



(Un)limited possibilities?

The Physical Activity Report Card⁺

on Dutch youth with a
chronic condition or disability.



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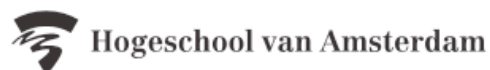
(Un)limited possibilities?

Results from the Dutch 2017 Report Card⁺ on
Dutch youth with a chronic condition or disability.





UMC Utrecht



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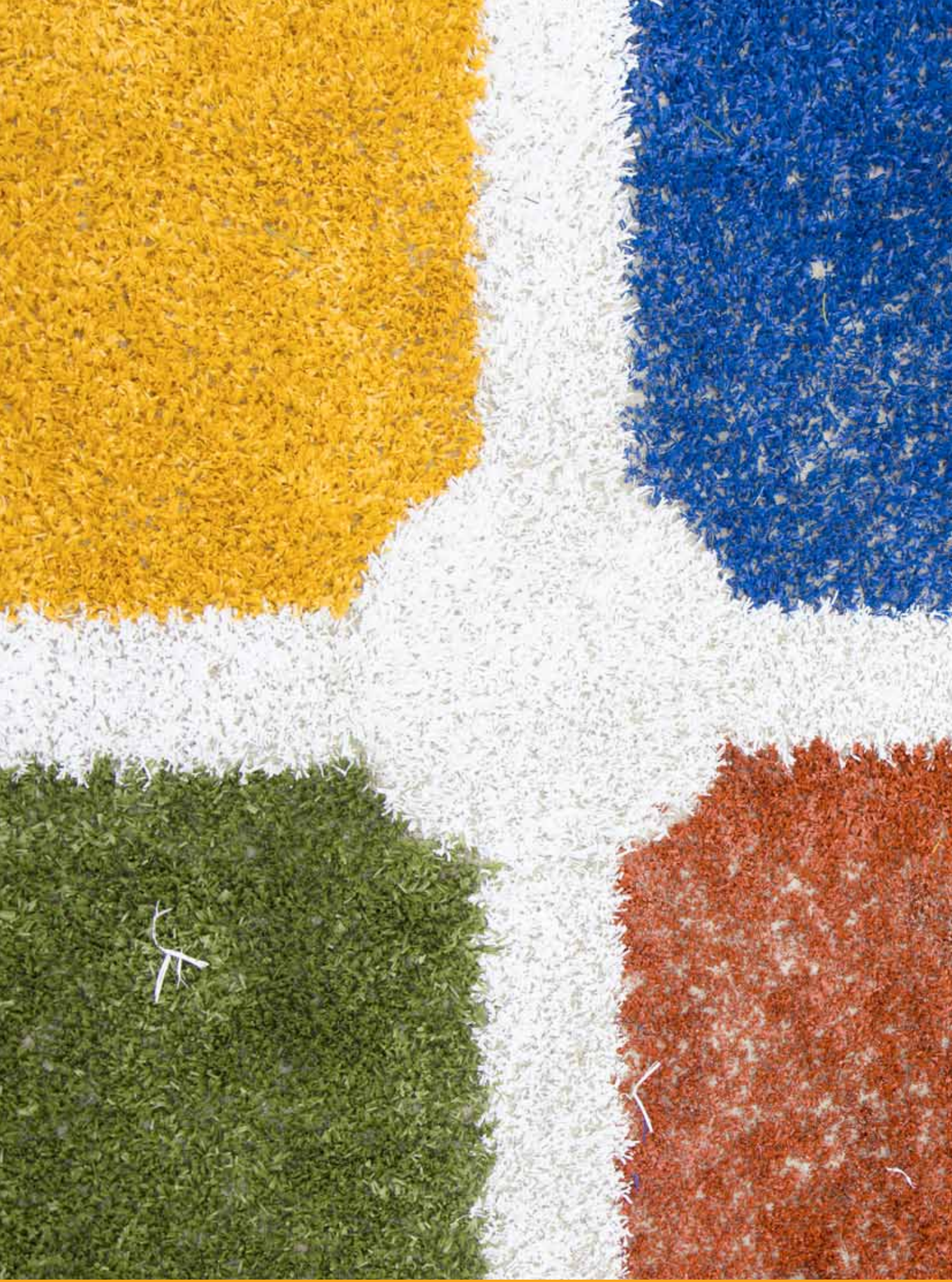
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Methodology & Data Sources

The Report Card⁺ is a report about the national performance regarding physical activity, sedentary and sleep behavior of youth with a chronic condition or disability¹. In 2016, the first Dutch Report Card for typically developing was published. The Report Card⁺ is a similar report, in which the same methods are used. The results of this Report Card⁺ can be compared to the results of the Report Card (see page 58), but this report stands alone as well.

This report is intended for (health care) professionals and policy makers. A general Dutch short form of Report Card⁺ is available as-well and available at:
www.activehealthykids.nl.

The principal investigator and project manager formed a research work group together with 7 researchers of the University Medical Centre Utrecht, Utrecht University, Utrecht University of Applied Sciences and Center of Excellence in Rehabilitation Medicine.

An expert group was formed with the involvement of National Institute for Public Health and Environment (RIVM), Mulier Institute, Dutch Olympic Committee* Dutch Sport Federation (NOC*NSF), Windesheim University of Applied Sciences, Knowledge Centre for Sports Netherlands (KCS), Hanze University of Applied Sciences Groningen, Amsterdam University of Applied Sciences, Institute for Health and Care Research, Netherlands Institute for health service research (NIVEL) and an advisory role for the Primary Education Board [PO-Raad]. (see pag 4)

Both the research group and the expert group were responsible for the interpretation and evaluation of the data sources and evidence and had to decide about definitions and benchmarks of the indicators for the grading and were responsible for the final grading. It was decided to add sleep behavior and weight status as additional indicators. The Active Healthy Kids Canada framework was applied.¹

For the evaluation of the indicators, data of the period 2011 up to 2015 has been included. When available, we used data from national surveys conducted by Statistics Netherlands (CBS) and the National Institute for Public Health and Environment (RIVM) as the primary source. This monitor divides youth in two age groups: 4-11 years and 12-17 years. As a consequence of this, the indicators assessed both age groups.

The situation of scholars attending special education was described when reports from the Mulier Institute were available.

Grades were based on examination of the current data and literature for each indicator against a benchmark (see summary of indicators & grades) or optimal scenario, assessing the indicator to be poor, adequate, good or excellent:

Grades

- A** = The Netherlands is succeeding with a large majority with a **large majority** (81-100%) of children and youth.
- B** = The Netherlands is succeeding with **well over half** (61-80%) of children and youth.
- C** = The Netherlands is succeeding with **about half** (41-60%) of children and youth.
- D** = The Netherlands is succeeding with **less than half** (21-40%), but some, children and youth.
- F** = The Netherlands is succeeding with **very few** (0-20%) children and youth.
- INC** = **Incomplete. Not enough available evidence** to assign a grade to the indicator or absence of clear well-established criteria.
- = % Scholars in special schools meeting the norms or establish criteria, is **lower than among the general youth with a disability**.

Some indicators are stand-alone, while others are comprised of several components (see summary of indicators & grades).

Table 1 gives an overview of the primary data sources used to inform the grades assigned to each indicator and describes specific survey characteristics.

¹Youth with a disability: all children and adolescents with a chronic condition or disability, both physical as mental.

Name of survey and institution	Survey description	Year/s data collected, concerning Report Card	Sampling method	
Lifestyle Monitor: Physical Activity and Accidents, RIVM, VeiligheidNL, CBS ²	Detailed information on several lifestyles themes including physical activity behavior are gathered annually: Active transport, Physical activity at school/work, Leisure time activities, Sport participation, Body weight, Health/disease status or biannually: sedentary behavior	2015 * 2011 till 2014 sample sizes too small	Annually Sample size from Basic Person Registration spread over the year	

	N	Ages	Indicators informed	Survey Questions /components related to indicators
	4-11 years, n = 142 12-17 years, n= 232	4-17 years > 4-11 years parent report	1 2 3 4 5 6 7 9	<p>General health</p> <p>> <i>Does your child has one or more prolonged diseases or disorders? (Prolonged is (expected) 6 months or longer.</i></p> <p>Height & Weight</p> <p>> <i>What is the height of your child? It concerns the height in centimeters, without clothing.</i></p> <p>> <i>What is the weight of your child? Is concerns the weight in kilos.</i></p> <p>Physical activity behavior</p> <p>> <i>Consider a normal week in the past months. Could you indicate how many days per week your child participated in these activities and how much time on average you were engaged in these activities?</i></p> <ul style="list-style-type: none"> ▪ Walking to/from school or work <i>Days, hours, minutes</i> ▪ Cycling to/from school or work <i>Days, hours, minutes</i> ▪ Active play at school (school care is not included here. It concerns activities as jumping rope, skateboarding, games of running, climbing on climb frame) <i>Days, hours, minutes</i> ▪ Walking in leisure time <i>Days, hours, minutes</i> ▪ Cycling in leisure time (cycling to/from school is not included here. Sitting back up is not included). <i>Days, hours, minutes</i> ▪ Active play in leisure time (school care is included here. It concerns activities as jumping rope, skateboarding, games of running, climbing on climb frame Swim lessons (school swimming is not included here) <i>Days, hours, minutes</i> <p>Sports participation</p> <p>> <i>In which sports is your child/are you engaged?</i></p> <p><i>How many days per week are you/ is your child engaged in [selected sports]?</i></p> <p>> <i>How much time on average are you engaged/is your child engaged in in that sport [selected sport]?</i></p> <p>> <i>How many weeks per year are you/ is your child engaged in that sport [selected sport]?</i></p> <p>Sedentary behavior</p> <p>> <i>Consider a normal week in the past months. Could you indicate how much time your kind is sitting in the next situations on an average school day and on an average weekend day?</i></p> <ul style="list-style-type: none"> ▪ Sitting during transport (during transport, as sitting in a car, bus or train, but not cycling. Make a summation of the outward as the return) ▪ Sitting during work (for example sitting in front of a bureau, computer or using a tablet at work or at home) ▪ Sitting during school/study. (For example during the class or while making homework at school/home) ▪ Watching television ▪ Using a computer or tablet at home (for e-mail, computer games, searching for information or chat, but not related to school or work) ▪ Other sitting leisure time activities (for example chatting, eating, playing a music instrument, visiting the cinema etc.) <p>> <i>Consider a normal week in the past months. Could you indicate how much time your kind is lying in the next situations on an average school day and on an average weekend day?</i></p> <ul style="list-style-type: none"> ▪ Taking a nap in-between (for example lying on bed/couch) <i>Hours, minutes</i> ▪ Lying for sleep for the night rest <i>Hours, minutes</i>

Table 1. Overview of primary data sources (1/3).

