingsansvar med andre institusjoner eller bruk av databehandler
- kapittel 5 ved overføring av personopplysninger til tredjeland/internasjonale organisasjoner

Elling Tufte Bere

Fra: Marie Strand Schildmann <Marie.Schildmann@nsd.no>
Sendt: onsdag 22. august 2018 09:30
Til: Elling Tufte Bere
Emne: Prosjektnr: 60714. En spørreundersøkelse om kosthold, fysisk aktivitet og miljø - FVMM/ATN 2018 survey

Korrigering av vurdering av prosjektet «FVMM/ATN 2018»

Jeg viser til e-post mottatt 22.08.2018 og påfølgende telefonsamtale med deg som daglig ansvarlig.

Det er nå avklart at både barn på 6. og 7. trinn samt deres foreldre vil få spørreskjema i papirformat. Det vil slik sett ikke eksistere noen koblingsmulighet mot direkte identifiserbare opplysninger (f.eks. IP-adresse). Samtykkelister er ikke knyttet til de kodene som deles ut. Kodene er tilfeldige og kan kun benyttes for å gjøre kobling av besvarelse fra elev og foreldre mulig. Den eneste muligheten for identifisering vil være gjennom bakgrunnsvariabler og navn på skole i noen få tilfeller. Jeg foreslår derfor at dette utdypes i informasjonsskrivet, f.eks. ved at dere benytter forklaringene ovenfor. Da de registrertes rettigheter likevel må stå , kan det med fordel også understrekes i avsnittet som omhandler rettighetene, at anledningen til å trekkes seg eller benytte seg av de andre rettighetene utelukkende vil være relevant dersom de helt klart kan identifiseres i datamaterialet. Det er svært få personer som vil kunne identifiseres i dette materialet, men det bør fremgå av informasjonsskrivet at dere blant annet vil ha opplysninger om hvilken skole besvarelsen fra den enkelte kommer fra.

Send det endelige informasjonsskrivet til meg og personverntjenester@nsd.no så snart det er klart!

Vennlig hilsen
Marie Strand Schildmann
Seniorrådgiver | Senior Adviser
Seksjon for personverntjenester | Data Protection Services
T: (+47) 55 58 31 52

NSD – Norsk senter for forskningsdata AS | NSD – Norwegian Centre for Research Data
Harald Hårfagres gate 29, NO-5007 Bergen
T: (+47) 55 58 21 17
postmottak@nsd.no www.nsd.no

Ansatteprosjekter - Kommentar

Navn: Elling Tufte Bere

Kommentar: Kommentert versjon av FEK søknad FVMM_ATN survey 2018.pdf

Kommentar: Hei!
Under forutsetning av at prosjektet gjennomføres som beskrevet i søknaden har FEK ingen etiske betenkeligheter med prosjektet .
Lykke til!

Mvh FEK

Karakter:

Evaluering: Godkjent

Avbryt

UiA - Søknad om etisk godkjenning av forskningsprosjekt er kommentert

R

Request@UiA <request@uia.no>
ma. 17.09.2018 14.26
kathrt13@student.uia.no

Additional comments

17/09/2018 14:25:24 CEST - Anne Valen-Sendstad Skisland
Vi informerer om at din søknad er ferdig behandlet og godkjent.

Kommentar fra godkjenner:
Hei.
Fek har behandlet din søknad om etisk godkjenning i møte 17.09.18. Prosjektet godkjennes som beskrevet. Med vennlig hilsen FEK, ved Anne Skisland

Vennligst benytt Tjenesteportalen for oppdateringer på din henvendelse/bestilling.

Med vennlig hilsen
Universitetet i Agder

Ref:MSG1344906

UNIVERSITETET I AGDER

Til elever og foresatte i 6. og 7. klassetrinn

Dato: 22.08.2018

Besøksadresse: Gimlemoen 25 I
Direkte: 38 14 23 29

Forespørsel om å delta i forskningsprosjektet FG6/ATN/(M)EAT 2018 om ernæring og fysisk aktivitet

Vi skal ved Universitetet i Agder (UiA) gjennomføre en større spørreundersøkelse i forbindelse med prosjektene Frukt og grønt i 6. (FG6), Aktiv transport til skole og jobb i Norge (ATN) og (M)EAT (om bærekraftig kosthold). I dette skrivet gir vi deg informasjon om målene for prosjektet og hva deltakelse vil innebære for deg og ditt barn.

Formål
Vi er interessert i inntaket av frukt og grønnsaker, hvordan nordmenn kommer seg til skole og jobb, samt bærekraftig kosthold. Prosjektet FG6 startet i 2001. Resultat fra dette prosjektet har bl.a. bidratt til at regjeringen fra 2007 til 2014 satte av penger til gratis skolefrukt. Nå ønsker vi å evaluere denne ordningen samt å se på endring av kostvaner over tid. I prosjektet ATN ønsker vi å se på utvikligne fra 2008 til 2018 på transportvaner til jobb og skole, og i prosjektet (M)EAT ønsker vi å se på nordmenns forhold til et bærekraftig kosthold.

Ansvarlig for prosjektene
Dette er forskningsprosjekt i regi av Universitetet i Agdet (UiA). Seks masterstudenter (fire fra Universitetet i Agder), en fra OsloMet - storbyuniversitetet og en fra Norges miljø- og biovitenskapelige universitet (NMBU) skal skrive sine oppgaver basert på data som samles inn.

Hvorfor får du spørsmål om å delta?
Vi har tilfeldig trukket ut 38 skoler i Hedmark og Telemark hvor 6. og 7. klassinger og en av deres foreldre inviteres til å delta. Tilsvarende undersøkelsen har blitt gjennomført på de samme skolene i 2001 og 2008.

Hva innebærer det for deg og din sønn/datter å delta?
Deltagelse vil si at du og ditt besvarer et spørreskjema hver (som inkluderer alle de tre nevnte prosjektene). Barna fyller ut skjemaet i en time på skolen i uke 37 eller uke 38 (september 2018). Hvis du ønsker å se spørreskjemaet til elevene før de fyller det ut, vennligst ta kontakt med undertegnede. De får så med seg en konvolutt hjem med et spørreskjema som en av foreldrene skal fylle ut, og returnere til skolen i lukket konvolutt. Dette spørreskjemaet tar ca 30 minutter å fylle ut.

Spørsmålene i spørreskjemaene omhandler inntak av frukt, grønnsaker og kjøtt, samt andre kostholdsvaner, hvordan man kommer seg til/fra skole/jobb, annen fysisk aktivitet, samt faktorer som kan relateres til dette (for eksempel tilgjengeligheten av frukt og grønnsaker hjemme, holdninger til bruk av bil, og utdanningsnivå). Elevene vil også bli spurt om høyde og vekt, om han/hun har forsøkt å slanke seg og om han/hun har prøvd alkohol og tobakk.

Det er frivillig å delta
For at du og ditt barn skal kunne delta i spørreundersøkelsen trenger vi ditt samtykke. For å delta må du derfor fylle ut svarslippen som er vedlagt og levere den til ditt barns kontaktlærer.

Det er frivillig å delta i prosjektet. Hvis dere velger å delta, kan dere når som helst trekke samtykke tilbake uten å oppgi noen grunn. Alle opplysninger om dere vil da bli anonymisert. Det vil ikke ha noen negative konsekvenser for dere hvis dere ikke vil delta eller senere velger å trekke dere.

Deres personvern – hvordan vi oppbevarer og bruker deres opplysninger
Vi vil bare bruke opplysningene om dere til formålene vi har fortalt om i dette skrivet, og ingen vil gjenkjennes i publikasjoner. Vi behandler opplysningene konfidensielt og i samsvar med personvernregelverket. De som har tilgang på data er de nevnte masterstudentene samt veiledere. Spørreskjemaene er merket med et nummer som kobler svar fra barn og forelder, men som ikke kan kobles til navn. Undersøkelsen er likevel ikke helt anonym, da vi samler inn data som potensielt indirekte, i få tilfeller, kan kunne identifisere enkelte ved å koble variabler. F.eks. hvilken skole barnet går på samen med bakgrunnsvariabler fra foreldrenes spørreskjema.

Hva skjer med opplysningene deres når vi avslutter forskningsprosjektet?
Opplysningene anonymiseres når prosjektet er avsluttet, senest 31. desember 2019.

Deres rettigheter
De som kan identifiseres i datamaterialet (dette vil gjelde svært få, se over under *Deres personvern*), har rett til:

- innsyn i hvilke personopplysninger som er registrert om deg,
- å få rettet personopplysninger om deg,
- få slettet personopplysninger om deg,
- få utlevert en kopi av dine personopplysninger (dataportabilitet), og
- å sende klage til personvernombudet eller Datatilsynet om behandlingen av dine personopplysninger.

Hva gir oss rett til å behandle personopplysninger om dere?
Vi behandler opplysninger om deg basert på ditt samtykke. På oppdrag fra Universitetet i Agder har NSD – Norsk senter for forskningsdata AS vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket. Studien har etisk godkjenning fra Etisk komite ved fakultet for Helse- og idrettsvitenskap, Universitetet i Agder (FEK).

Hvor kan jeg finne ut mer?
Har du spørsmål eller senere ønsker å trekke deg fra prosjektet vennligst ta kontakt med:

- Universitetet i Agder ved professor Elling Bere (telefon 38142329, e-post elling.bere@uia.no) eller masterstudent Helene Kristin Olsen (telefon 93215307, e-post heleno17@student.uia.no)
- Vårt personvernombud: Ina Danielsen (telefon 45254401, e-post personvernombud@uia.no)

Vennlig hilsen

Helene Kristin Olsen
Masterstudent

Elling Bere
Professor

Samtykkeerklæring
FG6/ATN/(M)EAT 2018

Jeg har mottatt og forstått informasjon om prosjektet FG6/ATN/(M)EAT 2018, og har fått anledning til å stille spørsmål.

- ☐ Jeg samtykker til at mitt barn kan delta i spørreundersøkelsen, at han/hun kan ta med et spørreskjema hjem til meg, og at våre opplysninger behandles frem til prosjektet er avsluttet 31.12.19

Navn på barnet:_____

Skole/klasse:_____

Navn forelder (blokkbokstaver):_____

Dato og signatur

…….....