<p>Mulier Institute</p> <p>(Un)limited Sportive 2013 [(On) beperkt Sportief]³</p>				
<p>Mulier Institute</p> <p>Monitor Special Heroes in Cluster IV - Final situation of the participating cluster IV schools and their scholars, 2013⁴</p>	<p>Monitor and evaluation of the program Special Heroes for the pilot in Cluster IV schools</p>	<p>2011 2013</p>	<p>Two times (2011 & 2013)</p>	

<p><i>Scholars questionnaire</i> Cluster I, n= 239 Cluster II, n=725 Cluster III, n=2867 Cluster IV, n=1161</p> <p><i>Schools questionnaire</i> Cluster I, n = 3 Cluster II, n=8 Cluster III, n=83 Cluster IV, n=32</p>	<p>Age related to special education</p>	<p>1 2 3 4 7 9</p>	<p>For questions related to indicator 9, see description monitor cluster IV</p> <p>Transport to school</p> <ul style="list-style-type: none"> ▪ Not applicable, resides intern ▪ Walking ▪ (Tandem) cycling ▪ Transport operator (taxi) ▪ Public transport ▪ Transport by parents <p>Numbers of hours physical activity per week, excluding sports</p> <ul style="list-style-type: none"> ▪ 0-2 hours ▪ 2-4 hours ▪ 4-8 hours ▪ ≥ 8 hours <p>Number of times playing outside</p> <ul style="list-style-type: none"> ▪ Less/no ▪ 1-3 times/month ▪ 1-4 times/week ▪ 5-7 times/week <p>Frequency of sports participation outside school in the past 12 months</p> <ul style="list-style-type: none"> ▪ None (0 times) ▪ 1-11 (< 1 times/month) ▪ 12-59 (< 1 times/week) ▪ 60-119 (1-2 times/week) ▪ > 120 (> 2 times/week) <p>General data</p> <ul style="list-style-type: none"> ▪ BMI
<p>n = 618</p>	<p>Age related to special education</p>	<p>1 2 3 4 7 9</p>	<p>PE lessons</p> <ul style="list-style-type: none"> ▪ Sports and exercise offers during PE lessons ▪ Number of PE lessons per week and durations in minutes per week ▪ Presence PE specialist ▪ Possibilities to play sports or exercise during recess <p>Sports offer outside school hours</p> <ul style="list-style-type: none"> ▪ Offer of sports and exercise activities after school hours' ▪ Type of offer ▪ Who is involved in the (organization) of the sports offer after school ▪ Collaborations with other organizations for this extra offer <p>Sports and exercise activities</p> <p><i>Numbers of hours physical activity per week, excluding sports</i></p> <ul style="list-style-type: none"> ▪ 0-2 hours ▪ 2-4 hours ▪ 4-8 hours ▪ ≥ 8 hours <p><i>Frequency of sports participation outside school in the past 12 months</i></p> <ul style="list-style-type: none"> ▪ None (0 times) ▪ 1-11 (< 1 times/month) ▪ 12-59 (< 1 times/week) ▪ 60-119 (1-2 times/week) ▪ > 120 (> 2 times/week) <p><i>Transport to school</i></p> <ul style="list-style-type: none"> ▪ Not applicable, resides intern ▪ Walking ▪ (Tandem) cycling ▪ Transport operator (taxi) ▪ Public transport ▪ Transport by parents <p>General data</p> <ul style="list-style-type: none"> ▪ BMI

Table 1. Overview of primary data sources (2/3).

Mulier Institute Monitor Special Heroes in cluster III – Final situation of the participating cluster III schools and their scholars, 2013 ⁵	Monitor and evaluation of the program Special Heroes for the pilot in Cluster III schools	2012	Twice (2007 & 2012)	
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Explanatory Note – Special Education

In the Netherlands, children with a disability can attend regular education, but there are children who attend special education at special schools. In this Report Card⁺, we included the situations of the several indications in special schools.

Special primary education

When a regular primary school is not able to support a child with learning problems, a child can attend a special primary school. These schools have similar aims as regular schools, but the children have more time to achieve the aims. Till the age of 14, these children can attend special primary schools. These schools are intended for:

- children with learning disabilities
- children with educational difficulties
- children with behavioral problems.⁶

Special education and special secondary education

Special education is developed for children with a physical and/or mental handicap and for children with chronic illness or disease who need specialist or intensive supervision. This additional attention and support can be attained at special schools. Scholars in special schools, usually go to secondary special schools at the age of 12. Secondary special schools have the same cluster division as special schools. [4]

Four clusters are present:

Cluster I: Schools for visually impaired children or children with multiple disabilities who are visually impaired or blind. Most scholars go, with special supervision, to regular schools. The remainders attend special schools.	Cluster II: Schools for deaf children and hearing impaired children, children with speech or language difficulties and children with communicative problems, as with some forms of autism.
Cluster III: Schools for children with motor and/or mental disabilities, chronically ill children and children with epilepsy.	Cluster IV: Schools for children with psychiatric disorders or severe behavioral problems and schools that are related to pedagogical institutes. ⁴

Scholars, n= 2867 Parents, n= 1 145 Schools, n = 34	Age related to special education	1 2 3 4 7 8 9 10	For questions related to indicators 1,2,3,4,7,9 see description monitor cluster IV Reasons to not or engage little in sports (reported by parents) ▪ Child does not want to/has no time ▪ Unfamiliarity of sports possibilities ▪ Too expensive ▪ Child exercises a sufficient amount already ▪ Health child ▪ No transport available ▪ No time themselves/ energy to help ▪ Too little (voluntary) help ▪ Negative experiences of child ▪ Other
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Legend table 1

- Overall Physical Activity Levels
- Organized Sport Participation
- Active Play
- Active Transportation
- Sedentary Behaviors
- Sleep
- Weight Status
- Family and Peers
- School
- Community and the Built Environment
- (Non-) Government strategies and investments

Table 1. Overview of primary data sources (3/3).



Indicators & Grades

A total of 11 indicators were included for the 2017 Active Healthy Kids the Netherlands Report Card⁺. These indicators were grouped in three categories (see figure 1):

Strategies and investment (Government and Non-Government), Settings & Sources of Influence (Family & Peers, School and Community & Built Environment) and the Behaviors that Contribute to Overall Physical Activity Levels (Overall Physical Activity, Organized Sport Participation, Active Play, Active Transport, Sedentary Behavior and Sleep).

Weight status was included as an indicator as well. As this is more of a health outcome rather than a health behavior, this indicator was separately grouped.

The outcome of the indicators gives an overview over the physical activity behaviors of the youth with a disability in the Netherlands and how the Netherlands supports this behavior in different settings of influence.



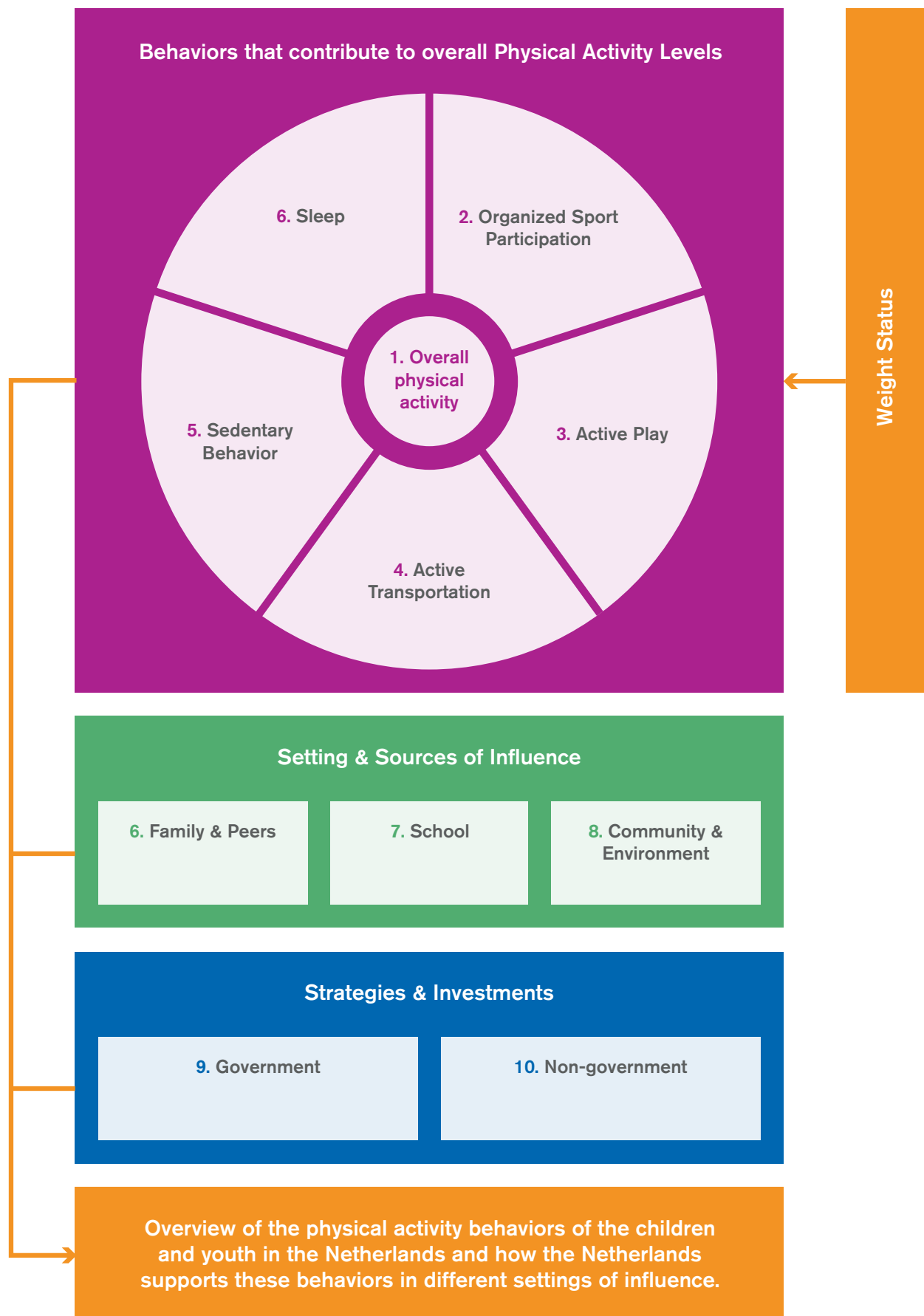


Figure 1. Overview categories and related indicators

Why is physical activity important?

According to the World Health Organization (WHO) physical inactivity is the fourth leading risk factor for mortality (after a raised blood pressure, tobacco use and raised blood sugars). Regular physical activity reduces the risk of cardiovascular disease, diabetes, breast and colon cancer, and depression.⁷ Noting that the more physically active the child the greater the health benefit, specific research showed that physical activity has positive effects on musculoskeletal health, cardiovascular health and mental health.⁸ It has been indicated as well, that the earlier in life one starts engaging in sports and exercise, the longer one benefits from it⁹. Therefore, physical activity is important, also for children with a disability*.

It is plausible that a part of the children with a disability is or can be less physically active, but that it is especially important for this group of children to engage in sports and exercise, because of the positive health effects in the physical, mental and social domain. Because of barriers, this group should perhaps be more stimulated and encouraged for an active lifestyle in a broad sense: from physical activity during sports- and play activities and reducing or interrupting sedentary behavior, to behavior related to sleep and weight/nutrition. Studies among children with a disability indicated that physical activity could result in a higher quality of life (QoL), higher levels of functional independence and a better physical, social and mental health.¹⁰⁻¹³

The relevance of a healthy body weight and the negative consequences of an unhealthy weight on health and exercise are raised in awareness. Data showed that both overweight and obesity are more prevalent among chronically ill children, compared to their healthy peers.¹⁴⁻¹⁷ It seems highly plausible that a higher body weight makes physical activity and playing sports less easy, which then results in higher levels of inactivity.

Furthermore, both sleeping behavior and the direct relation of sleep on a healthy development receive more attention as well. Insufficient sleep time could lead to less energy, which can result in less motivation to be physically active and higher levels of sedentary time. As a result the consequences (for physical activity behavior and weight) can stack up.

In the Netherlands, there is no overview yet of the actual status of physical activity behavior, sleeping behavior and weight status for youth with a disability. Regarding the proven and potential positive effects of exercise for a good health, we, of *Active Healthy Kids the Netherlands*, consider it useful to fulfill in this gap.

*Youth with a disability: all children and adolescents with a chronic condition or disability, both physical as mental.





Friendship Sports Centre

How (un) limited are the possibilities for the Dutch youth with a chronic condition or disability to be physically active?

All behaviors concerning physical activity are influenced by environmental factors and settings such as school, family, peers and the built environment (spatial design, playgrounds and nature). In addition, the policy of the national and regional government is of great influence as well.

Over the past few years, things have changed for the better to facilitate the sports and exercise behaviors of people with a disability. What about governmental policy, particularly for youth with a disability? Is there a special policy?

Several special projects, of which some were initiated and funded by the government, were developed to improve physical activity and sports participation among people with a disability. How effective were these projects? Did these projects caused a change for the children with a disability?

Meanwhile, more sports clubs and societies provide a special offer for people with a disability. But what is the status of social acceptance and accessibility at these clubs and societies? Do disabled people feel less restricted in the opportunities they have to participate in sports?

With this Report Card⁺, we hope to find an answer regarding these questions and finally, we hope to give an answer to the question 'how (un)limited are the possibilities for the Dutch youth with a disability to be physical active?'

A large, bold, orange letter 'D' is positioned in the top left corner of the page. The background of the entire page is a photograph of two young girls with blonde hair, wearing orange and blue striped tank tops, cheering with their arms raised in the air. The girl in the foreground is more prominent, showing her mouth open in a shout.

Overall Physical Activity

Grading

Benchmark: % Of children and youth with a disability who meet physical activity guidelines (NNGB*)

*NNGB: Dutch Physical Activity Guidelines [Nederlandse Norm Gezond Bewegen]; to be at least moderate active (from 5 MET) for at least 60 minutes every day.

Overall Grade 2011 till 2015

	Age Group	Percentage	Grade
	4 -11 years	26%	D
	12-17 years	26%	D
Mean grade	4-17 years	26%	D

Key findings | Indicator Overall Physical Activity

Disabled children in general

- 26% of the 4-11 year old children met the Dutch guidelines for physical activity in 2015.²
- 26% of the 12-17 year old youth met the Dutch guidelines for physical activity in 2015.²

Scholars in Special Schools

- Scholars of cluster II schools are the most physically active compared to the other clusters. 35% of the cluster II scholars exercises 8 or more hours per week (excluding sports).³
- 21% of the of cluster I and III scholars exercise 8 or more hours per week (excluding sports), and in cluster IV 27% of the scholars exercises this often.³

Overall

- The results of the Health Behaviour in Schoolaged Children (HBSC) study (2013) showed that only 17.4% of the secondary school children (~12-16 years of age) with a disability met the physical activity guidelines.¹⁸
- The type of disability is logically of influence on physical activity levels and consequently influences meeting of the physical activity guidelines. Some examples of different types of disability/diseases are described below:
- In the study of Bos et al. (2016), in which the physical activity levels of children with juvenile idiopathic arthritis (JIA) were compared to controls, it was shown that only 4% of the children with JIA met the physical activity recommendations, compared to 16% of the control group. The results also showed that, the JIA group had 3.9 days a week in which they met the recommendation. This was higher (4.9 days) in the healthy control group.¹⁹
- In a randomized trial of van Wely et al. (2014), in which a physical activity stimulation program for children with Cerebral Palsy (CP) was assessed, the baseline measurements showed that only 4% of the children with CP (7-13 years old, GMF level I-III) met the physical activity norms.²⁰
- The study of Bloemen et al (2017), showed that children with Spina Bifida (SB) (5-18 years old), exercise more on a school day compared to weekend days. 54.3% of the children SB met the NNGB on a weekday, compared to only 31% during weekends.

Recommendations |

- Develop more effective and sustainable interventions to increase overall physical activity levels. A large group of the children with a disability does not sufficiently engage in at least moderate-to-vigorous activity daily.
- Search for strategies and possibilities to increase opportunities to be physically active in highly urbanized areas. It seems that youth is less active in these areas (see contributing factors and disparities).²
- Incorporate objective measures in future surveys and establish guidelines for standardization of measures.
- Make parents aware of the importance of physical activity for their children and their important role in the physical activity behavior. They should be more aware of the positive influence of playing together outdoors and exercise stimulating toys and the bad influence of high levels of sedentary and screen time and the consequences of a bad weight status.
- The group children with a disability is diverse, therefore it remains important to take the possibilities and wishes of the individual child into account.
- When physical activity behavior on a certain level cannot be adjusted, look for levels where improvements can be made.

Research Gaps

- As seen in the Report Card for typically developing children, the national data was only based on subjective measures. In addition, the measurements and methods of all other studies differ enormously. Different questionnaires are used, but also variations in accelerometers, pedometers and diaries are used. Research for standardization of these measures is needed, so outcomes of studies can be easily and well compared.
- It is not known if the guidelines for physical activity as well for sedentary behaviors for typically developing children are also the best for children with all kinds of diagnoses. For children who are wheelchair depended for example, this could be quite different.
- The national monitoring does not include children under the age of 4. It is also interesting and necessary

to know how physically active these youngsters are, especially children with a disability.

Literature synthesis

The importance of physical activity

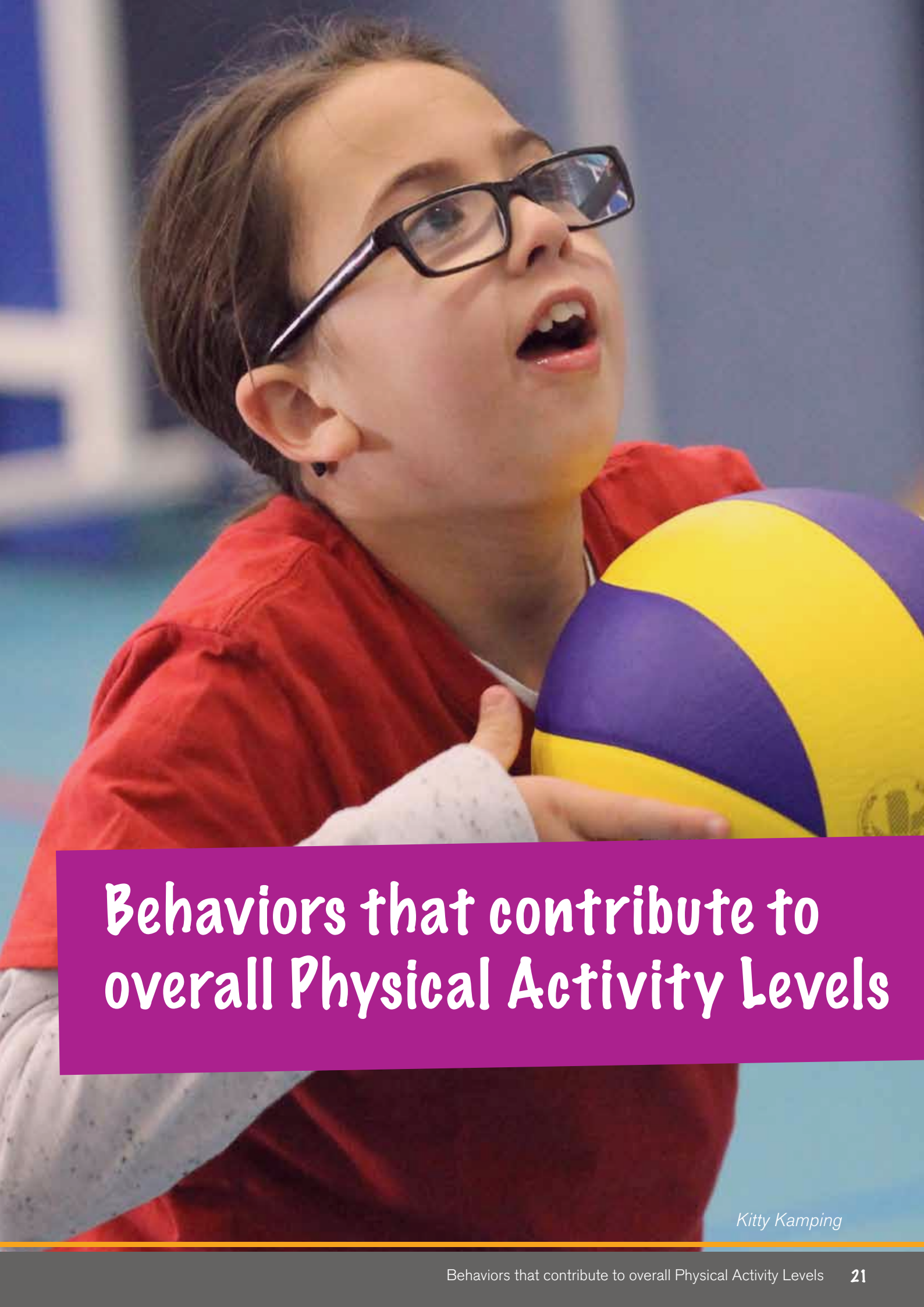
Children with a physical disability seem to be less active than typically developing children.³ Precisely these children need to be encouraged to have a physically active lifestyle, because of the benefits of physical activity. Some beneficial effects of physical activity are an increase of physical, emotional and social well being of children with disabilities. Furthermore, physical activity can increase their quality of life and functional independence.^{10,22} A variable that contributes to the level of physical activity is the level of self-efficacy. A higher level of confidence seems to be a positive factor for physical activity.^{10,22} Another variable that is mentioned in some studies is perceived encouragement from parents and family. In these studies they suggested that to increase physical activity, parents and family should focus on the solutions and possibilities instead of emphasizing on the difficulties.²²

Stimulation of physical activity

Children with a disability have to deal with different barriers before they can become physically active. In research on CP different barriers are identified. The physical characteristics of disabled children can be a barrier. Some children are unable to participate in certain physical activities. Furthermore, they have to deal with lack of energy, fatigue and lack of 'leisure' time besides regular activities. These factors decrease the possibility to be physical active after school. Another barrier is the parents' lack of knowledge. Some parents think that their child is unable to participate in sports activities and they are afraid that their child is vulnerable to injuries.²² For inactive children with a disability it can be useful to start physical activity in a therapeutic or highly supervised setting. This creates a safe and familiar surrounding where the children gain strength, fitness and self-confidence. Such a program would make it easier for these children to become physical active on their own.²³ In the study of Kotte et al. (2014)²⁴, the effects of the Fitkids exercise program were investigated. Fitkids is a Dutch exercise program, especially designed for children and adolescents who are 6 to 18 years of age and have a chronic condition or disability. The purpose of this program is to help these children become more active and to promote health-related fitness and health-related quality of life, by improving physical literacy. The results showed that the Fitkids exercise therapy program significantly improved health-related fitness, walking capacity and the health-related fitness and health-related quality of life.⁴

Contributing factors and disparities

- **Gender:** Boys in cluster III schools are more physically active than girls in these schools.⁵ However, boys in cluster IV schools are less active than girls in cluster IV.⁴ Gender differences in the national monitoring data of the RIVM were also present. In the younger age group (4-11 years old), more girls met the Dutch physical activity guidelines compared to boys (29% versus 23%). Remarkably, this changed in the older children (12-17 years old). In this age group, 20% of the girls met the NNGB compared to 32% of the boys.²
- **Age:** Children in the age group of 6-12 years with a mental and/or motor disability, visual disability or auditory problems are more physically active than older children (16-19 years).³ A possible reason why these children are less physically active is because they become more independent. Although they still receive support from others, they reported more frequently personal factors, like attitude and self-efficacy, as a barrier for physical activity.¹⁰
- **Degree of urbanization:** In both age groups, children and youth living in less urban areas met the NNGB more often compared to children in more urbanized areas (12-17 years old less urban 25% versus 22% more urban; 4-11 years old less urban 29% versus 21% more urban).²
- **Education level of parents:** The parental level of education seems to play a role in the child's level of physical activity. A possible reason, why parental level of education seems to be important, is that people with a higher level of education are generally more aware of the health benefits of physical activity. Furthermore, parents with a higher level of education will probably have more resources to access modified facilities.²⁵



Behaviors that contribute to overall Physical Activity Levels

Kitty Kamping



Organized Sport Participation

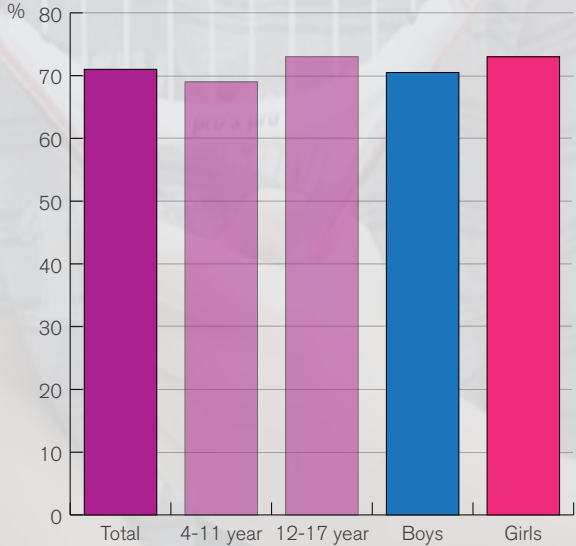
Grading

Benchmark: % Of children and youth with a disability who participate in organized sport and/or physical activity programs weekly.

Overall Grade 2011 till 2015

	Age Group	Percentage	Grade
	4 -11 years	69%	B
	12-17 years	73%	B
Mean grade	4-17 years	71%	B

Weekly Athlete



Grading

Key findings | Indicator Organized Sport Participation

Disabled children in general

- 69% of the 4-11 year old children with a disability is considered a weekly athlete.²
- 73% of the 12-17 year olds with a disability is considered a weekly athlete.²

Scholars in Special Schools

The percentage of children that is a member of a sports club is comparable in the different clusters.