Svarslippen sendes med ditt barn tilbake til kontaktlærer.

UNIVERSITETET I AGDER

E

Universitetet i Agder
Institutt for folkehelse, idrett og ernæring
v/ Elling Bere
Serviceboks 422
4604 Kristiansand

Telefon 38 14 23 29

-FVMM/ATN.elev.cohortIII.sep18-

Spørreskjema om kosthold og fysisk aktivitet - FG6/ATN/(M)EAT 2018

Kjære elev

Dette er et spørreskjema om kosthold og fysisk aktivitet.

Det er viktig at du besvarer spørsmålene så ærlig som mulig. Vi vil gjerne at du besvarer alle spørsmålene, men er det spørsmål du ikke kan eller vil svare på kan du la det være.

Alle svarene er hemmelige. Det er ingen du kjenner som får vite hva du har svart. Du skal ikke skrive navnet ditt på skjemaet.

Er det noe du lurer på, kan du spørre prosjektmedarbeideren fra Universitetet i Agder.

Det er frivillig å svare på disse spørsmålene, og du kan trekke deg når som helst.

TAKK FOR HJELPEN!

Elling Bere
Professor
Prosjektleder

Helene Kristin Olsen
Masterstudent

Svar først på disse spørsmålene

1. Hvilken dag er det i dag?

(1) ☐ Mandag
(2) ☐ Tirsdag
(3) ☐ Onsdag
(4) ☐ Torsdag
(5) ☐ Fredag

2. Var du på skolen i går?

(1) ☐ Ja
(2) ☐ Nei

Del A

Hva spiste du i går og hvordan kom du deg til skolen?

Først ber vi deg om å svare på noen spørsmål om hvor mye frukt og bær, grønnsaker, potet og kjøtt du spiste **i hele går**. Det er viktig at du skriver opp alt.

Dagen i går er delt opp i 5 perioder: Frokost, på skolen, etter skolen, middag, middag og kvelds.

For hver periode skal du føre opp hvor mye frukt og bær, grønnsaker, poteter og kjøtt du spiste.

For å skrive ned hvor mye du spiste skal du tenke på følgende:

Frukt og **bær** måles i antall (f.eks. ett eple, en banan) eller i porsjon (f.eks. en porsjon fruktsalat)

Grønnsaker måles i antall (f.eks. en gulrot) eller i porsjon (f.eks. en porsjon salat, en porsjon brokkoli)

Poteter måles i antall (f.eks. 2 poteter) eller i porsjon (f.eks. en porsjon potetstappe eller en porsjon stekte poteter)

Kjøtt måles i antall (f.eks. pølseskiver på brødskiven) eller porsjon (til middag)

Hvis du spiste noe som ikke kan måles i stykker, porsjoner eller antall, må du beskrive best mulig hvor mye du spiste (f.eks. 2 never bringebær, 1½ skive kålrot, 3 ringer paprika).

Kjøtt deles i rødt kjøtt (f.eks. svin, lam og storfe) og hvitt kjøtt (kylling og kalkun).

Tenk tilbake til i går tidlig

Frokost

3. **Spiste du frokost i går tidlig?**
   ☐ Ja ☐ Nei

4. **Spiste du frukt eller bær i går tidlig?**
   ☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **frukt** og **bær** du spiste her:

5. **Spiste du grønnsaker i går tidlig?**
   ☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **grønnsaker** du spiste her:

6. **Spiste du kjøtt i går tidlig?**
   ☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **kjøtt** du spiste her:

7. **Hvordan kom du deg til skolen i går?**

(1) ☐ Gikk (e.l.)
(2) ☐ Syklet
(3) ☐ Ble kjørt i bil
(4) ☐ Tok buss (e.l.)

Tenk på tiden da du var på skolen i går

På skolen

8. **Spiste du skolemat/ lunsj i går?**

☐ Ja ☐ Nei

9. **Spiste du frukt eller bær til skolematen eller i friminuttene i går?**

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **frukt** og **bær** du spiste her:

10. **Spiste du grønnsaker til skolematen eller i friminuttene i går?**

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **grønnsaker** du spiste her:

11. **Spiste du kjøtt til skolematen eller i friminuttene i går?**

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **kjøtt** du spiste her:

12. **Kastet du noe av nistematen/skolelunsjen i går?**

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye mat og drikke du kastet her:

Tenk på tiden etter skoletid i går, men før middag

Etter skolen

13. Hvordan kom du deg hjem fra skolen i går?

(1) ☐ Gikk (e.l.)
(2) ☐ Syklet
(3) ☐ Ble kjørt i bil
(4) ☐ Tok buss (e.l.)

14. Spiste du frukt eller bær etter skoletid i går, men før middag?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **frukt og bær** du spiste her:

15. Spiste du grønnsaker etter skoletid i går, men før middag?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **grønnsaker** du spiste her:

16. Spiste du kjøtt etter skoletid i går, men før middag?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **kjøtt** du spiste her:

Tenk tilbake til middagstid i går

Middag

17. Spiste du middag i går?

☐ Ja ☐ Nei

18. Spiste du potet til middag i går?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **potet** du spiste her:

19. Spiste du grønnsaker til middag i går?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **grønnsaker** du spiste her:

20. Spiste du kjøtt til middag i går?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **kjøtt** du spiste her:

21. Spiste du frukt eller bær til middag eller som dessert i går?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **frukt og bær** du spiste her:

Tenk tilbake til tiden etter middag i går

22. Spiste du kveldsmat i går?

☐ Ja ☐ Nei

Kvelds

23. Spiste du frukt eller bær etter middag eller til kvelds i går?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **frukt og bær** du spiste her:

24. Spiste du grønnsaker etter middag eller til kvelds i går?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **grønnsaker** du spiste her:

25. Spiste du kjøtt etter middag eller til kvelds i går?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **kjøtt** du spiste her:

Del B

Dine meninger om frukt og grønnsaker. Nå kommer en rekke utsagn om frukt og grønnsaker. Hvor enig er du i de forskjellige utsagnene? Alternativene er **helt uenig, litt uenig, litt enig** eller **helt enig**. Hvis du ikke har noen mening, eller du ikke vet hva du skal svare, så krysser du av for **verken enig eller uenig**. Her er det ikke noe svaralternativ som er riktig eller galt. Svar slik du føler passer best for deg. Ikke bry deg om at noen spørsmål kan virke litt rare. HUSK: Kun ett kryss for hvert spørsmål!

1. Hjemme har vi vanligvis frukt stående fremme i en skål

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

2. Frukt og grønnsaker passer veldig godt som snacks/mellommåltid

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

3. Hjemme har vi som regel grønnsaker til middag hver dag

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

4. Frukt er noe av det beste jeg vet

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

5. Det hender at mor/far kutter opp frukt eller grønnsaker til meg som snacks

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

6. Jeg er glad i rå grønnsaker

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

7. Hjemme får jeg lov å spise frukt og grønnsaker når jeg vil

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

8. Mer frukt og grønnsaker gjør at måltidene smaker bedre

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

9. Hjemme har vi vanligvis alltid frukt og grønnsaker i kjøleskapet

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

Del C

Hva spiser du vanligvis? Når du fyller ut disse spørsmålene skal du tenke på hva du vanligvis spiser/drikker. Tenk gjerne på hva du har spist/drukket de siste 3 månedene. Tenk på både hva du spiser hjemme, på skolen og i fritiden. Kryss av i den ruten du føler passer best for deg.

1. Hvor ofte spiser du potet?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

2. Hvor ofte spiser du grønnsaker til middag?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

3. Hvor ofte spiser du grønnsaker på brødskivene? (f.eks. agurk, paprika, tomat)

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver eneste dag
(10) ☐ Flere ganger hver dag

4. Hvor ofte spiser du andre grønnsaker (f.eks. gulrot til skolemat)?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

5. Hvor ofte spiser du eple, appelsin, pære og banan?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

6. Hvor ofte spiser du annen frukt og bær (andre frukter og bær enn eple, appelsin, pære og banan)?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

7. Hvor ofte spiser du pommes frites?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

8. Hvor ofte spiser du potetgull?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

9. Hvor ofte spiser du godterier (sjokolade, blandet godt osv.)?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

10. Hvor ofte spiser du nudler (som f.eks. Mr Lee)?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

11. Hvor ofte spiser du boller, muffins, kake eller annen søt gjærbakst?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

12. Hvor ofte drikker du juice?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

13. Hvor ofte drikker du saft?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

14. Hvor ofte drikker du brus MED sukker (f.eks. Solo, Pepsi, Fanta, Coca-Cola)?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

15. Hvor ofte drikker du brus UTEN sukker (f.eks. Solo lett, Solo pluss, Pepsi MAX, Coca-Cola light, Tab X-tra)?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

16. Hvor ofte drikker du vann fra springen?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

17. Hvor ofte drikker du reint kjøpevann? (uten kullsyre og smak)

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

18. Hvor ofte drikker du vann med kullsyre og/ eller smak?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

19. Hvor ofte spiser du RØDT kjøtt som pålegg (skinke, pølse)?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

20. Hvor ofte spiser du pålegg av kylling/kalkun?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

21. Hvor ofte spiser du RØDT kjøtt til middag (som kotelett, karbonader, pølse, kjøttdeig)?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

22. Hvor ofte spiser du kylling/kalkun til middag?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

Del D

1. Får du frukt på skolen?

(1) ☐ Ja, gratis
(2) ☐ Ja, abonnerer
(3) ☐ Nei

2. Hvor ofte har du med deg frukt og grønnsaker hjemmefra på skolen?

(1) ☐ 5 ganger i uken eller mer
(2) ☐ 4 ganger i uken
(3) ☐ 3 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 1 ganger i uken
(6) ☐ Sjeldnere enn en dag i uken
(7) ☐ Aldri
(8) ☐ Vet ikke

3. Hvor ofte spiser du frukt og grønnsaker på skolen?

(1) ☐ 5 ganger i uken eller mer
(2) ☐ 4 ganger i uken
(3) ☐ 3 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 1 ganger i uken
(6) ☐ Sjeldnere enn en dag i uken
(7) ☐ Aldri
(8) ☐ Vet ikke