- 41% of the children who attend a cluster I school is a member of a sports club and 25% of the scholars play sports at least once a week outside of school.
- 49% of the children who attend a cluster II school is a member of a sports club and 37% of the scholars play sports at least once a week outside of school.
- 50% of the children who attend a cluster III school is a member of a sports club and 26% of the scholars play sports at least once a week outside of school.
- 43% of the children who attend a cluster IV school is a member of a sports club and 45% of the scholars play sports at least once a week outside of school.³

Recommendations |

- Remove unnecessary (practical) barriers for disabled children who want to participate in sports activities. Almost a third of the children who attend a special school has the wish to play sports, but is not participating in a sport.³ This group is motivated to play sports, so it is unfortunate that they are not participating in sports because of practical reasons or because of unfamiliarity with the possibilities. It is therefore important to remove these barriers and to show clearly what the possibilities are for disabled children to participate in (organized) sports.
- Develop more programs like Special Heroes that stimulate sport participation in disabled children. Programs like this seem to be effective. Besides that, it is essential that there is a good connection between such programs and the existing sports offer, to make sure that children who want to continue sports after participating in a program like Special Heroes have the opportunity to do so.^{26,27}
- Search for possibilities to support parents to bring their children to a sports club. (Special) schools could organize more sports activities for children with a disability. Organizing sports at school could remove for example transportation as a barrier for children and their parents to be engaged in sports activities. Being dependent on others, is one of the reasons being mentioned for not participating in sports.²⁸
- Encourage health care professionals (general practitioners, pediatricians, rehabilitation specialists, physical therapists, etc.) to discuss the importance of sports and exercise and to guide the children and their parents in the right direction. Preferably, this occurs already at an early age of the child. A good example is WKZ Sportive [WKZ Sportief], which provides parents and children several routes to become engaged in sports. See the website: <http://www.hetwzk.nl/nl/Ziekenhuis/Afdelingen/Kinderbewegingscentrum/WKZ-Sportief>
- Many sports federations have a special offer for people or children with a disability; see the website www.noc*nsf.nl/aangepastsporten.
- At the website of Unique Sports [Uniek Sporten], the sports and exercise offer in the regions can be found: <https://uniekporten.nl/home>.

Research Gaps

- More research is needed on the physical activity intensity levels during sports activities. As mentioned in the report card for typically developing children, being a member of a sports club does not necessarily mean that the child actively participates in sports. This might explain the discrepancies in the data from cluster schools between the percentages of sports memberships and the percentages of children who are engaged in sports at least once a week. However, this difference is likely to be also influenced by the fact that, in the survey, they had the option to say they play sports 12 – 59 times a year (less than once a week). Many children who play sports once a week possibly chose this option.³

Literature synthesis

Participation in organized sport activities

Participating in sport activities has many benefits for children with a disability. One of these benefits is the increase in health and physical fitness and a decrease in secondary conditions such as obesity.²⁸ Some studies have reported the benefits of organized sport participation in perspective of the child. For example, in the study of van Lindert et al. (2013)⁴ the possible reasons why children with behavioral problems participate in organized sport activities were investigated. The main reason to participate in sport activities is pleasure/relaxation (80% reported this reason). On the other hand, social contact with other children is a reason to participate in sport (50% reported this reason). Furthermore, health reasons and to get rid of aggression are mentioned as stimulating factors.⁴

Motives for not participating in organized sport activities

Children with a disability participate less in organized sport activities than typically developing children. In multiple studies, which focused on children who attend schools for special education with a mental and/or motor disability, visual disability, auditory problems or behavior problems, a questionnaire was used to find out why these children participate less. The main personal reasons why children do not participate in organized sport activities are lack of time and willingness. Other than that, negative experiences, unfamiliarity with sport possibilities or that the child is already physically active are mentioned as reasons for not participating in sport activities. Not only personal factors were investigated but also environmental factors. The most important environmental reason for not participating is the expenses. According to their representatives, the most important personal reason for not participating for people with a mental disability is that they cannot take part in sports activities because of physical limitations. Surprisingly, this reason was reported slightly more often in 2012 than in 2008. Some suggestions they reported of which they consider that participation will be easier for people with a mental disability, were more volunteers, better supervision, better motivation of participants and better integration in regular sports clubs.³ To stimulate sport participation among children with a disability, especially children in the special education system, the government ordered a program, named "Special Heroes", that ran between 2009 and 2015. The main goals of the program were to embed physical activity and sport in schools from the special education system and stimulate children with a physical disability or mental disease to participate in sport activities.^{26,28} Evaluation of the program showed a 12%-16% increase of structural physical activity and organized sport participation of children with a disability. After the Special Heroes program ended, a 3% decrease (from 34% to 31%) in non-participating children was found. So the program appears to be effective. More information about the Special Heroes program can be found at the indicator 'Government and non-government strategies and investments'.^{5,29}

Contributing Factors and Disparities

- **Gender:** No great differences were found between boys and girls in both age groups in percentages of children who play sports weekly (69% for 4-11 year olds and 73% for 12-17 year olds).²
- **Age:** Children with a physical disability or mental disease at the age of 6 to 9 years participate less in organized sport activities compared to older children. A possible reason why these children participate less in organized sport activities, is because parents have a lot to regulate regarding the special needs of their child, so sport is not a priority.⁵
- **Degree of urbanization:** Children who live in more rural areas are slightly more often rated as a weekly athlete (73% of the 4-11 year olds and 77% of the 12-17 year olds) than children from (highly) urban areas (65% of the 4-11 year olds and 69% of the 12-17 year olds).²
- **Type of disability:** as seen in the findings of cluster scholars and being a weekly athlete, but as well data regarding sports participation once a year showed that the type of disability is of influence on the sports participation. 66% of the children with a mental and/or motor disability participates in sports once a year. This percentage is comparable to the sport participation of children with a visual disability (70%), children with auditory problems (73%) and children with behavior problems. Overall, the sport participation of children with a disability in special education is lower than children without a disability at regular schools (84%) (5-14 years).³ A possible explanation for a lower sport participation could be the lack of sports facilities. This is mentioned as a barrier by children with a disability and their parents.²⁸
- **Transportation:** The logistical problems with transportation were also noted as a barrier.²⁸

C

Active Play

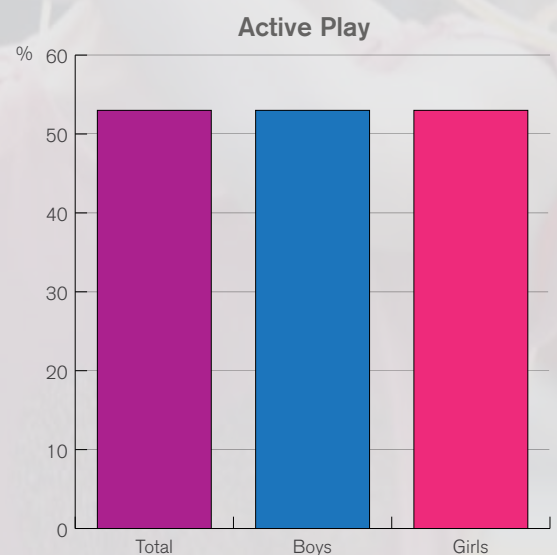
Grading

Benchmark: % Of children and youth with a disability who participate in organized sport and/or physical activity programs weekly.

Average Grade 2011 till 2015

	Age Group	Percentage	Grade
	4 -11 years	53%	C
	12-17 years	-	INC
Mean grade	4-11 years	53%	C

Note: the RIVM monitor does not include questions about active play behavior in 12-17 year old youth.



Key findings | Indicator Active Play

Disabled children in general

- 53% of the 4-11 year old children with a disability played outside for at least 60 minutes after school time, on all days of the week.²

Children in special schools

- Scholars of cluster II schools most often play 5-7 times per week outside (45%), compared to cluster I (31%), III (30%) and IV (33%) scholars.³

Overall findings

- The average amount of minutes of active playtime outside school hours was 529 minutes per week for the 4-11 year old children with a disability.³

Recommendations |

- More research about the active play behaviors in children with disabilities is needed. When insights are increased, studies should focus on effective interventions to increase the active play behaviors of these children.
- Inform, stimulate and motivate parents that their role and attitude is essential in the active play behavior of their child. For example, advise parents to balance between scheduled activities and leisure time for active play. Parents could provide solutions or intervene when playing together is stalled, so children with a disability can play together with other children with and without a disability.
- At the website of the Playground Gang [Speeltuinbende], an overview of accessible playgrounds in the neighborhood and play area's where children (with and without a disability) can play together, is present. See <https://www.speeltuinbende.nl>

Research Gaps

- No evidence based definition and consequently no clear cut off points for active play are present.
- No information is present about the intensity levels during active play activities of the Dutch children with a disability. If it seems that, as in typically developing children, a high amount of MVPA is reached during active play, the importance and possibilities for active play for this target group should be emphasized. It could be however, that for some children with special and complex disabilities, the possibilities for active play are so restricted that active play contributes only for a small part to the overall physical activity levels.
- Little is known about interventions that aim to increase the playing behaviors of children with a disability. Research in children with all sorts of disabilities is present, but the main focus areas are often overall physical activity levels, sports participation and/or sedentary behaviors. Active play is a little neglected in these target groups.

Literature synthesis

It is known that engaging in active play and leisure activities is important for the overall development of children. It influences social, intellectual, emotional, communicative and motor skills and without opportunities to participate in leisure activities, children are less able to grow as an individual. In addition, it was suggested that participation in active play and leisure activities contributes to the quality of life of youth.³⁰ For example, in children with neurodevelopmental disabilities a relationship between participation in leisure and different domains of quality of life was found.

For children with a disability, it is assumed that they do

participate less in leisure activities compared to typically developing children. Moreover, the setting of the activities is often more home-based and organized by their parents.³⁰ Qualitative studies have shown that children with a disability consider engaging in play and leisure activities as highly important. For instance, research in youth with CP and their parents showed that participation in chosen and enjoyable activities has a positive impact on levels of well being and a positive relation between active physical activities and physical wellbeing was found.³⁰ Thus, participating in active play is important for reaching levels of physical activity, for the development of a broad

spectrum of skills as well, and it seems that it influences quality of life.

Contributing factors and disparities

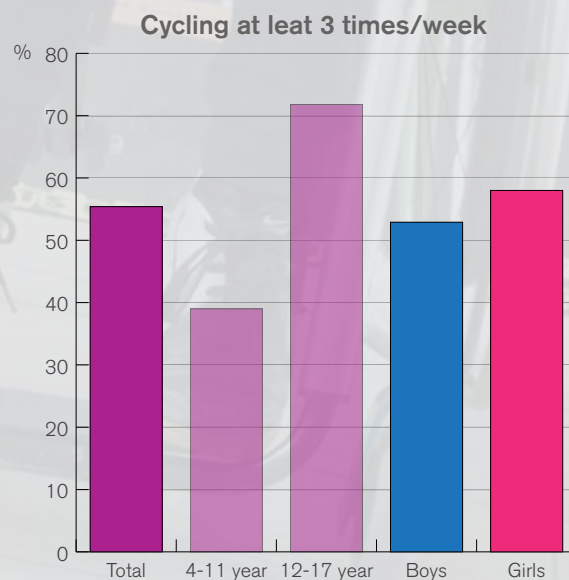
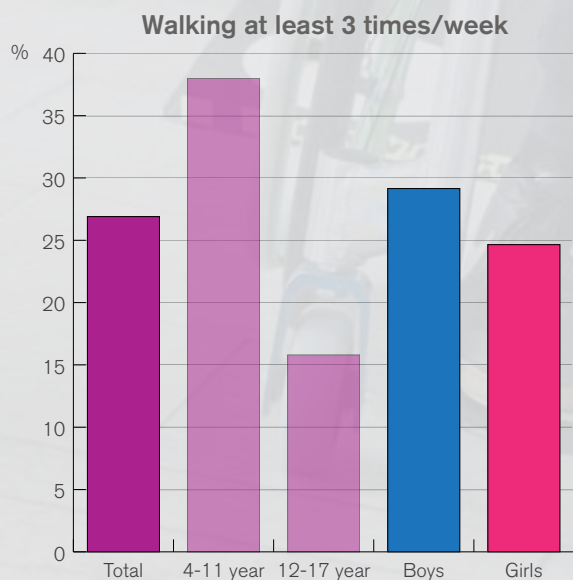
- **Gender:** No differences between boys and girls were found in reaching at least 60 minutes of active play per week, boys however played a little more outside regarding minutes per week (537 minutes versus 519 minutes).² In the review of Bult et al. (2011) about leisure time activities, gender differences were present but were dependent on the type of the investigated activities. As observed in typically developing children, boys prefer the more physical activities and girls like the more social and spontaneous activities.³⁰ For the girls with a disability, it is imaginable that there are fewer possibilities to find suitable and enjoyable activities to do outdoors.
- **Age:** The review of Bult et al. (2011) showed that, as seen in typically developing children, the older children with CP, SCI and groups of children with several diagnoses, engage less in leisure activities.³⁰
- **Degree of urbanization:** Children (4-11 years old) living in less urbanized areas played more often and longer outside, compared to children living in more (highly) urbanized areas (591 minutes per week versus 449 minutes per week & 56% versus 48% of 60 minutes per day for 7 days respectively).²
- **Type of disability:** Logically the type and complexity of the disability influences the levels of engagement in active play. In monitors of children in special schools, it was shown that children with visual disabilities are the ones playing the least in play activities outside (answer option 'almost never – never' 26%). For the children with an auditory disability this is less often a problem (12%). Children of the other clusters schools are in between these percentages.³ Visually impaired children are limited in their freedom of movement. A quarter of the children with a visual disability has motor impairments as well. It is plausible that, because of that they engage in outdoor play activities less often compared to typically developing children.³
- **Parental aspects:** the review of Bult et al. (2011) also showed that in research evaluating the child's direct environment regarding play activities and leisure time, Caucasian ethnicity of the parent, low parental education levels, lower parental physical functioning and higher levels of parental stress were associated with lower participation of the children. Further, an association was found between the level of participation of the child on the one hand and the participation of the family in leisure activities and the degree of interest in cultural and social activities on the other hand.³⁰ In the study of Pratt et al. (2016), in children with CP, it was mentioned that a family's recreation preferences support similar participation for their children.³¹
- **Environmental factors:** in the study of Pratt et al (2016), it was shown that children with CP who played at playgrounds that meet the Americans with Disability Act (ADA) guidelines, are more active at these playgrounds compared to non-ADA playgrounds.³¹

A

Active Transportation

Grading

Benchmark: % Of children and youth with a disability who use active transportation (walking & cycling) to get to and from places (school, park, friend's place) for at least three days a week.



Average Grade 2011 till 2015

	Age Group	Percentage	Grade
	4 - 11 years	77%	B
	12-17 years	87.6%	A
Mean grade	4-17 years	82.3%	A

Key findings | Indicator Active Transportation

Disabled children in general

- 39% of the 4-11 year old children cycled 3 or more days to or from school or work.²
- 38% of the 4-11 year old children walked 3 or more days to or from school or work.²
- 71,8% of the 12-17 year old children cycled 3 or more days to or from school or work.²
- 15,8% of the 12-17 year old children walked 3 or more days to or from school or work.²

Scholars in Special Schools

- Only 4% of the children in cluster I schools used active transportation to get to their school.³
- 18% of the children in cluster II schools used active transportation.³
- 13% of the children in cluster III schools used active transportation.^{3,5}
- Children of cluster IV schools were most active regarding active transport, namely 30% (average of 2 measures) uses active transportation.^{3,4}

Overall Findings

Disabled children in general

- The younger children (4-11 years of age) walk on average 28 minutes per week, compared to 26 minutes for the older children (12-17 years of age).^[2]
- The younger children (4-11 years of age) cycle on average 38 minutes per week, compared to 205 minutes per week for the older age group (12-17 years of age).²

Recommendations |

- Explore the possibilities to increase the active transport for these children. For example, possibilities to decrease the distances to the special schools. Initiatives, in which even a part of the trip is active, could have positive effects on the overall physical activity levels of the children. An example is cycling to a central meeting point, from where group transportation is arranged.
- Investigate in possibilities of multi-sectorial collaborations to develop other possibilities to improve the active transport possibilities.
- Stimulate active transport to other destinations next to school.

Research Gaps

- As mentioned in the Report Card for typically developing children, there is little information about the active transport behavior of the Dutch children³², both in typically developing and in children with a disability, during leisure time and weekend days. In addition, other modes of transportation (inline-skating, skate boarding, long –boarding) are not included yet in the current used monitor. Future research should focus on these other transport goals, moments and transport modes.
- More research is needed on how to increase the independent mobility for those children who can ride a bike or walk but their distances to school are too large.

Literature synthesis

- As seen in the Dutch Report Card for typically developing children, active transportation is of high importance for achieving high levels of (moderate-to-vigorous) physical activity. Most children in regular school do use active transportation to go to school. For children with a disability however, this is not that common. Many special schools have a regional function and distances from the home of the students to the special schools are larger than in the regular school situations. Because of these larger distances, children

have to travel by special transport. In the study of von Heijden et al. (2013)³ regarding data of special schools, it was found that 85% of children with a visual disability, 71% of children with auditory problems and 78% of children with mental and/or motor disability go to school by taxi. This percentage is lower for children with behavior problems (43%).³ Thus, for a large amount of the disabled children, it is a lot harder to reach their recommended daily (moderate-to-vigorous) physical activity from active transportation.

Contributing factors and disparities

- **Gender:** For the active transport behaviors, no great differences were found between genders (boys 4-17 cycling at least 3 times/week 53% versus 58% girls, boys 4-17 walking at least 3 times/week 29% versus girls 25%).²
- **Age:** the older children (12-17 years old) cycle or walk to school more often than the younger (4-11 years old) children with a disability (87.6% versus 77% respectively).² It is plausible that this difference is because of the older children attend secondary education and these schools are in general further by than primary schools. In addition, it is plausible that some of the younger children are still brought by their parents.
- **Degree of urbanization:** For both younger and older children (4-11 age group and 12-17 year age group), it was shown that children from (highly) urbanized areas walk more often to school than children from more rural areas (4-11 year: 41% urban areas versus. 36% rural areas; 12-17 years: 18,3% versus. 13,3%). Interestingly, for cycling children from (highly) urban areas cycle less often than children from more rural areas (4-11 year 36% urban areas versus. 41% rural areas, 12-17 years, 61,9% versus. 82,1%).²
- **Type of disability:** There seems to be a difference in cycling and walking behavior to school with regard to the type of disability. 28% of the children with behavioral problems cycles or walks to school on their own. Though, for children with auditory problems (18%), children with a mental and/or motor disability (14%) and children with a visual disability (4%) this is percentage lower.^{3,33}
- **Locations of the schools:** As mentioned earlier, the locations and consequently the distances of the special schools result in more students who cannot use active transport to go to school.³

C

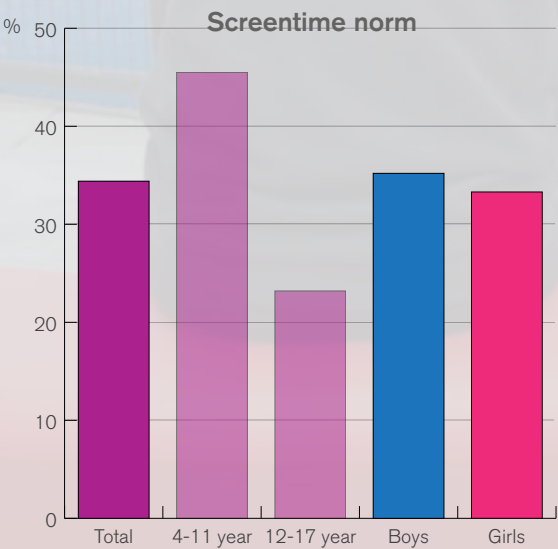
Sedentary Behavior

Grading

Benchmark: Of children and youth with a disability who watch television or sit in front of the computer less than two hours a day outside school hours.

Average Grade 2011 till 2015

	Age Group	Percentage	Grade
	4 -11 years	45.5%	C
	12-17 years	23.2%	D
Mean grade	4-17 years	34.4%	D



Key findings | Indicator Active Transportation

Disabled children in general

- 45.5% of 4-11 year old children sit in front of the computer or watch TV, less than 2 hours a day (average day of the week), outside school.²
- Only 23.2% of the 12-17 year old children sit in front of the computer or watch TV, less than 2 hours a day (average day of the week), outside school.²

Scholars in Special Schools

- No data is present.

Overall Findings

Sitting/lying behavior:

- 4-11 year old children sit/lie on average 7.9 hours per day on a school day.²
- 12-17 year old children sit/lie on average 11.1 hours per day on a school day.²
- 4-11 year old children sit/lie on average 6.5 hours during a day off from school.²
- 12-17 year old children sit/lie on average 9.2 hours during a day off from school.²
- Results of HBSC showed that only in the age group 11 years of age, only 73% of the children met the screen time norm and in the older age group (>12 years of age) only 5.4% met this norm.¹⁸

Recommendations |

- Reduce overall sedentary behavior and screen time in all children and youth with a disability. It has been shown in adults that higher levels of sedentary behavior cause higher risks for mortality.
- Inform and explain to parents and caregivers about the negative health consequences related to sedentary behavior. Also their role model behavior is of high importance. Help parents by providing good advice regarding screen time before and after school and TV's in bedrooms is discouraged. Make clear rules about the time after no social media and screen time tasks may be executed before sleeping.
- Break up sedentary time especially at school hours. Van Nooijen et al. (2014) reported that several studies show that short sitting bouts are favorable in terms of reducing cardiovascular risk.³⁴
- Stimulate youth who is hospitalized to stay out of bed as much as possible and to be physically active. The project 'Exercising next to Bed' [Bewegen aan Bed] of the Wilhelmina's Children's Hospital is a good example. See: http://www.hetwkz.nl/nl/Ziekenhuis/Afdelingen/Kinderbewegingscentrum/WKZ-Sportief#Aan_bed

Research Gaps

- A national norm for overall sedentary behavior is lacking. A future norm should include both screen time and sitting and lying behaviors. In a position statement of Hendriksen et al. (2013) it was suggested that a future guideline should include the total sitting duration per day which is acceptable and the frequency and duration of the non-sedentary moments which interrupt the sedentary bouts.³⁵ For children who are wheel chair dependent, this norm is possibly not suitable. Also other screen time apparatus should be included in this norm, with the current new technologies (smartphones, tablets etc.).
- Some countries have guidelines for different age groups regarding sedentary behavior. As mentioned in the Dutch Report Card for typically developing children, more research is needed to assess if a norm for different age groups is necessary and if so, these norms should be established.
- There is a need for a valid but clinically appropriate objective way to measure sedentary time, but physical activity behaviors as well. In the study of Bloemen et al (2017) in which physical activity is measured in wheelchair using youth with SB, the Vitamove and Actiheart were applied. Those instruments are not suitable for daily clinical practice, the total use (analyzing an interpretation) is time consuming.²¹

Literature synthesis

Health risks of being sedentary

- The risk of becoming overweight or obese is higher for children with a disability. Disabled children are more often sedentary and physically inactive due to their disability.¹⁵ Sedentary behaviors are "a distinct class of behaviors characterized by little physical movement and low energy expenditure."³⁶ Sedentary behavior contains activities such as watching television, playing video games or using a computer. High levels of sedentary behavior are associated with poor health outcomes.³⁷ Sedentary behavior is associated with a number of risk factors for chronic disease, including increased waist circumference, dyslipidemia and insulin resistance. It is important to stimulate children with a disability to be physically active and to minimize their sedentary behavior.³⁶
- In children with a disability it could be that they have higher sedentary time compared to typical developing children because of their disability. For individuals with CP for instance, it is shown that the physical strain during walking is higher in individuals with CP compared to healthy controls. In addition, an inverse relationship was reported for the physical strain of walking and the total time of daily walking. The individuals with CP could thus be less active in daily life to conserve energy or prevent fatigue.³⁴ This makes the total understanding and relations of behaviors of physical activity very difficult and therefore more research is needed to explore these behaviors in different groups of diagnoses.