4. Hvor mange porsjoner frukt og grønnsaker tror du at en på din alder bør spise hver dag?

(1) ☐ Ingen
(2) ☐ 1
(3) ☐ 2
(4) ☐ 3
(5) ☐ 4
(6) ☐ 5
(7) ☐ Mer enn 5

5. Hvor mange porsjoner frukt og grønnsaker tror du at du spiser hver dag?

(1) ☐ Ingen
(2) ☐ 1
(3) ☐ 2
(4) ☐ 3
(5) ☐ 4
(6) ☐ 5
(7) ☐ Mer enn 5

Del E

1. Hvor langt er det fra ditt hjem til skolen?

☐ Km

2. Hvordan kommer du deg vanligvis til/fra skolen? Skriv ned antall dager i uken for hver årstid. Totalt skal summen bli 5 i alle linjer

Årstid		Går e.l.	Sykler	Blir kjørt i bil	Tar buss	Totalt
Høst (sept- nov)	Til skolen					=5 dager
	Fra skolen					=5 dager
Vinter (des- feb)	Til skolen					=5 dager
	Fra skolen					=5 dager
Vår (mars- mai)	Til skolen					=5 dager
	Fra skolen					=5 dager

3. Hvor lang tid bruker du på å gå *til og fra* skolen:

	Til	Fra	
(1)	☐	☐	Mindre enn 10 minutter
(2)	☐	☐	10-20 minutter
(3)	☐	☐	20-30 minutter
(4)	☐	☐	30 minutter eller mer
(5)	☐	☐	Går aldri

4. Hvor lang tid bruker du på å sykle *til og fra* skolen:

	Til	Fra	
(1)	☐	☐	Mindre enn 10 minutter
(2)	☐	☐	10-20 minutter
(3)	☐	☐	20-30 minutter
(4)	☐	☐	30 minutter eller mer
(5)	☐	☐	Sykler aldri

5. Bruker du sykkelhjelm?

(1) ☐ Ja
(2) ☐ Av og til
(3) ☐ Nei
(4) ☐ Sykler aldri

6. Har du gratis skyss (skolebuss) til skolen?

(1) ☐ Ja
(2) ☐ Nei

7. Dersom du tar buss, hvor langt er det fra der du bor til busstoppet?

(1) ☐ Mindre enn 250 meter
(2) ☐ 250 -500meter
(3) ☐ 500 meter til 1 km
(4) ☐ 1- 2 km
(5) ☐ 2- 3 km
(6) ☐ 3 km eller lenger

8. Er du med i noen form for organisert trening eller idrett?

(1) ☐ Ja
(2) ☐ Nei
(3) Hvis ja, skriv ned hva:

9. Utenom skoletid: Hvor mange GANGER i uken driver du idrett eller aktivitet så mye at du blir andpusten og/eller svett?

(1) ☐ Hver dag
(2) ☐ 4 - 6 ganger i uken
(3) ☐ 2 - 3 ganger i uken
(4) ☐ En gang i uken
(5) ☐ En gang i måneden
(6) ☐ Mindre enn en gang i måneden
(7) ☐ Aldri

10. Utenom skoletid: Hvor mange timer per dag pleier du å se på TV, PC, nettbrett og/eller telefon?

(1) ☐ Ingen
(2) ☐ Mindre enn en ½ time om dagen
(3) ☐ ½ - 1 time
(4) ☐ 2 - 3 timer
(5) ☐ 4 timer
(6) ☐ Mer enn 4 timer

Hvor enig er du i det som står her? HUSK: Kun ett kryss for hvert spørsmål

11. Jeg liker å gå/sykle til skolen

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

12. Jeg er redd for at noe farlig skal skje på vei til skolen

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

13. Skoleveien min er trafikksikker

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

14. Jeg går/sykler til og fra skolen selv om det er dårlig vær

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

Del F

1. Er du gutt jente

(6) ☐ Gutt
(7) ☐ Jente

2. Vennligst sett kryss ved de personene som bor hjemme hos deg (hvis din mor og far ikke bor sammen, svar da for det hjemmet du bor det meste av tiden).

(1) ☐ Mor
(1) ☐ Far
(1) ☐ Stemor
(1) ☐ Stefar

Her kan du krysse av for inntil 2 alternativer

3. I hvilket land er du født?

☐

4. I hvilket land er din mor født?

☐

5. I hvilket land er din far født?

☐

6. Hva veide du sist du veide deg?
(Hele kg) Skriv tydelig!

(1) _____ kg

7. Hvor høy var du sist du målte deg?
(Hele cm)

(1) _____ cm

8. Har du noen gang prøvd å røyke (minst en sigarett)?

(1) ☐ Ja
(2) ☐ Nei

9. Har du noen gang prøvd å snuse?

(1) ☐ Ja
(2) ☐ Nei

10. Har du noen gang prøvd å drikke alkohol?

(1) ☐ Ja
(2) ☐ Nei
(3) ☐ Vet ikke

11. Prøver du å slanke deg?

(1) ☐ Nei, vekten min er passe
(2) ☐ Nei, men jeg trenger å slanke meg
(3) ☐ Ja

12. Har du egen sykkel (uten el-motor)?

(1) ☐ Ja
(2) ☐ Nei

13. Har du egen el-sykkel?

(1) ☐ Ja
(2) ☐ Nei

14. Hvor mange timer sover du vanligvis om natten?

☐ Timer

Takk for hjelpen!

UNIVERSITETET I AGDER

F

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Spørreskjema om kosthold, fysisk aktivitet og miljø - FG6/ATN/(M)EAT 2018

Takk for at du vil delta i den felles datainnsamlingen for prosjektene Frukt og grønt i 6. (FG6), Aktiv transport til skole og jobb i Norge (ATN) og (M)EAT (om bærekraftig kosthold).

I dag har elevene i din datter/sønns klasse svart på et liknende spørreskjema.

Det er kun en av elevens foreldre/foresatte som skal fylle ut dette spørreskjemaet.

Alle svarene behandles konfidensielt. Er det spørsmål du ikke kan eller vil svare på kan du la det være.

Det ferdig utfylte skjemaet legges i den konvolutten den kom i, forsegles og sendes med din sønn/datter tilbake til kontaktlærer.

Dersom du har spørsmål eller andre henvendelser omkring prosjektet, vennligst ta kontakt med Helene Kristin Olsen på telefon 93215307, eller e-post heleno17@student.uia.no.

TAKK FOR HJELPEN!

Elling Bere
Professor
Prosjektleder

Helene Kristin Olsen
Masterstudent

1. Er du?

(1) ☐ Mann

(2) ☐ Kvinne

2. I hvilket år er du født?

1	9		

3. Hvilken dato er det i dag?

Del A - Hva spiste du i går?

Dagen i går er delt opp i 4 perioder: Frokost, mellom frokost og middag, middag og kvelds.

- Kryss av for om du spiste de forskjellige matvarene til de forskjellige tider eller ikke.
- For **frukt, grønnsaker, poteter**, o**g kjøtt** skal du også skrive HVA du spiste og HVOR MYE. Under følger en beskrivelse av hvordan du skal gjøre dette.
- Du skal også skrive ned om du kastet mat i går, samt hva og hvor mye.

For å skrive ned hvor mye du spiste og drakk skal du tenke på følgende:

Frukt og **bær** måles i antall (f.eks. ett eple, en banan) eller i porsjon (f.eks. en porsjon fruktsalat)

Grønnsaker måles i antall (f.eks. en gulrot) eller i porsjon (f.eks. en porsjon salat, en porsjon brokkoli)

Poteter måles i antall (f.eks. 2 poteter) eller i porsjon (f.eks. en porsjon potetstappe eller en porsjon stekte poteter)

Kjøtt måles i antall (f.eks. pølser/skinkeskiver på brødskiven) eller porsjon (til middag)

Hvis du spiste noe som ikke kan måles i stykker, porsjoner eller antall, må du beskrive best mulig hvor mye du spiste (f.eks. 2 never bringebær, 1½ skive kålrot, 3 ringer paprika).

Kjøtt deles i rødt kjøtt (f.eks. svin, lam og storfe) og hvitt kjøtt (kylling og kalkun).

Tenk tilbake til i går tidlig

Frokost

4. Spiste du frokost i går tidlig?

☐ Ja ☐ Nei

5. Spiste du frukt eller bær i går tidlig?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **frukt** og **bær** du spiste her:

6. Spiste du grønnsaker i går tidlig?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **grønnsaker** du spiste her:

7. Spiste du kjøtt i går tidlig?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **kjøtt** du spiste her:

8. Kastet du mat i går tidlig?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **mat du kastet**:

Tenk på tiden mellom frokost og middag i går

9. Spiste du lunsj/ formiddagsmat i går?

☐ Ja ☐ Nei

10. Spiste du frukt eller bær i tiden mellom frokost og middag i går? **Formiddag**

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **frukt** og **bær** du spiste her:

11. Spiste du grønnsaker i tiden mellom frokost og middag i går?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **grønnsaker** du spiste her:

12. Spiste du kjøtt i tiden mellom frokost og middag i går?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **kjøtt** du spiste her:

13. Kastet du mat i tiden mellom frokost og middag i går?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **mat du kastet** her:

Tenk tilbake til middagstid i går

Middag

14. Spiste du middag i går?

☐ Ja ☐ Nei

15. Spiste du potet til middag i går?

☐ Ja ☐ Nei

Hvis ja, skriv ned i hvilken form og hvor mye **potet** du spiste her:

16. Spiste du grønnsaker til middag i går?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **grønnsaker** du spiste her:

17. Spiste du frukt eller bær til middag eller som dessert i går?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **frukt** og **bær** du spiste her:

18. Spiste du kjøtt til middag i går?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **kjøtt** du spiste her:

19. Kastet du mat i forbindelse med middagen i går?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **mat** du kastet her:

Tenk tilbake til tiden etter middag i går

20. Spiste du kveldsmat i går kveld?

☐ Ja ☐ Nei

21. Spiste du frukt eller bær etter middag eller til kvelds i går? **Kvelds**

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **frukt** og **bær** du spiste her:

22. Spiste du grønnsaker etter middag eller til kvelds i går?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **grønnsaker** du spiste her:

23. Spiste du kjøtt etter middag eller til kvelds i går?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **kjøtt** du spiste her:

24. Kastet du mat etter middag eller til kvelds i går?

☐ Ja ☐ Nei

Hvis ja, skriv ned hva slags og hvor mye **mat** du kastet her:

Del B - Hva spiser du vanligvis?