Minimizing sedentary behavior

- Because of the risks factors of sedentary behavior, it is important to minimize sedentary behavior and stimulate physical activity among children with a disability. An effective method to minimize sedentary time, for example for children with cerebral palsy, is to break up sedentary behavior with short bouts of light activity.³⁶ In the study of Walker et al. (2015) they suggest to limit the screen time to no more than 2 hours per day and limit sedentary transport for children with a chronic disease. Besides, they suggest that clinicians should promote a reduction in overall sedentary time and promote an increase in breaks from sedentary time.³⁸

Contributing factors and disparities

- **Gender:** No remarkable differences were found for meeting the screen time norm between genders (4-11 years age group boys 48.4% versus 42.1% for girls, 12-17 year age group boys 22% versus for girls 24.5%). Girls have more hours of sitting and lying behavior in both week and weekend days (average day in the week 4-11 years age group boys 7.2 hours versus 7.9 hours girls, 12-17 year age group boys 10.1 hours versus 11 hours girls).²
- **Age:** As described in the key findings, many more older children (12-17 years of age) do not meet the screen time norm compared to the younger children (4-11 years of age) (23.2% versus 45.4% respectively). In addition, when assessing the sitting and lying behavior, the older children have higher sedentary times in both week and weekend days compared to the younger age group.²
- **Day of the week:** Children of both age groups sit substantially more in front of the screens during the weekend compared to week days (4-11 years week 49.9% vs. 22.4% weekend; 12-17 years week 26.3% versus. 17.9% weekend).²
- **Degree of urbanization:** Children of both age groups from the more rural areas meet more often the norm for screen time compared to children of (highly) urban areas (4-11 years 43.7% urban versus. 46.9% rural, 12-17 years 12.0% urban versus 33% rural).²
- **Type of education/transport to school:** For children in special schools, it is in many cases not possible to use an active mode of transportation, due to the large distances. Consequently, in transport time, these children are 'forced' to being sedentary twice a day for 5 days a week. Moreover, most of the school time is spent sedentary. The study of Bloemen et al. (2017) showed that wheelchair-using youth with SB spent 90% of their wear time sitting or lying. But, luckily, school is also the place where they spent significantly ($p < 0.01$) more time being physically active compared to weekend days.²¹

Literature synthesis

Health risks of being sedentary

Sedentary behavior is one of the most important factors in worldwide prevalence of obesity and overweight. Childhood obesity increases the risk of adult obesity and can have multiple chronic health problems such as, type II diabetes, hypertension and cardiovascular disease.^{54,55} There is need for more knowledge about what can occur when you are sedentary in childhood and what the health effects are of TV viewing and playing computer games. For this reason it is important to have more insights about the health consequences of sedentary behavior.

Parents

Parents are the primary caregivers, who are largely responsible for their children's nutrition and physical activity patterns, particularly in the early years of life. For this reason it is important to teach parents about the importance of a healthy lifestyle. Authoritative parenting is important to promote, because there is evidence that this is an effective method to prevent and manage childhood obesity.^{53,56}

Physical activity in the classroom

The key findings show that children are most sedentary during school time. The largest benefit can be obtained during school time. Mullender-Wijnsma et al.⁵⁷ studied the effect of physical activity in the classroom on academic performance. They developed physically active academic classroom lessons. During each lesson 10 to 15 minutes were spent on solving math problems followed by 10 to 15 minutes on solving language problems. This study showed

Contributing factors and disparities

- Screen time, computer time and TV time is higher in children with poorly educated parents than in children with highly educated parents.⁵¹
- Children in the age category 4 to 17 years spent a lot of time in front of the TV and computer. This screen time is lower in the age category 4 to 11 years than in the age category 12 to 17 years.⁴⁹
- Children sit/lie more on a school day than on an average day off from school.⁴⁸
- In general, boys sit/lie more in front of a screen than girls in the age of 10-12 years.⁴⁸

C

Sleep

Grading

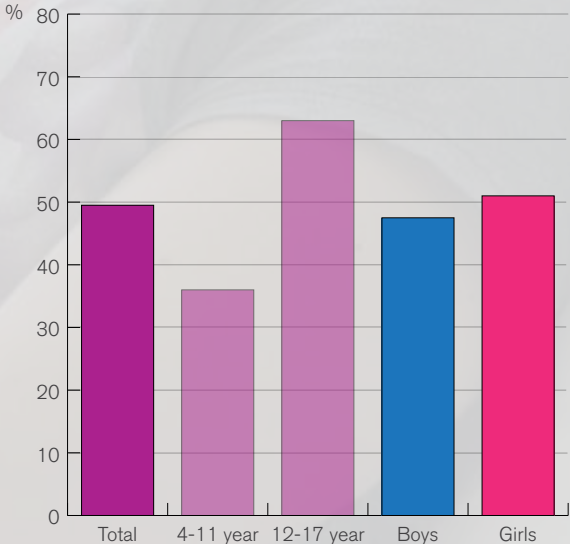
Benchmark: % Of children and youth with a disability who meet the sleep duration recommendations.

The benchmark for this indicator is based on the sleep duration recommendations described in the study of Hirshkowitz et al. (2015). These recommendations are for healthy individuals with normal sleep. The appropriate sleep duration for school-aged children is between 9-11 hours each night and for adolescents this is said to be 8-10 hours each night.³⁹

Average Grade 2011 till 2015

	Age Group	Percentage	Grade
	4 -11 years	36%	D
	12-17 years	63%	B
Mean grade	4-17 years	49.5%	C

Sleep norm



Key findings | Indicator Sleep

Disabled children in general

- 36% of the 4-11 year old children with a disability met the sleep recommendations.²
- 63% of the 12-17 year old youth met the sleep recommendations.²
-

Scholars in Special Schools

- No data present.

Overall Findings

- 9.9 hours is the average sleep per day in younger children with a disability (4-11 years of age).²
- 8.3 hours is the average sleep per day in the older age group with a disability (11-17 years of age).²

Recommendations |

- More attention is necessary for the importance of good sleep behavior and negative health consequences for insufficient sleep, for youth, parents as well as for caregivers.
- Encourage families to develop household bedtime rules. This is especially important to decrease sleep onset problems.

Research Gaps

- More research is needed in order to apprehend what amount of sleep is necessary for school-aged children with a disability. These studies should not only focus on the quantity of sleep but also on the quality of sleep, as the amount of hours in bed is not necessarily the hours of sleep.
- After more research is present, it is possible to establish clear sleep recommendations for children with a disability in different age groups and consequently, it will be easier to determine how many children meet these recommendations.

Literature synthesis

Sleep is a new, important indicator in the Report Card⁺. In the last few years, sleep research has had a more important role in the physical and mental health domain. This is probably due to the average decrease of sleep in children and youth nowadays, compared to decades ago. This decrease is the result of the modern way of life: late-night television, no bed rules and caffeine consumption.⁴⁰ Another factor is physical and sedentary behavior that affects sleeping behavior. Insufficient sleep can cause an increase in sedentary behavior and a decrease in physical activity, because of a lower energy level. Low energy levels can cause a lower QoL. On the other hand, a regular higher active life gives a good night sleep and after a good night sleep the energy level is higher.⁴¹ So, sleep has an important role in the physical and mental wellbeing of people.

For this Report Card⁺, the recommendations described by Hirschkowitz et al. (2015) were applied. Here, the appropriate sleep duration for school-aged children is between 9-11 hours each night and adolescents should sleep between 8-10 hours each night.³⁹ These sleep recommendations are for healthy individuals with normal sleep. There are no sleep recommendations available for children with a chronic disease or disability. In the

consensus statement of the American Academy of Sleep Medicine, it was advised that children 6-12 years of age should sleep 9-12 hours and adolescents 13-18 years should sleep 8-10 hours per 24 hours.⁴² Thus, unfortunately the amount of recommended sleep still differs between studies/ research groups.

The main part of research about sleep behavior of children with a disability is based on sleep disturbances and not on the quantity of sleep. The definitions of sleep disturbances in accordance to the Diagnostic and Statistical Manual of Mental Disorders 4th edition (2000) can be classified as dyssomnias, abnormalities in amount, quality or timing of sleep, and parasomnias, abnormal behavior or physiological events occurring in association with sleep, specific sleep stages, or sleep-wake transitions.⁴³

Previous studies have shown that sleep problems are more common in children with certain medical conditions, such as ADHD, chronic pain and autism.^{44,45} Owens et al (2000) investigated sleep behavior of children with ADHD. In children with ADHD, more problems with sleeping were reported, particularly at bedtime, compared to healthy children. Also the average sleep duration reported by parents was significantly shorter in the ADHD group. This is probably due to the problems with sleep onset.⁴⁵ Moreau

et al (2014) found similar results in a study with the same research aim.⁴⁶

Also, literature data indicates that bad sleeping behavior in patients with chronic disorders may exacerbate symptoms and affect the mental state as well as the.^{45,47} As mentioned before, there are no sleep recommendations available for individuals with a disability. Because of that, the sleep recommendations for healthy children are applied in this report card. From the comparison between sleeping behavior of children with a disability and typically developing children it is reasonable to assume that children with a disability need more hours sleep per day.

Contributing factors and disparities

- **Gender:** No great differences were found between genders in the younger age group in meeting the sleep recommendations: 35% of the 4-11 year old boys met the recommendation, compared to 37% of the girls of the same age. In the adolescent age group, higher percentages of girls (12-17 years) met the sleep recommendations compared to boys (65% versus. 60%).²
- **Age:** as seen in the key findings, about a third of the children in the younger age group (4-11 years) met the sleep recommendations, compared to two-thirds of the older children (12-17 years). The percentage of the younger children is low. As described in the literature synthesis, it is not clear what the best amount of sleep is, especially for the younger children as seen in the different recommendations. If other criteria were used to assess the grades, it might be that a higher number of younger children slept according to the recommendations. But, is it likely that sufficient sleep is more of a problem than in the younger age group.
- **Degree of urbanization:** Between children who live in more rural areas and children from urban areas no great differences were present in the sleeping behavior (4-11 years: 34% versus 38%, 12-17 years: 62% vs. 64% respectively).²
- The last few years, sleep behavior is a new upcoming factor in the research for the general health of people. This is particularly noticeable in the increase in studies, but it is not yet well integrated in daily life. Health today is mostly about enough movement and healthy food. The awareness of the effects of (in) sufficient sleep should be increased.
- Studies showed (described in literature synthesis) that children with a disability have more problems with sleep than healthy children.

INC

Weight Status

Grading

Benchmark: % Of children and youth with a disability who meet the sleep duration recommendations. The benchmark for this indicator is based on the sleep duration recommendations described in the study of Hirshkowitz et al. (2015). These recommendations are for healthy individuals with normal sleep. The appropriate sleep duration for school-aged children is between 9-11 hours each night and for adolescents this is said to be 8-10 hours each night.³⁹

Average Grade 2011 till 2015

	Age Group	Percentage	Grade
	4 -11 years	-	INC
	12-17 years	-	INC
Mean grade	4-17 years	-	INC

Key findings | Weight Status

Disabled children in general

- The mean BMI of the 4-11 year old children with a chronic disease is 16.5 kg/m².²
- The mean BMI of the 12-17 year old children with a chronic disease is 20.8 kg/m².²

Scholars in Special Schools

- When evaluating the scholars who attend special schools (all the clusters together), 68% of the children had a normal weight, 11% was underweight, 17% was overweight and 4% obese. When comparing the different clusters, the highest percentage of overweight and obese children (combined) was found in cluster III schools (25%).³

Overall Findings

- According to the HBSC Survey, which was filled out by secondary school children (~12 to 16 years of age), 66% of the children who stated that they have a chronic disease or disability had a normal weight. 16% of these children was overweight and 18% underweight.¹⁸
- Fitkids is a program where children with a chronic condition or disability can train with a physical therapist for six to twelve months. Many kids are sent to Fitkids because they are overweight. If the children whose primary condition is being overweight are filtered out of the data, still 30% of the children is overweight and 31% obese. It should be taken into account that most children are sent to Fitkids because they need to be more physically active, this could (partly) explain the high percentages of overweight children in this group.^{49,50}

Recommendations |

- Disabled children and their parents should be made more aware of negative consequences of bad weight, also in children with a disability. Furthermore, the relation of physical activity and weight should be more highlighted.
- Healthcare professionals should discuss weight status more during their health contacts, even though this might be a sensitive subject. It is important that the approach of conversations about weight is positively framed, strength-based and individually tailored.⁵¹
- Familiarity of programs and interventions special developed to improve physical fitness or weight (for example Fitkids and 'WKZ Sportive' [WKZ sportief]) should be increased among health care professionals. Children (and parents) will be more easily informed and could be forwarded to suitable programs. See <https://www.fitkids.nl> & <http://www.hetwkz.nl/nl/Ziekenhuis/Afdelingen/Kinderbewegingscentrum/WKZ-Sportief>

Research Gaps

- More data should be collected on the weight status of children with a disability or chronic disease. No grade could be given for this indicator as the current sample groups were too small.
- Some chronic diseases or medications can cause children to gain weight. It could be useful to find out what percentage of children is (partly) overweight because of this.