Når du fyller ut disse spørsmålene skal du tenke på hva du vanligvis spiser/drikker. Tenk gjerne på hva du har spist/drukket de siste 3 månedene. Tenk på både hva du spiser hjemme, på arbeid og i fritiden. Kryss av i den ruten du føler passer best for deg.

1. Hvor ofte spiser du potet?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

2. Hvor ofte spiser du grønnsaker til middag?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

3. Hvor ofte spiser du grønnsaker på brødskivene?

(11) ☐ Aldri
(12) ☐ Sjeldnere enn 1 gang i uken
(13) ☐ 1 gang i uken
(14) ☐ 2 ganger i uken
(15) ☐ 3 ganger i uken
(16) ☐ 4 ganger i uken
(17) ☐ 5 ganger i uken
(18) ☐ 6 ganger i uken
(19) ☐ Hver eneste dag
(20) ☐ Flere ganger hver dag

4. Hvor ofte spiser du andre grønnsaker (f.eks. gulrot til lunchen)?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

5. Hvor ofte spiser du eple, appelsin, pære og banan?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

6. Hvor ofte spiser du annen frukt og bær (andre frukter og bær enn eple, appelsin, pære og banan)?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

7. Hvor ofte spiser du nudler (f.eks. Mr.Lee)?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

8. Hvor ofte spiser du potetgull?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

9. Hvor ofte spiser du godterier (sjokolade, blandet godt osv.)?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

10. Hvor ofte spiser du boller, muffins, kake eller annen søt gjærbakst?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

11. Hvor ofte drikker du juice?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

12. Hvor ofte drikker du saft?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

13. Hvor ofte drikker du brus MED sukker?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

14. Hvor ofte drikker du brus UTEN sukker?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

15. Hvor ofte drikker du vann fra springen?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

16. Hvor ofte drikker du reint kjøpevann? (uten kullsyre og smak)

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

17. Hvor ofte drikker du vann med kullsyre og/ eller smak?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

18. Hvor ofte spiser du RØDT kjøtt som pålegg (skinke, pølse)?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

19. Hvor ofte spiser du pålegg av kylling/kalkun?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

20. Hvor ofte spiser du RØDT kjøtt til middag (som kotelett, karbonader, pølse, kjøttdeig)?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

21. Hvor ofte spiser du kylling/kalkun til middag?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver dag
(10) ☐ Flere ganger hver dag

Del C - Spørsmål om deg og ditt

1. Hvor mye bor du sammen med din sønn/datter?

(1) ☐ Hele tiden
(2) ☐ 50% eller mer av tiden
(3) ☐ Mindre enn 50%

2. Hvor mange personer er dere i familien (bor sammen til daglig)?

☐ Voksne

☐ Barn

3. Hva veide du sist du veide deg?

_____ kg

4. Hvor høy var du sist du målte deg?

_____ cm

5. Trener/mosjonerer du regelmessig?

(1) ☐ Ja

(2) ☐ Nei

(3) Hvis ja, skriv hva :

6. Utenom arbeidstid: Hvor mange GANGER i uken driver du idrett eller mosjonerer du så mye at du blir andpusten og/eller svett?

(1) ☐ Hver dag

(2) ☐ 4 - 6 ganger i uken

(3) ☐ 2 - 3 ganger i uken

(4) ☐ En gang i uken

(5) ☐ En gang i måneden

(6) ☐ Mindre enn en gang i måneden

(7) ☐ Aldri

7. Utenom arbeidstid: Hvor mange timer per dag pleier du å se på TV og/eller sitte foran PC'en?

(1) ☐ Ingen

(2) ☐ Mindre enn en ½ time om dagen

(3) ☐ ½ - 1 time

(4) ☐ 2 - 3 timer

(5) ☐ 4 timer

(6) ☐ Mer enn 4 timer

8. Har du egen sykkel (uten el-motor)?

(1) ☐ Ja

(2) ☐ Nei

9. Har du egen el-sykkel?

(1) ☐ Ja

(2) ☐ Nei

10. Hvor stor andel av syklingen din gjøres med el-sykkel (0-100%)?

_____ %

11. Hvor mange biler har familien din?

☐ Bil(er)

12. Neste gang familien skal kjøpe bil: Kommer dere til å kjøpe en "miljøvennlig" bil?

(1) ☐ Ja, helt klart

(2) ☐ Det vil bli vurdert

(3) ☐ Nei

13. Hvor mange bøker har dere hjemme hos dere?

(50 bøker er ca. 1 meter i bokhyllen)

(1) ☐ Ingen bøker

(2) ☐ Mindre enn 20

(3) ☐ 20 - 50

(4) ☐ 50 - 100

(5) ☐ 100 - 500

(6) ☐ 500 – 1000

(7) ☐ Mer enn 1000

14. Hvor ofte er familien din på tur i skogen/ på fjellet

(1) ☐ Aldri

(2) ☐ Sjeldnere enn 1 gang per måned

(3) ☐ Sjeldnere enn 1 gang per uke

(4) ☐ 1 gang i uken

(5) ☐ Mer enn 1 gang i uken

15. Røyker du?

(1) ☐ Nei, jeg har aldri røykt fast

(2) ☐ Nei, jeg har sluttet

(3) ☐ Ja, men ikke daglig

(4) ☐ Ja, daglig

16. Snuser du?

(1) ☐ Nei, jeg har aldri snust fast

(2) ☐ Nei, jeg har sluttet

(3) ☐ Ja, men ikke daglig

(4) ☐ Ja, daglig

17. Hvor ofte drikker du alkohol?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uka
(3) ☐ Ukentlig, men ikke daglig
(4) ☐ Daglig

18. Prøver du å slanke deg?

(1) ☐ Nei, vekten min er passe
(2) ☐ Nei, men jeg trenger å slanke meg
(3) ☐ Ja

19. Hvor mange timer sover du vanligvis om natten?

☐ Timer

20. Hvor lang utdanning har du?

(1) ☐ Grunnskole
(2) ☐ Videregående skole (inkl. gymnas/yrkesskole)
(3) ☐ Universitet eller høyskole (3 år eller mindre)
(4) ☐ Universitet eller høyskole (mer enn 3 år)

21. Hvor lang utdanning har din ektefelle/samboer?

(1) ☐ Grunnskole
(2) ☐ Videregående skole (inkl. gymnas/yrkesskole)
(3) ☐ Universitet eller høyskole (3 år eller mindre)
(4) ☐ Universitet eller høyskole (mer enn 3 år)
(5) ☐ Har ikke ektefelle/samboer

22. Hva var din husstands samlede årsinntekt for forrige år (brutto)?

_____ kr

23. Ranger trafikksikkerheten på skoleveien til barnet ditt fra 1 (meget farlig vei) til 10 (helt trygg vei)?

☐ km

24. Hva er ditt og din partners nåværende arbeid og stillingsprosent?

Deg selv_____ i _____%

Din partner_____ i _____%

25. Hvis det hadde vært stortingsvalg kommende mandag, hvilket parti ville du stemme på?

(1) ☐ Rødt
(2) ☐ Sosialistisk Venstreparti
(3) ☐ Arbeiderpartiet
(4) ☐ Senterpartiet
(5) ☐ Miljøpartiet: De grønne
(6) ☐ Kristelig folkeparti
(7) ☐ Venstre
(8) ☐ Høyre
(9) ☐ Fremskrittspartiet
(10) ☐ Annet parti……...
(11) ☐ Ville ikke stemt

26. Hvor ofte ser du på tv mens du spiser?

(1) ☐ Aldri
(2) ☐ Sjeldnere enn 1 gang i uken
(3) ☐ 1 gang i uken
(4) ☐ 2 ganger i uken
(5) ☐ 3 ganger i uken
(6) ☐ 4 ganger i uken
(7) ☐ 5 ganger i uken
(8) ☐ 6 ganger i uken
(9) ☐ Hver eneste dag
(10) ☐ Flere ganger hver da

Del E - Spørsmål om hvordan du kommer deg til arbeid (arbeider du både utenfor hjemmet og hjemme, tenk kun på arbeidsplassen utenfor hjemmet)**.**

1. Hvordan er din arbeidssituasjon?

(1) ☐ Arbeider kun utenfor hjemmet

(2) ☐ Arbeider både utenfor hjemmet og hjemme

(3) ☐ Arbeider kun hjemme/hjemmekontor (gå til spørsmål 21)

(4) ☐ Arbeider ikke/er hjemmeværende (gå til spørsmål 21)

2. Hvor mange dager i uka arbeider du utenfor hjemmet?

☐ dager

3. Hvordan kom du deg til arbeid i går?

(1) ☐ Gikk

(2) ☐ Syklet

(3) ☐ Kjørte bil

(4) ☐ Tok kollektiv transport (buss, tog e.l.)

(5) ☐ Var ikke på jobb utenfor hjemmet i går

4. Hvordan kom du deg fra arbeid i går?

(1) ☐ Gikk

(2) ☐ Syklet

(3) ☐ Kjørte bil

(4) ☐ Tok kollektiv transport (buss, tog e.l.)

(5) ☐ Var ikke på jobb utenfor hjemmet i går

5. Hvordan kommer du deg vanligvis til og fra arbeid utenfor hjemmet. Skriv inn antall dager i en normal uke ved de forskjellige årstidene. Summer for hver linje (jobber du 5 dager/uke utenfor hjemmet skal summen for hver linje bli 5, jobber du 3 dager utenfor hjemmet/uke skal summen bli 3).

Årstid		Går	Sykler/ el-sykler	Kjører bil (motorsykkel e.l.)	Kollektiv transport	Totalt
Høst (sept- nov)	Til arbeid					=
	Fra arbeid					=
Vinter (des- feb)	Til arbeid					=
	Fra arbeid					=
Vår (mars- mai)	Til arbeid					=
	Fra arbeid					=
Sommer (jun- aug)	Til arbeid					=
	Fra arbeid					=

6. Har du tilgang på parkeringsplass på arbeidsplassen?

(1) ☐ Ja

(2) ☐ Nei

7. Når du kjører/tar bil til jobb, hvor mange voksne er det vanligvis i bilen?

☐ voksne

8. Hvor langt er det fra hjemmet til arbeidet?

☐ km

9. Hvor lang tid bruker du på å gå *til og fra* arbeid (NB: et svar til arbeid og et svar fra):

	Til	Fra	
(1)	☐	☐	Mindre enn 10 min
(2)	☐	☐	10-20 min
(3)	☐	☐	20-30 min
(4)	☐	☐	30 min eller mer
(5)	☐	☐	Går aldri

10. Hvor lang tid bruker du på å sykle *til og fra* arbeid:

	Til	Fra	
(1)	☐	☐	Mindre enn 10 min
(2)	☐	☐	10-20 min
(3)	☐	☐	20-30 min
(4)	☐	☐	30 min eller mer
(5)	☐	☐	Sykler aldri

11. Dersom du går eller sykler *til og fra* arbeid, blir du andpusten og/eller svett?

	Til	Fra	
(1)	☐	☐	Ja
(2)	☐	☐	Nei

12. Har du sykkelhjelm?

(3) ☐ Ja

(4) ☐ Nei

13. Bruker du sykkelhjelm når du sykler til jobb?

(1) ☐ Ja

(2) ☐ Av og til

(3) ☐ Nei

(4) ☐ Sykler aldri

14. Ranger trafikksikkerheten på arbeidsveien din fra 1 (meget farlig vei) til 10 (helt trygg).

☐

15. Er det noe konkret som hindrer deg i å gå /sykle til arbeid så ofte som du vil?

(1) ☐ Ja

(2) ☐ Nei

(3) Hvis ja, skriv hva:

16. Dersom du tar kollektiv transport til arbeid, hvor langt er det fra der du bor til holdeplassen/stasjonen?

☐ km

17. Dersom du tar kollektiv transport, hvordan kommer du deg som regel til holdeplassen/stasjonen

(1) ☐ Går

(2) ☐ Sykler

(3) ☐ Kjører bil

Her er noen påstander rundt arbeids- og skolevei. Hvor enig/uenig er du i påstandene?

18. Jeg liker å gå/sykle til arbeid

(1) ☐ Helt uenig

(2) ☐ Litt uenig

(3) ☐ Verken enig eller uenig

(4) ☐ Litt enig

(5) ☐ Helt enig

19. Jeg bruker veien til arbeid som trening for å holde meg i god fysisk form

(6) ☐ Helt uenig

(7) ☐ Litt uenig

(8) ☐ Verken enig eller uenig

(9) ☐ Litt enig

(10) ☐ Helt enig

20. Jeg går/sykler sjelden til/fra arbeid hvis det er dårlig vær

(11) ☐ Helt uenig
(12) ☐ Litt uenig
(13) ☐ Verken enig eller uenig
(14) ☐ Litt enig
(15) ☐ Helt enig

21. Jeg er opptatt av at mitt barn skal gå/sykle til skolen

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

Del F - Hvor enig/uenig er du i følgende påstander relatert til klima/miljø

1. Miljøpolitikken har stor betydning for hvilket parti jeg stemmer på

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

2. Jeg reduserer mitt generelle forbruk for å ta vare på miljøet

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

3. Jeg velger bevisst varer som er merket med disse miljømerkene:

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

4. Jeg utfører miljøvennlige tiltak i hjemmet mitt for å få ned energibruken

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

5. Jeg er flink til å kildesortere husholdningsavfallet

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

6. Jeg kjører minst mulig bil for å begrense mitt CO2 utslipp.

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

7. Jeg går og sykler ofte distanser hvor andre gjerne kjører bil

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

8. Når jeg har et reelt reisevalg så velger jeg alltid det mest miljøvennlige alternativet (f.eks. tog vs fly, sykkel vs bil)

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

9. Jeg bruker alltid bil når jeg skal handle mat

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

10. Jeg handle ofte økologiske matvarer

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

11. Jeg handler ofte lokalproduserte matvarer

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

12. Jeg prøver å spise mindre animalske matvarer (kjøtt, fisk, meieriprodukter og egg) for å spare miljøet

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

13. Jeg kaster nesten aldri mat

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

14. Jeg prøver å kjøpe matvarer når de er i sesong

(1) ☐ Helt uenig
(2) ☐ Litt uenig
(3) ☐ Verken enig eller uenig
(4) ☐ Litt enig
(5) ☐ Helt enig

15. Jeg dyrker spiselige planter hjemme til eget bruk (f.eks. bær, grønnsaker).

(1) ☐ Ja i stor grad
(2) ☐ Ja noe
(3) ☐ Nei

16. Jeg høster spiselige ville planter (f.eks. ville bær) og/eller plukker sopp.

(1) ☐ Ja i stor grad
(2) ☐ Ja noe
(3) ☐ Nei

17. Jeg fisker

(1) ☐ Ja i stor grad
(2) ☐ Ja noe
(3) ☐ Nei

18. Jeg går på jakt

(1) ☐ Ja i stor grad
(2) ☐ Ja noe
(3) ☐ Nei

19. Hvis vi antar at klimaet endrer seg (mot global oppvarming), mener du…

(1) ☐ Det hovedsakelig skyldes menneskelig aktivitet
(2) ☐ Det hovedsakelig skyldes naturlige endringer
(3) ☐ Det skyldes likeverdig menneskelig aktivitet og naturlige endringer
(4) ☐ Ingen av delene over da klimaet ikke endrer seg
(5) ☐ Vet ikke

20. Hvor viktig er global oppvarming som tema for deg personlig

(1) ☐ Ikke viktig i det hele tatt
(2) ☐ Ikke spesielt viktig
(3) ☐ Litt viktig
(4) ☐ Veldig viktig

For hver av de følgende endringene i livsstil, kryss av for hvor effektivt du mener de forskjellige er for å motvirke global oppvarming

21. Stemme på et parti som har global oppvarming høyt på agendaen

(1) ☐ Ikke effektivt i det hele tatt
(2) ☐ Ikke særlig effektivt
(3) ☐ Noe effektivt
(4) ☐ Veldig effektivt
(5) ☐ Vet ikke

22. Redusere mitt generelle forbruk

(1) ☐ Ikke effektivt i det hele tatt
(2) ☐ Ikke særlig effektivt
(3) ☐ Noe effektivt
(4) ☐ Veldig effektivt
(5) ☐ Vet ikke

23. Velge produkt som er merket med miljømerker

(1) ☐ Ikke effektivt i det hele tatt
(2) ☐ Ikke særlig effektivt
(3) ☐ Noe effektivt
(4) ☐ Veldig effektivt
(5) ☐ Vet ikke

24. Redusere energibruken hjemme

(1) ☐ Ikke effektivt i det hele tatt
(2) ☐ Ikke særlig effektivt
(3) ☐ Noe effektivt
(4) ☐ Veldig effektivt
(5) ☐ Vet ikke

25. Kildesortere matavfallet

(1) ☐ Ikke effektivt i det hele tatt
(2) ☐ Ikke særlig effektivt
(3) ☐ Noe effektivt
(4) ☐ Veldig effektivt
(5) ☐ Vet ikke

26. Begrense bilbruken

(1) ☐ Ikke effektivt i det hele tatt
(2) ☐ Ikke særlig effektivt
(3) ☐ Noe effektivt
(4) ☐ Veldig effektivt
(5) ☐ Vet ikke

27. Fly mindre

(1) ☐ Ikke effektivt i det hele tatt
(2) ☐ Ikke særlig effektivt
(3) ☐ Noe effektivt
(4) ☐ Veldig effektivt
(5) ☐ Vet ikke

28. Handle mer økologiske matvarer

(1) ☐ Ikke effektivt i det hele tatt
(2) ☐ Ikke særlig effektivt
(3) ☐ Noe effektivt
(4) ☐ Veldig effektivt
(5) ☐ Vet ikke

29. Handle mer lokalproduserte matvarer

(1) ☐ Ikke effektivt i det hele tatt
(2) ☐ Ikke særlig effektivt
(3) ☐ Noe effektivt
(4) ☐ Veldig effektivt
(5) ☐ Vet ikke

30. Spise mindre kjøtt

(1) ☐ Ikke effektivt i det hele tatt
(2) ☐ Ikke særlig effektivt
(3) ☐ Noe effektivt
(4) ☐ Veldig effektivt
(5) ☐ Vet ikke

31. Kaste mindre mat

(1) ☐ Ikke effektivt i det hele tatt
(2) ☐ Ikke særlig effektivt
(3) ☐ Noe effektivt
(4) ☐ Veldig effektivt
(5) ☐ Vet ikke

32. Kjøpe mat som er i sesong

(1) ☐ Ikke effektivt i det hele tatt
(2) ☐ Ikke særlig effektivt
(3) ☐ Noe effektivt
(4) ☐ Veldig effektivt
(5) ☐ Vet ikke

TAKK FOR HJELPEN!

Har du noen kommentar til spørreskjemaet eller noe du vil si om kosthold/aktivitet/miljø?
Skriv det gjerne her!

Children´s Active Commuting to School: Changes in Transportation Habits from 2008 to 2018?

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ABSTRACT

Background. Commuting to school is an opportunity for children to reach the daily physical activity recommendations. Active transportation has over the years declined. The central aim of this study was to see if there has been a development in children`s transportation mode to Norway from 2008 to 2018 relative to sex, socioeconomical status, distance, and ethnicity. In addition, a secondary goal is to present transportation habits to school in relation to sex, socioeconomical status, distance, and ethnicity in general.

Methods. Several Norwegian primary schools participated in 2008 and 2018. The data was collected with a questionnaire and a matrix. A binary logistic regression analysis was conducted to predict the relationship between transportation mode and time, in addition to transportation mode and sex, socioeconomical status, distance and ethnicity in general.