Literature synthesis

Obesity is a global concern. Obesity can lead to health consequences, such as pediatric cardiovascular diseases, diabetes, sleep apnea, as well as psychological disorders. Many risk factors for becoming overweight are mentioned, such as diet, family, cultural and environmental factors.⁵² Childhood obesity is the key predictor of adult obesity, which contributes to heart disease, stroke, numerous cancers and premature death. It has been reported that children with disabilities are at higher risk of becoming overweight and obese than their typically developing peers.¹⁵ For example, children with CP do not meet the guideline for physical activity, because of their gross motor function disability. Furthermore, there are medical reasons for the higher risk of overweight and obesity. Disabled children often take medication for their disability or disease.

Side effects of the medication can increase appetite, decrease satiety, or alter metabolism.^{52,53} Also parents and family play a major role in the risk of overweight and obesity. In the study of Bandini et al. (2015) it was reported that parents and family of children with a disability may lack knowledge about nutrition, physical activity and weight. Overfeeding may occur because of this lack of knowledge.⁵³

Obesity interventions for children with disabilities

Managing obesity, for example for children with cognitive disabilities, can be difficult. This is because of the inherent differences in nutritional challenges, social factors and cognitive skills.¹⁷ Therefore, it is important to start intervention programs. In the study of Grondhuis et al. (2014) an individual screening was recommended, for children with developmental disabilities, to assess if they can participate in weight losing programs. The goal of these programs is to change eating habits and limit sedentary behaviors. It is important to involve parents in this process.¹⁴ For children with SB, a coaching-based intervention seems to be effective. A coach can address the child's priorities and support them to make personally meaningful goals to lose weight.⁵¹

Contributing Factors and Disparities

- **Gender:** The mean BMI of girls was higher than boys especially in the 12-17 year old age group. In the 4-11 year olds the BMI for girls was 16.7 and for boys 16.3. In the 12-17 age group the BMI for girls was 21.4 and for boys 20.3.²
- **Degree of urbanization:** The mean BMI of children from (highly) urban areas was higher than of children from more rural areas. The BMI was 16.7 and 21.5 kg/m² of children from urban areas and 16.3 and 20.1 kg/m² of children from rural areas for 4-11 and 12-17 year age groups respectively.²
- **Ethnicity:** Data collected in schools in the Municipality Utrecht showed that 13% of the 13-14 year old children with a chronic disease is overweight. This percentage was much higher (33%) for children of Moroccan descent.⁵⁴
- **Type of education:** the data of the Municipality Utrecht, also showed that children who attend vocational education are more often overweight (22%) than children who attend higher education (7%).⁵⁴
- **Type of disability:** Children with CP (GMF classification system level I-III), who have a lower functional level and greater neuromuscular involvement are more often overweight or obese. However children who have even greater involvement functioning, level IV and V, are more often underweight. This is probably due to the fact that they have problems with eating and often require physical assistance.⁵²

Setting & Sources of Influence



INC

Family & Peers

Grading

Benchmark:

- % Of parents who facilitate physical activity and sport opportunities for their children (e.g., volunteering, coaching, driving, paying for membership fees and equipment).
- % Of parents who meet the physical activity guidelines for adults.
- % Of parents who are physically active with their kids.
- % Of children and youth with a disability with friends and peers who encourage and support them to be physically active.
- % Of children and youth who encourage and support their friends and peers to be physically active.

Average Grade 2011 till 2015

	Age Group	Percentage	Grade
	4 -11 years	-	INC
	12-17 years	-	INC
Mean grade	4-17 years	-	INC

Note: No data of the RIVM monitor regarding 'Family & Peers' were present. Thus no general information is present. Furthermore, the available data concerns only parents of children in in cluster III or IV schools. No information about the parental behavior in the other two clusters is present, consequently an Incomplete was graded.

Key findings | Indicator Family and Peers

Family

- 59% of the parents of cluster IV students considered it important that their child engages in sports or exercise frequently.⁴
- 75% of the parents stated that they are able to let their child engage in sports or exercise activities.⁴
- 72% of the parents encouraged their child to play sports or exercise frequently.⁴
- 59% of the parents enjoyed playing sports or exercising together with their child.⁴
- In a study about the role of the parents regarding the sports behavior of children with intellectual disorders (cluster III), it was shown that parents of whom the child joins a sports club, stimulate their children significantly more ($p < 0.05$) to sport and exercise, than parents whose child is not a member of a sports club. In addition, the results showed that parents whose children are a sports club member, consider the knowledge of the health effects of sports significantly more important than parents whose children do not engage in organized sports. Furthermore, the parents of the children who engage in sports had significantly ($p < 0.05$) better role model behaviors regarding a healthy lifestyle than parents who did not engage in sports.⁵⁵

Peers

- No data present.

Overall findings

- In the report of (Un) restrictive sportive [(On)beperkt Sportief] parents of children at special schools filled in a questionnaire about obstacles they have to face to let their children engage in sports. One of the most mentioned obstacles parents of children attending special schools have to face to let their children engage in sports is the unfamiliarity of the sports (ranging from 39% for cluster I parents to 16% for cluster IV parents). Financial reasons (too expensive) was ranked second (ranging from 23% for cluster III and for 8% cluster I). Other obstacles reported were; no time and/or energy to help, time of the day is inconvenient, no transport and the sports societies cannot cope with my child.³
- In a study of the RIVM, however, it was found that parents of disabled children did not significantly report finances more frequent as a barrier compared to parents of children without a disability.⁵⁶
- 92% of the parents of 4 to 7 year old children with SB met the Dutch guidelines for healthy physical activity and 84% of the parents of 8-18 year old youth met these guidelines.⁵⁷
- The results of the HBSC study, showed that 50.5% of the parents met the Dutch physical activity recommendations.¹⁸
- These results showed that 60.7% of the parents engaged in sports approximately at least once a week.¹⁸
- 90.9% of the parents of the HBSC study reported that they frequently or always, stimulate their child to exercise sufficiently.¹⁸
- 74.1% of these parents reported that they restrict their child in gaming, Smartphone use, Internet, etc.¹⁸
- 75.3% of these parents reported that they make sure their child does not watch TV too long.¹⁸

Recommendations |

- Inform parents about their large influence and importance of their health behavior (regarding exercise, sedentary behavior, food and sleep) attitude/ involvement and perseverance. Parents are important role models for their children. Make parents aware about the importance of physical activity, low levels of sedentary behavior, a healthy diet and sufficient sleep. Besides, parents have a large influence on the physical activity behavior of their children. Stimulate parents and increase the possibilities for parents to exercise and play sports together with their child.
- Next to parents, the total social environment (other family members, friends, caregivers, other involved persons) of the child with a disability have a large influence in realizing, facilitating and stimulating physical activity and healthy behavior. Make the social environment aware of this and support them where necessary.
- Develop effective interventions, which are family focused.
- Discuss possible fears parents can have, whereby they restrict their children to engage in sports and play activities. Show them that overprotection can also restrict their child in his/her exercise possibilities.

Research Gaps

- The aspect of parents and peers is not nationally monitored yet and in addition, no monitors or surveys were executed in all cluster schools. Future research should include the attitude and behaviors of the parents regarding physical activity, sedentary behavior, sleep and a healthy weight/ diet.
- More research about barriers and facilitators is needed.

Contributing factors and disparities

Parents

The influence of parents on the physical activity behavior in both typically developing children and children with a disability is large. Studies showed that the feeling of being restricted at the family level is most predictive for participation restrictions. Parents of children with a disability are considered to be of crucial importance because they have to provide opportunities to participate in a variety of activities. If a family has a less active orientation, this could be a result of the restrictions the parents felt when the child was young.³⁰

Unfortunately, there are still parents who believe that engaging in sports and exercise could be dangerous and not suitable for their child with a disability. They are often overprotective. For instance, parents of visual disabled children, worry that their child gets hurt during sports activities.⁵⁸

The results of the overview of Piskur et al. (2014) about the number of domains and priority needs as expressed by parents (n=146) in supporting participation of their 4 to 12 year old physically disabled children reported the following needs:

Laws, regulations and fees (36%), needs leisure time (35.6%), aids, adaptations, facilities and resources (33.8%). Needs belonging to the 3 categories, were all related to environmental aspects at home, school and in the community. For example, 54.1% of the parents scored the item of 'finding suitable recreational activities for my child's leisure'. All top 20 items for needs, except for one, concerned environmental aspects, such as finances, adaptations of environment, resources and social networks. Child factors or parents' own skills were not rarely reported.⁵⁹

In a focus group study involving youth (6-18 years) with CP and parents facilitators and barriers to physical activity were investigated. The following environmental barriers were found; the non-acceptance of the parents of the extent of the disability, dissatisfaction of the parents with the environment, fear that their child will not fit in (not being accepted by other children, too challenging motor tasks, poor fit between child and activity), parental challenges with observing the child struggling with sport (losing), challenges with managing the day-to-day aspects of raising a child with a disability, opinions that physical activity and

sport are unimportant, hesitation to ask a trainer (volunteer) to support their child. Other barriers were the lack of time and financial restrictions.²²

Facilitators for the parents on the other hand were, parental awareness of the benefits of physical activity, parental perseverance (in exploring sport options/adaptations), parental awareness (in advocating to their child) and having a positive attitude.²²

Peers

The influence of peers in the physically activity and sports behavior is also present and it might be that this influence is even more important in children with a disability compared to typically developing children. Peer relations in physical activities and sport settings were assessed in disabled children and it showed that children who are perceived to be different (for instance have a physical impairment) or seem to lack motor competence (in developmental or coordination disorders) may be at increased risk for peer rejection or neglect. It is known that in physical activity settings, the children who are the most popular (having the strongest peer relations) are the ones possessing the most perceived physical ability.⁵⁸

In the focus study group of Verschuren et al. (2012), the peer influence was assessed as well and non-acceptance by peers and being bullied were reported as barriers as well.²²

Contributing factors and disparities

- **Social Economical Status (SES) of the parents:** the study of Piskur et al. (2014) showed that parents with lower SES have more needs in the domains 'Laws, regulations and fees'. In this study it was reported as well, that the family income is a determinant of parent's needs related to finding community and financial resources. Furthermore, it was found that a lower intensity of participation of children with a physical disability was related to lower family SES.⁵⁹

INC

School

Kitty Kamping

Grading

Benchmarks:

- % Of schools with an active school policy (e.g. offering sports- and exercise activities next to physical education (PE) or activities during recess, collaboration with communities and/or sport clubs, presence of annual planning)
- % Of schools with a PE specialist
- % Of schools where the students have at least 90 minutes of PE per week
- % Of students who have at least 45 minutes of outside play time during school for 5 days per week.

Average Grade till 2015

		Percentage	Grade
Grading		-	INC

Note: Data is present about regular education and special education. However, as a consequence of the regulation 'Appropriate Education' [Wet Passend Onderwijs] (see heading 'Present Situation' below), some children with a disability attend regular schools and participate in regular PE. The specific situation for these children is unknown and consequently an Incomplete was graded.

Key findings | Indicator School

Active school policies (play time during recess)

- 71% of the special schools* offered their students other sports and exercise activities.⁶⁰
- 62% of the students in primary special schools can participate in sports- and exercise activities after school.⁶⁰

Presence PE specialists

- Both in cluster I and II schools 100% of the schools have a PE specialist.³
- Averaged over 2011 and 2013, the results of the monitors showed that in 84.2% of the cluster III schools a PE specialist is present.^{3,5}
- In 94% of the cluster IV schools a PE specialist is present.^{3,4}

Duration and frequency of PE lessons

- Scholars in all the four cluster schools receive PE twice a week.³⁻⁵
- Scholars of special primary schools (SPS) and secondary special schools (SSS) have at least twice a week PE (SPS 2.16 times/week and, SSS 2.44 times/week).⁶⁰
- For cluster I schools, no numbers are present about durations of PE lessons.
- For cluster II schools, scholars have an average of 66 minutes PE per week, in secondary cluster II schools this is 88 minutes per week.³
- In cluster III schools scholars receive between 63 and 78 minutes PE per week.⁵
- In cluster IV schools scholars have an average of 94 minutes PE per week, scholars of cluster IV secondary special schools have 103 minutes PE per week.⁴

Active playtime during school time

- 50% of the 4-11 year old students plays at least 45 minutes outside during school time for 5 days per week.²
- The average minutes of active play time at school is 284 minutes per week for the 4-11 year old children with a disability.²

Other findings

- In cluster IV schools 46% of the scholars reported that they can exercise and play sports properly at the school yard.⁴
- According to the scholars, 40% of the cluster IV schools encourages the students to exercise and play sports.⁴
- 37% of these scholars reported that possibilities are present to participate in fun sports and activities during recess.⁴
- Only 11% of these scholars reported that they can participate in fun sports and exercises activities after school.⁴

* Cluster I: Schools for visual impaired children or children with multiple disabilities who are visually impaired or blind. Cluster II: Schools for deaf children and hearing impaired children, children with speech or language difficulties and children with communicative problems, as with some forms of autism. Cluster III: Schools for children with motor and/or mental disabilities, chronically ill children and children with epilepsy. Cluster IV: Schools for children with psychiatric disorders or severe behavioral problems and schools that are related to pedagogical institutes. For more information see Explanatory Note, page 12.