Results: From 2008 to 2018 there were no change of number of trips per week among the transportation modes. Boys were less likely to walk and be mixed commuters than girls. Boys were however more likely to cycle than girls. Pupils from parents who have lower education is more likely to cycle than pupils from parents with higher education. Pupils from parents who have lower education is less likely to be driven to school than pupils from parents with higher education. Children living 4 km or closer to school was less likely to walk to school than those living further away than 4km. This was also the case among cyclist. Amongst public transport commuters, children living closer than 4 km was more likely to take the bus than those living further than 4 km. Non-native children were less likely to walk than native children.

Conclusion. The results indicate no change in transportation mode from 2008 to 2018. There was however difference between the relation of the variables: sex, parental education, distance and ethnicity.

Keywords: active transportation, active commuting, children, pupils, primary school, time-trend, Norway

BACKGROUND

During childhood and adolescence, the importance of physical activity (PA) has been internationally accepted [1]. Children from ages 5 to 17 years is recommended minimum 60 min of moderate-to-vigorous physical activity (MVPA) evert day or more [1, 2]. Even though there are well established mental, social and physical health benefits of PA several children and adolescents are nevertheless not enough PA [3]. There is similar tendency in many other countries, it is also a concern in Norway [4-8].

Opportunities to achieve the daily level of recommended PA includes games, play, sports, active transportation (AT), recreation or planned exercise in the context of family, school and community activities [1]. PA and exercise including AT to school has declined the recent decades, in addition PA is valuable in the formative years, helping to set participation patters in PA across the lifespan [9]. Studies have shown tracking of both PA and sedentary behavior from early childhood to middle childhood and adulthood [5, 10, 11]. Adolescent PA is associated with adult PA, in addition to protective short-term benefits such as effect on bone health and mental health [12].

Achieving the PA recommendation is associated with reduced risk of as metabolic health (diabetes and obesity), cardiorespiratory health (coronary heart disease, cardiovascular disease, stroke and hypertension), musculoskeletal health (bone health and osteoporosis), different types of cancer (breast and colon cancer), mental health (depression, anxiety, self-esteem, cognitive functioning), functional health and prevention of falls [13-15]. Participation in PA may contribute to well-being such as physical self, confidence, self-acceptance, self-perception and enhance self-esteem in young people [16, 17].

Active commuting (AC) is important to the overall PA and may be a contributor to children`s daily PA [18-20]. The journey to and from school is an opportunity for children (to use AT regularly) to develop a habit of walking or cycling instead of being driven to school [21]. A study by Østergaard et al [22] indicates that cycling to school could be an important enhancement in the prevention of gaining weight, better the cardiorespiratory fitness (CRF) and show better back muscle endurance compared to passive commuters. Evidence from studies indicates that those considered as active travelers (to school) is associated with a healthier body composition [22, 23].

There is a tendency that people who walk are more active overall and show more MVPA, than those who travel by car or public transportation [24-27].

International studies among Australian, American and Canadian children show a decreasing trend of active commuting, such as walking and cycling to school, and increased use of inactive transportation modes [8, 28-31]. A similar pattern is shown in European countries were studies shows a decrease in AT to and from school in several countries plus an increase use of car as a mean to and from school [4, 31].

There are a lot of knowledge about adults PA and transportation habits. Children's and adolescence transportation habits have not been fully untangled. The recent years this topic has been further observed. This study will provide information and contribute to bring about a time-trend regarding transportation modes amongst children. It is important to explore and look at the development among children's PA level and transportation mode because it is a contributor to their physical, social and mental health. It is important to see which habits are created early on in their lifespan. Their transportation habits effects not only their physical and mental health but also the environment.

The main aim in the present study was to find out to what extent have transportation habits changed among Norwegian primary school pupils from 2008 to 2018, relative to sex, parental education, distance and ethnicity. A secondary aim was to present transportation habits to school in relation to sex, socioeconomical status (SES), distance and ethnicity in general.

METHOD

Sample and procedure

The present study is a follow-up study from the PHD study in 2008, Active Transportation to school and work in Norway (ANT). It is based on data from "cohort II" survey within the Fruits and Vegetables Make the Marks (FVMM) project [32] and data from the survey done the autumn of 2018. We applied a repeated cross-sectional study in 2008 and 2018. The sample includes 6th and 7th grades at 27 and 25 schools, respectively in 2008 and 2018, from two Norwegian counties, Hedmark and Telemark. Further the schools who participated both times was included in further analysis, giving a total of 18 schools.

All 6th and 7th graders (age 10-12 years old) among these schools were invited to take part in a questionnaire survey. A total of 911 and 561 pupils participated, respectively in 2008 and in

2018, giving a participation rate of 53 % in 2008, and 32 % in 2018. Participating children brought home a similar parent questionnaire to be completed by one of their parents. In total 675 and 407 parental questionnaire were obtained, respectively in 2008 and 2018. The participation rates for parents who got handed out a parental questionnaire from their children were 39 % in 2008 and 23 % in 2018.

Ethical approval and research clearance were obtained from The Norwegian Social Science Data Services and research clearance from the ethical committees on the faculty for public health, sports and nutrition for the University of Agder. Informed consent was obtained from parents and children prior to participation in the study. The data collection in 2008 and 2018, was completed by the children in the presence of a project member in the classroom with the baseline survey from FVMM in 2001 (with some moderations). One school lesson (from 45-60 minutes) was used to complete the questionnaire.

Instrument

Pupil questionnaire

The questionnaire includes questions concerning transportation habits wherein the participants were asked how they got to and from school. The pupils filled out a matrix (see additional file 1) answering how many days a week they usually (1) walk, (2) cycle, (3) are driven by car or (4) take public transport to and from school during the seasons fall, winter and spring. Each row had to add up to 5 days, since the pupils attend school 5 days a week. The score would range from 0 to 10, giving the number of trips walking, cycling, car commuting and public transport commuting within each season and full school year (Table 2). Based on the average number of trips per week the participants were categorized into different modes of commuting if more than 50 % of the trips were conducted by that particular mode (for details concerning the matrix see [33]). Those who did not fall into a specific mode of commuting were classified as mixed commuters. The distance from school to home were reported by the pupils. Distance was categorized into living less than 4.0 km from school, and 4.0 or more from school.

The pupils also reported sex (boy vs. girl) and ethnicity (if both parents were born in Norway, they were categorized to be native (Norwegians)).

Parents questionnaire

The parents recorded the year they were born together with their own education level (dichotomized into: high: having attended college or university, low: no college or university education) as an indicator for SES.

Statistical analysis

All statistical analyses were performed by utilizing the SPSS statistical software package version 25 (IBM Corp. in Armonk, NY). Significance level were set at $p < 0.05$.

Describing the sample, differences between 2008 and 2018 participants were analyzed using chi-square test, for the categorical variables and independent t-test for continuous variables (Table 1). To describe the difference in the number of trips per transportation mode a Mann-Whitney u-test were conducted, since the data were generally skewed (Table 2).

The main analysis conducted were binary logistic regression (log.reg) with interaction analysis. The analysis was performed separately on all dependent dichotomous variables, walkers (vs. non-walkers), cyclist (vs. non-cyclist), car commuter (vs. non-car commuters), public transport commuters (vs. non- public transport commuters), and mixed commuters (vs. non-mixed commuters). Each independent variable sex (boy vs. girl), parental education (low vs. high), distance to school (less than 4 km vs. more than 4 km) and ethnicity (not-Norwegian (non-native) vs. Norwegian(native)) was tested individually with a. If p-value was < 0.3 they were included in a combined log.reg. From there independent variables were included or excluded if p-value was <0.05. On the remaining independent variables an interaction between the respective independent variables and time. The results from the analysis are given as odds ratio (OR) with confidence intervals (95 % CI) who are given for each independent variable.

RESULTS

Descriptive data presented in Table 1 displays twenty-seven schools in 2008 and twenty-five schools in 2018, still there were more eligible pupils in 2018 with 1734 opposed to 1712 in 2008. In both 2008 and 2018 there were more participants from Hedmark, however the portion has reduced from 65 % to 59 % ($p<0.016$). Among the eligible pupils 911 participants in 2008 and 561 in 2018, showing that there was a lower participation rate in 2018 with 32 % and 52 % in 2008. There has been an increased in parental age from 41 years (SD 5.1) in 2008 to 43 years (SD 5.5) in 2008 ($p<0.001$). Higher education amongst parents

have amplified from 55 % to 69 %, respectively from 2008 to 2018 ($p<0.001$). In 2008 83 % of the participants had to parents how were born in Norway, while in 2018 there was 74 % ($p<0.001$).

Table 1

Descriptive characteristics of the study sample from schools participating in both 2008 and 2018.

	2008	**2018**	**P-value***
Number of schools	27	25	
Eligible pupils	1712	1734	
County (% Hedmark)	65	59	0.016**
Pupil data			
Participating pupils	911	561	
Participating rate of pupils (%)	53	32	
Sex of pupils (% girls)	52	57	0.071
Age of pupils (% seventh graders)	49	53	0.086
Distance to school (% less than 4km)	85	83	0.534
Parental data			
Participating parents	675	407	
Participating rate of parents (%)	39	23	
Sex of parent (% woman)	79	79	0.941
Age of parents (mean, years (SD))	41 (5.1)	43 (5.5)	0.001*
Education of parents (% with higher edu.)	55	69	0.001**
Ethnicity (% both parents Norwegian)	83	74	0.001**

P-value are based on independent t-test (*) for continuous variable and for dichotomous variables p-value are based on Chi Square test (**), p <0.05.

SD = Standard Deviation

Table 2 shows the different modes of commuting to school in number of trips per week. There was no overall significant difference between 2008 and 2018 in commuting mode. Neither within the seasons the different commuting modes did not differ between the two time periods. This can be seen for instance during the fall were the mean for (1) walking was 2.67 and 2.75, (2) cycling was 4.98 and 4.73, (3) car commuting was 0.46 and 0.46 and (4) public

transport commuting was 1.32 and 1.14 times/week, respectively in 2008 and 2018. There was no significant difference between the time periods.

(Table 2 would appear here)

In the final analysis (Table 3) the participants are categorized as walkers, cyclist, car -, public transport– and mixed commute.

There are little alterations in time compared to transportation habits among the participating pupils which has was significant. There were significant findings between transportation habits in relation to sex, SES, distance and ethnicity.

The one change in time was among public transportation commuters, were pupils in 2008 were less likely to take public transportation than in 2018, OR = 0.95, 95%, CI: 0.91-0.99. Other than public transportation there were no significant results with regards to transportation.

Boys were less likely to walk to school compared to girls, OR=0.65 (95 % CI: 0.50-0.82). Pupils living less than 4 km from school were less likely to walk to school compared to those living further from school, OR= 0.06 (95 % CI: 0.03-0.12). Non-native children were less likely to walk compared to native children, OR=0.58 (95 % CI: 0.43-0.77).

Boys were more likely to cycle to school than girls OR = 1.66 (95 % CI: 1.24-2.12). Pupils from parents with low education compared to pupils from parents with high education were more likely to use bicycle as their transportation mode to school (OR = 1.60, 95 % CI: 1.21-2.12). Children living less than 4 km from school was less likely to cycle to school compared to those living 4 km or further from school with an odds ratio at 0.16 (95 % CI: 0.10-0.26).

Pupils from parents with low education was less likely to be categorized as car commuter compared to pupils from parents with high education (OR = 0.49, 95% CI: 0.28-0.86).

The pupils living less than 4 km from school was more likely to take public transportation compared to those living 4 km or further from school with an odds ratio of 49.08 (95 %, CI: 31.90-75.52).

Boys were less likely to be categorized as mixed commuters compared to girl with an odd ratio of 0.49 (95%, CI: 0.33-0.72).

(Table 3 would appear here).

DISCUSSIONS

In the present study, the results indicate no change in transportation mode among Norwegian children between 2008 and 2018. We see consistency in the number of trips taken per week among the different transportation modes in children's commute to school.

The findings in our study indicates something other than previous studies in the same time-period, were there has been a decline in active transportation to school (ATS) among several European countries [4, 8, 28-31]. For instance Grize et al [31] study shows that ATS has decreased from 1994 to 2005. In line with the present study, a study among Canadian children did not show any changes in transportation habits between 2007 to 2015 [34].

This study used a matrix and a questionnaire to calculate the number of trips children take during fall, winter and spring within the different transportation mode. This has only been done by a few other studies [33, 35].

Even though there is no significant difference between transportation modes from 2008 to 2018 there are some differences in regard to sex, parental education, distance and ethnicity.

Sex difference in ATS were observed in our study and are consistent with the preponderance of published literature showing that boys are more engaged in ATS and sport/exercise than girls [8, 18, 22, 34, 36-38].

Parental education may have an effect on transportation mode, in this study children from parents with low education were more likely to cycle and less likely to get driven to school compared to children from parents with high education. Other studies shows different findings, were children with higher SES were more likely to meet the PA recommendations and were more likely to be walkers or cyclist than children from low SES [8, 35].

Differences effecting transportation mode such as distance were observed in this study. If children lived closer than 4 km, they were less likely to walk or cycle, however they were more likely to take public transportation. A Fyhri, R Hjorthol, RL Mackett, TN Fotel and M Kyttä [4] study shows that distance to school has increased and that this might influence the AC to school. Former studies show that distance confirmed to have an impact on

transportation modes, showing that the active traveling declined as the distance increased [24, 29, 39-42].

Ethnicity was lone significant among walkers, were native children were more likely to walk than non-native children. There were no other significant association between transportation mode and ethnicity. To the authors knowledge there are little studies comparing native Norwegian and non-native Norwegian youth to their transportation habits. A study by LA Børrestad, LB Andersen and E Bere [35] found no significant association between commuting mode and ethnicity.

Limitations and Strengths

There are some limitations and strengths to this study that should be noted. A strength of the present study is the large sample and the use of both a questionnaire and the comprehensive matrix design to measure on commuting to school, making it possible to assess the frequency of the different modes of active commuting to and from school [33, 41]. Another strength is that the study includes repeated data from a large number of randomized selected schools. The gender representation in the study is quite evenly distributed, which is ideally. The study only had participating pupils from two of Norway's 19 counties. Nevertheless, Norway is a rather homogenous country which make us believe that the results may be generalizable to the other counties as well [43]. Other strength in this study is that the schools participating from these counties was similar to each other in terms of geography and socioeconomic composition [44]. A limitation to the study was that the measure of transportation to school were self-reported. Self-reported data could affect the results, participants may answer differently about the frequency of active commuting either because they did not fully understand the question/matrix or to adhere to social norms regarding PA. Ethnicity is not as homogenous as the two classified groups in this study, but more nuanced that the two categories [35]. Several parents who participated in the study had higher education. This is a limitation to the study because it presents an uneven image of the SES in Norway which are lower than among the participants in this study [45].

The cross-sectional design makes it impossible to draw conclusions concerning exact causal relationship concerning active commuting and determinants.

CONCLUSION

The results indicate no significant change in transportation habits from 2008 to 2018 among Norwegian primary school pupils, relative to sex, SES, distance and ethnicity. There were however differences in relation to sex, SES, distance and ethnicity in general. Boys were more engaged in cycling, while girls were more engaged in walking. Pupils with low SES were more likely to cycle and less likely to be driven to school. With a shorter distance to school pupils were less likely to walk or cycle, but more likely to take public transportation to school. Not-native children were less likely to walk than native children.

The authors recommend further research studies to examine the effect the determinants have on AT. For public and environmental health, more knowledge about commuting habits is important to identify positive and negative determinants as well as effective models for using evidence in the policy making. Furthermore, future public health strategies should encourage a high level of active commuting and create environment promoting an AT choice.

LIST OF ABBREVIATIONS

- AC - Active commuting
- ANT – Active Transportation to school and work in Norway
- AT – Active transportation
- ATS – Active transportation to school
- CRF – Cardiorespiratory fitness
- FVMM - Fruits and Vegetables Make the Marks
- MVPA – Moderate-to-vigorous physical activity
- PA – Physical activity
- SES - Socioeconomical status

DECLARATIONS

Ethics approval and consent to participate

Ethical approval and research clearance were obtained from The Norwegian Social Science Data Services and research clearance from the ethical committees on the faculty for public health, sports and nutrition for the University of Agder. Informed consent was obtained from parents and children prior to participation in the study

Availability of data and material

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

All authors read and approved the final manuscript.

297 **Table 2**

298 Self-reported frequency of different modes of commuting to school among pupils in 2008 and 2018.

Pupils		**Walking**			**Cycling**			**Car**			**Public transportation**		
n= 1492		2008	2018	p-value	2008	2018	p-value	2008	2018	p-value	2008	2018	p-value
Fall	Median	0.00	0.00	0.840	5.00	4.00	0.385	0.00	0.00	0.872	0.00	0.00	0.328
	(IQR)	(6.00)	(6.00)		(10.00)	(10.00)		(0.00)	(0.00)		(0.00)	(0.00)	
	Mean	2.67	2.75		4.98	4.73		0.46	0.46		1.32	1.14	
	(SD)	(4.03)	(4.14)		(4.59)	(4.62)		(1.64)	(1.79)		(3.24)	(3.01)	
Winter	Median	9.00	9.00	0.417	0.00	0.00	0.947	0.00	0.00	0.223	0.00	0.00	0.835
	(IQR)	(10.00)	(10.00)		(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)	
	Mean	6.25	5.96		0.05	0.05		1.07	0.97		1.56	1.50	
	(SD)	(4.41)	(4.55)		(0.48)	(0.47)		(2.56)	(3.46)		(3.47)	(3.40)	
Spring	Median	0.00	0.00	0.226	5.00	5.00	0.829	0.00	0.00	0.549	0.00	0.00	0.160
	(IQR)	(6.00)	(5.50)		(10.00)	(10.00)		(0.00)	(0.00)		(0.00)	(0.00)	
	Mean	2.89	2.68		4.98	4.94		0.42	0.43		1.27	1.02	
	(SD)	(4.02)	(4.05)		(4.47)	(4.57)		(1.52)	(1.62)		(3.17)	(2.84)	
Average	Median	3.33	3.33	0.385	3.33	3.33	0.542	0.00	0.00	0.185	0.00	0.00	0.749
	(IQR)	(6.67)	(6.00)		(6.67)	(6.67)		(0.00)	(0.00)		(0.00)	(0.00)	
	Mean	3.94	3.80		3.34	3.24		0.65	0.64		1.38	1.22	
	(SD)	(3.46)	(3.49)		(2.85)	(2.91)		(1.65)	(1.74)		(3.21)	(2.88)	

299 *Figures are number of trips per week, p-value <0.05 are based on Mann-Whitney u-test.*

300 *SD = Standard Deviation*

301 *IQR = Interquartile range*

Table 3

Odds ratio for being a walker, cyclist, car commuter, public transport commuter or mixed commuter for both 2008 and 2018, collected in two Norwegian counties in 2008 and 2018.

Pupils n = 1472		**Total OR**	**(95% CI)**
Walkers	Year (2008/2018)	0.99	(0.97-1.02)
	Sex (boy vs. girl)	0.65*	(0.50-0.82)
	Distance (<4 km school/home vs. >4 km school/home)	0.06*	(0.03-0.12)
	Ethnicity (Not-Norwegian- Norwegian)	0.58*	(0.43-0.77)
Cyclist	Year (2008/2018)	1.00	(0.97-1.03)
	Sex (boy vs. girl)	1.62*	(1.24-2.12)
	Parental education (low vs. high)	1.60*	(1.21-2.12)
	Distance (<4 km school/home vs. >4 km school/home)	0.16*	(0.10-0.26)
Car commuter	Year (2008/2018)	1.05	(0.99-1.12)
	Parental education (low vs. high)	0.49*	(0.28-0.86)
Public transport commuter	Year (2008/2018)	0.95*	(0.91-0.99)
	Distance (<4 km school/home vs. >4 km school/home)	49.08*	(31.90-75.52)
Mixed commuters	Year (2008/2018)	1.02	(0.98-1.95)
	Sex (boy vs. girl)	0.49*	(0.33-0.72)

**Significant difference between groups based on interaction binary logistic regression, p<0.05.*

REFERENCES

1. World Health Organization: **Global recommendations on physical activity for health**. In.: World Health Organization; 2010: 1-60.

2. **Recommendations for physical activity** [https://helsedirektoratet.no/folkehelse/fysisk-aktivitet/anbefalinger-fysisk-aktivitet]

3. Cooper AR, Goodman A, Page AS, Sherar LB, Esliger DW, van Sluijs EM, Andersen LB, Anderssen S, Cardon G, Davey R: **Objectively measured physical activity and sedentary time in youth: the International children's accelerometry database (ICAD)**. *International journal of behavioral nutrition and physical activity* 2015, **12**(1):113.

4. Fyhri A, Hjorthol R, Mackett RL, Fotel TN, Kyttä M: **Children's active travel and independent mobility in four countries: Development, social contributing trends and measures**. In: *Transport Policy.* vol. 18; 2011: 703-710.

5. Deng WH, Fredriksen PM: **Objectively assessed moderate-to-vigorous physical activity levels among primary school children in Norway: The Health Oriented Pedagogical Project (HOPP)**. In: *Scandinavian journal of public health.* vol. 46; 2018: 38-47.

6. Knuth AG, Hallal PC: **Temporal trends in physical activity: a systematic review**. *Journal of Physical Activity and Health* 2009, **6**(5):548-559.

7. Dumith SC, Gigante DP, Domingues MR, Kohl III HW: **Physical activity change during adolescence: a systematic review and a pooled analysis**. In: *International Journal of Epidemiology.* vol. 40; 2011: 685-698.

8. Kalman M, Inchley J, Sigmundova D, Iannotti RJ, Tynjälä JA, Hamrik Z, Haug E, Bucksch J: **Secular trends in moderate-to-vigorous physical activity in 32 countries from 2002 to 2010: a cross-national perspective**. In: *European Journal of Public Health.* vol. 25; 2015: 37-40.

9. Hills AP, Andersen LB, Byrne NM: **Physical activity and obesity in children**. In: *British journal of sports medicine.* vol. 45; 2011: 866-870.

10. Jones RA, Hinkley T, Okely AD, Salmon J: **Tracking physical activity and sedentary behavior in childhood: a systematic review**. In: *American Journal of Preventive Medicine.* vol. 44; 2013: 651-658.

11. Tammelin R, Yang X, Leskinen E, Kankaanpaa A, Hirvensalo M, Tammelin T, Raitakari O: **Tracking of physical activity from early childhood through youth into adulthood**. In: *Med Sci Sports Exerc.* vol. 46; 2014.

12. Hallal PC, Victora CG, Azevedo MR, Wells JCK: **Adolescent physical activity and health: a systematic review**. *Sports Med* 2006, **36**.

13. Becker W, Lyhne N, Pedersen AN, Aro A, Fogelholm M, Phorsdottir I, Alexander J, Anderssen SA, Meltzer HM, Pedersen JI: **Nordic Nutrition Recommendations 2004 - integrating nutrition and physical activity**. In: *Scandinavian Journal of Nutrition.* vol. 48; 2004: 178-187.

14. Biddle S, Asare M: **Physical activity and mental health in children and adolescents: a review of reviews**. In: *British Journal of Sports Medicine.* vol. 45; 2011: 886-895.

15. Humphreys BR, McLeod L, Ruseski JE: **Physical activity and health outcomes: evidence from Canada**. In: *Health Economics.* vol. 23; 2014: 33-54.

16. Lubans D, Richards J, Hillman C, Faulkner G, Beauchamp M, Nilsson M, Kelly P, Smith J, Raine L, Biddle S: **Physical activity for cognitive and mental health in youth: a systematic review of mechanisms**. In: *Pediatrics.* vol. 138; 2016: e20161642.

17. Gill DL, Hammond CC, Reifsteck EJ, Jehu CM, Williams RA, Adams MM, Lange EH, Becofsky K, Rodriguez E, Shang Y-T: **Physical activity and quality of life**. In: *Journal of Preventive Medicine and Public Health.* vol. 46; 2013: S28.

18. Tudor-Locke C, Ainsworth BE, Adair LS, Popkin BM: **Objective physical activity of Filipino youth stratified for commuting mode to school**. In: *Medicine & Science in Sports & Exercise.* vol. 35; 2003: 465-471.

19. Southward EF, Page AS, Wheeler BW, Cooper AR: **Contribution of the school journey to daily physical activity in children aged 11–12 years**. In: *American Journal of Preventive Medicine.* vol. 43; 2012: 201-204.

20. Dalene KE, Anderssen SA, Andersen LB, Steene-Johannessen J, Ekelund U, Hansen BH, Kolle E: **Cross-sectional and prospective associations between sleep, screen time, active school travel, sports/exercise participation and physical activity in children and adolescents**. *BMC public health* 2018, **18**(1):705.

21. Wen LM, Fry D, Rissel C, Dirkis H, Balafas A, Merom D: **Factors associated with children being driven to school: implications for walk to school programs**. In: *Health Education Research.* vol. 23; 2007: 325-334.

22. Østergaard et al: **Cross sectional analysis of the association between mode of school transportation and physical fitness in children and adolescents**. In: *International Journal of Behavioral Nutrition and Physical Activity.* vol. 10; 2013.

23. Lubans et al: **The relationship between active travel to school and health-related fitness in children and adolescents: a systematic review**. In: *International Journal of Behavioral Nutrition and Physical Activity.* vol. 8; 2011.

24. van Sluijs EM, Fearne VA, Mattocks C, Riddoch C, Griffin SJ, Ness A: **The contribution of active travel to children's physical activity levels: Cross-sectional results from the ALSPAC study**. In: *Preventive Medicine.* vol. 48; 2009: 519-524.

25. Cooper AR, Wedderkopp N, Wang H, Andersen LB, Froberg K, Page AS: **Active travel to school and cardiovascular fitness in Danish children and adolescents**. In: *Medicine & Science in Sports & Exercise.* vol. 38; 2006: 1724-1731.

26. Sahlqvist S, Song Y, Ogilvie D: **Is active travel associated with greater physical activity? The contribution of commuting and non-commuting active travel to total physical activity in adults**. In: *Preventive Medicine.* vol. 55; 2012: 206-211.

27. Buehler R, Pucher J, Merom D, Bauman A: **Active travel in Germany and the US: contributions of daily walking and cycling to physical activity**. In: *American Journal of Preventive Medicine.* vol. 41; 2011: 241-250.

28. Van der Ploeg HP, Merom D, Corpuz G, Bauman AE: **Trends in Australian children traveling to school 1971–2003: Burning petrol or carbohydrates?** In: *Preventive medicine.* vol. 46; 2008: 60-62.

29. McDonald NC: **Active transportation to school: trends among US schoolchildren, 1969–2001**. In: *American Journal of Preventive Medicine.* vol. 32; 2007: 509-516.

30. Buliung RN, Mitra R, Faulkner G: **Active school transportation in the Greater Toronto Area, Canada: an exploration of trends in space and time (1986–2006)**. In: *Preventive Medicine.* vol. 48; 2009: 507-512.

31. Grize et al: **Trend in active transportation to school among Swiss school children and its associated factors: three cross-sectional surveys 1994, 2000 and 2005**. In: *International Journal of Behavioral Nutrition and Physical Activity.* vol. 7; 2010.

32. Bere E, Hilsen M, Klepp K-I: **Effect of the nationwide free school fruit scheme in Norway**. In: *British Journal of Nutrition.* vol. 104; 2010: 589-594.

33. Bere E, Bjørkelund LA: **Test-retest reliability of a new self reported comprehensive questionnaire measuring frequencies of different modes of adolescents commuting to school and their parents commuting to work-the ATN questionnaire**. In: *International Journal of Behavioral Nutrition and Physical Activity.* vol. 6; 2009.

34. Colley RC, Carson V, Garriguet D, Janssen I, Roberts KC, Tremblay MS: **Physical activity of Canadian children and youth, 2007 to 2015**. In: *Health reports.* vol. 28; 2017: 8-16.

35. Børrestad LA, Andersen LB, Bere E: **Seasonal and socio-demographic determinants of school commuting**. In: *Preventive medicine.* vol. 52; 2011: 133-135.

36. Chillón et al: **A systematic review of interventions for promoting active transportation to school**. In: *International Journal of Behavioral Nutrition and Physical Activity.* vol. 8; 2011.

37. Cooper AR, Page AS, Foster LJ, Qahwaji D: **Commuting to school: are children who walk more physically active?** In: *American journal of preventive medicine.* vol. 25; 2003: 273-276.

38. Brown B, Mackett R, Gong Y, Kitazawa K, Paskins J: **Gender differences in children's pathways to independent mobility**. In: *Children's Geographies.* vol. 6; 2008: 385-401.

39. Schlossberg M, Greene J, Phillips PP, Johnson B, Parker B: **School Trips: Rffects of Urban Form and Distance on Travel Mode**. In: *Journal of the American Planning Association.* vol. 72; 2006: 337-346.

40. Rojas Lopez MC, Wong YD: **Children's active trips to school: a review and analysis**. In: *International Journal of Urban Sustainable Development.* vol. 9; 2017: 79-95.

41. Bjørkelund OA, Degerud H, Bere E: **Socio-demographic, personal, environmental and behavioral correlates of different modes of transportation to work among Norwegian parents**. In: *Archives of Public Health.* vol. 74; 2016.

42. Mendoza JA, Watson K, Baranowski T, Nicklas TA, Uscanga DK, Nguyen N, Hanfling MJ: **Ethnic minority children's active commuting to school and association with physical activity and pedestrian safety behaviors**. In: *The Journal of Applied Research on Children: informing policy for children at risk.* vol. 1; 2010: 1-23.

43. Bere E, Glomnes ES, te Velde SJ, Klepp K-I: **Determinants of adolescents' soft drink consumption**. In: *Public Health Nutrition.* vol. 11; 2008: 49-56.

44. Bere E, Veierød MB, Klepp K-I: **The Norwegian School Fruit Programme: evaluating paid vs. no-cost subscriptions**. In: *Preventive medicine.* vol. 41; 2005: 463-470.

45. **Educational attainment of the population** [https://www.ssb.no/en/utdanning/statistikker/utniv]