Present situation – Appropriate Education Regulation [Wet Passend Onderwijs]

In 2014, the regulation 'Appropriate Education' [Wet Passend Onderwijs] was introduced, which aims that every student should attend a school that provides education suited to their talents and capabilities. Schools should adapt their teaching to the individual child's development and offer extra assistance. This applies to the school where the child is currently registered, another mainstream school or a school providing special education or special secondary education.⁶²

As a consequence of this regulation, a number of students with a disability attend regular schools and consequently have 'regular' PE and a number of students have PE in special schools.

Unfortunately, no numbers are present about how many of the students with a disability have to participate in regular PE and what the actual participation of these students is. Can they really participate, during the entire PE lesson or do they have to step out in some special exercises?

In addition, the regular schools were already assessed in the Report Card for typically developing children. Therefore, only results regarding special schools will be discussed here.

Recommendations |

- Stimulate the communication and collaboration between PE teachers and specialist to result in a higher quality of PE. As a result of the new regulation of Appropriate Education, it is highly plausible that PE specialists and teachers have more heterogeneous groups of students. Since the PE teachers see the students more often, it is assumed that they have more knowledge about the special students, compared to the PE specialists. It is advised, that especially for special individuals and cases, the collaboration between the PE specialists and teachers should be intensive. Appropriate PE of high quality might then be guaranteed, for the group for whom this type of physical activity is of high importance.
- Increase the course offer about children with a disability in the teacher's education. The new regulation Appropriate Education, requires more knowledge and competences from more PE teachers at regular schools. An increased basic knowledge will result in a higher quality of the education.⁶⁰
- Promote the role of combination functionaries and community sport coaches for special schools with regard to organizing more sport and exercise activities. It seems that only 32% of the special schools (primary special schools as well as special schools) collaborate with the combination functionaries and coaches. This is more than 10% less than in regular schools.⁶⁰
- Increase the sports and exercise activities offer during and after school, next to regular PE. For children who have little time left or have little/no possibilities outside school, it will be easier to engage in physical activity.
- Increase the duration of the PE lessons, so the effective lesson time will increase.
- Stimulate and intensify the collaborations between (sports) organizations, communities and (special) schools to help each other in problems with accommodations and the offer of sport and exercise activities during and after school time.⁶⁰
- Inform organizations who are responsible for after school care, about their influence on the exercise and sedentary behavior of children. Provide sport and exercise possibilities and try to keep the sedentary levels as low as possible.

Contributing factors

- Insufficient accommodations or sport fields were frequently reported as one of the problems for providing more PE lessons or sports activities at school. 2 out of 5 respondents of secondary special schools reported insufficient sport fields and only 2% of school directors reported to have insufficient PE gymnasias.⁶⁰
- Insufficient financial resources to extend the PE lessons, renting accommodations or to have higher qualified personal is reported in 54% of the secondary special schools as barriers to provide more PE lessons or sports activities.⁶⁰

Research gaps

- Little is known about the intensities during PE lessons in all cluster schools. It is plausible that low levels of moderate-to-vigorous intensities are achieved during the lessons.
- Next to small evidence about intensity during the PE lessons, no information is present about the quality during the PE lessons.
- No research exists yet, that investigates the participation levels of the students with a disability during PE in regular schools.
- No data is present about the physical activity and sedentary behaviors of children (with a disability) in after school care.

Literature synthesis

As reported in the Report Card for typically developing children, school is the setting in which many children can be reached and it is important that at school a healthy lifestyle should be promoted. This applies as well for special schools.

Specials schools consider sports and exercise especially important for the enjoyment students experience with it. In addition, physical exercise and learning to collaborate and playing together are considered important as well.[3]

Nearly, three-quarters of the leaders of secondary special schools would like to contribute to the health of the students and this is one of the main reasons for them to realize a large course offer regarding sports and exercise. In regular secondary schools, this was only 38%.⁶⁰

As the Healthy School approach is a good initiative to stimulate schools to adapt their policies regarding a healthy and active lifestyle and integrate this in their way of education, it is unfortunate that only 66% of the secondary special schools is acquainted with the Healthy School approach. This is quite a bit less than for regular schools. Further 6 out of 10 specials schools know the Sports Impulse and combination functionaries and community sports coaches.⁶⁰

In the study of Einarsson et al (2016), activity behaviors of typically developing children and children with intellectual disorders were investigated by using accelerometers and questionnaires. The results showed that the children with intellectual disorders accumulated 15.1 minutes less of moderate-to-vigorous activity during school hours and 22.3 fewer minutes after school, compared to typically developing children. The results showed as well that the children with an intellectual disorder depend more on their schools for their physical activity, compared to typically developing children (those children (59%) accumulated significantly more minutes of MVPA during school time than after school time, compared to typically developing children (47%).⁶³

INC

Community and the Built Environment

Grading

Benchmarks:

- % Of children and parents who perceive their community/municipality is doing a good job at promoting physical activity (e.g. variety, location, cost quality).
- % Of communities/municipalities that report they have policies promoting physical activity.
- % Of communities/municipalities that report they have infrastructure (e.g. sidewalks, trails, paths, bike lanes) specifically geared toward promoting physical activity.
- % Of children or parents who report having facilities, programs, parks and playgrounds available to them in their community.
- % Of children or parents who report living in a safe neighborhood where they can be physically active.
- % Of children who report having well-maintained facilities, parks and playgrounds in their community that are safe to use.
- % Of children and parents who report that in organizations like sports clubs, they (their child) are socially accepted and that social accessibility is present.

Average Grade 2011 till 2015

		Percentage	Grade
		-	INC

Note: in the Report Card for typically developing children, data of the Leisure time Omnibus [Vrijetijdsomnibus] of the CBS and SCP was used to grade this indicator. Unfortunately, the sample size of children with a disability was too low for both 2012 and 2014 to use the results and consequently an Incomplete was graded.

Key findings | Indicator Built Environment

Key findings/Overall findings

- Children with a disability play at the same play locations as typically developing children.⁵⁶
- 12% of parents of children with a chronic condition reported that play sets/play grounds are not nearby enough.⁵⁶
- Only 2% of these parents reported that the play sets/equipment are not safe and/or badly maintained and only 1% considered play sets/equipment not safe (for younger children).⁵⁶
- 9% of these parents reported that it is not safe for their children to play in the neighborhood, due to traffic safety.⁵⁶

Recommendations |

- Increase the facilities and possibilities for sports clubs to educate their staff and volunteers properly to learn how to train with disabled athletes.
- Stimulate sports clubs to hire volunteers for supervising sports activities and clinics for people/youth with a disability.
- Increase and facilitate the communication between parents, trainers/coaches, PE specialists and teachers, for which knowledge of the possibilities and capabilities of the child is present. This will facilitate the sports participation of a child with a disability at a sports club.
- Increase the offer of sports and exercise activities in the neighborhood, so that children who cannot fit in a sports team (for several reasons) can still engage in physical activities.²²
- Collaborations between foundations as the Playground Gang [Speeltoinbende] and communities should be encouraged and elaborated. Results of the Playground Gang could be very useful and relevant in the (re) building of an optimal (built) environment.

Contributing factors and disparities

- As seen in the Report Card for typically developing children, insufficient traffic safety is also reported as one of the barriers for play- and exercise behavior in the neighborhood regarding parents of children with a disability.
- In the Report Card, some parents reported that the playgrounds are not nearby enough, in addition, a small group of parents of disabled children reported this as well. It is plausible, that fewer adapted and highly accessible playgrounds are present and consequently, distances are larger for the disabled children.

Research Gaps

- More national research is necessary in large groups of children with a variety of diagnoses. For the national monitor about neighborhood satisfaction [Vrijetijdsomnibus], not enough children with a disability were included, so the data could not be used here.
- More research regarding the social acceptance and accessibility in sports clubs and other settings is needed. Spatial conditions could be present, but if the staff won't assist a child for example, participation is not stimulated.

Literature synthesis

Environment

Of several factors, the influence on the exercise behavior of children and adolescents is proven. These factors include: presence and number of exercise and play facilities in the neighborhood, presence of green areas and/or water in the neighborhood, traffic safety, informal play areas as sidewalks, parkings and variety in routes.⁵⁶

Research of RIVM, in which parents (n=89) of 5-14 years old children, with a chronic disease were asked about the play locations of their children, showed that there were no significant differences in play locations between children with and without a chronic disease. Top 4 play locations were; 1) own yard, 2) playground with play equipment, 3) square, where it is possible to play, cycle, skate etc., and 4) playfields (grass).⁵⁶

Possible spatial barriers to play outside in the neighborhood were assessed as well in both children with and without a chronic disease and again, no significant differences were present (see overall findings).⁵⁶

(Social) accessibility sport federations/clubs

Sport federations are doing well in integrating adaptive sports. They see it as a social responsibility to do so and agree that it is important. Sports for the disabled, is not just something 'extra' anymore and disabled people are a target

audience like any other group. However, sport federations still encounter some difficulties in the field of sports for the disabled. They want to reduce the amount of regions where there are no or too little opportunities for the disabled in their field of sport. However, sport clubs are often not very keen to start offering opportunities for people with a disability. This is mainly caused by a lack of knowledge.²⁷ Communication between federations and clubs is crucial to take away this problem, but federations miss manpower to accomplish this.

In the sports provider monitor [Sportaanbiedersmonitor] of the NOC*NSF, 428 sports providers were questioned about the policies and sports offer regarding individuals with a disability and /or chronic disease.

Results showed that 42.9% of the sports providers has members with a disability. Type of disability/disease varies between providers. Remarkably is that not even a quarter of those providers has an offer for youth (21.4%). Fortunately, 29,2% of the questioned sports providers would like to involve disabled individuals more in their sports club.

The most reported barrier why the providers do not have a special sports offer was the absence of (qualified) trainers or supervisors, to accompany the disabled athletes (44.2%), second was the low number of volunteers to accompany/ supervise these disabled groups (37.6%) and third the low amount of staff who would like to attend special training or courses to increase their knowledge and consequently can supervise disabled athletes (20.2%).⁶⁴

In the study of Verschuren et al (2012) adolescents with CP were questioned about barriers regarding sports clubs. Mentioned barriers were trainers who are not aware of the complexity of the condition/disease, teams that are too big, the sports club is not open to children with a disability, the presence of a waiting list, the special children are not allowed to engage in competitions, the children are underestimated and the absence of appropriate teams for the child (concerning level and age).²²

Next to problems in supervision, acceptance seems to be another factor which influences participation in sports clubs and other settings. In a study, parents of children with a disability (athletes and non-athletes) were asked what sport clubs could do to increase the sports participation and 25% of the parent mentioned supervision and 19% mentioned acceptance.⁶⁵

In a study of the Mulier Institute the accessibility of sports accommodations for individuals with a disability was assessed. 75% of individuals both with and without a disability reported that they were (very) satisfied with the accessibility of sports accommodations for individuals in a wheelchair.⁶⁶

45% of the individuals with a disability experiences restrictions by environmental factors, such as membership costs, arrangements for transportation, limited sports offer in the neighborhood. 3% of individuals with a disability who do not engage in sports consider accommodations as insufficiently accessible.⁶⁶



Strategies & Investments

INC

Government and non-Government Strategies and Investments

Grading

Benchmarks:

- Evidence of leadership and commitment in providing physical activity opportunities for all children and youth.
- Allocation of funds and resources for the implementation of physical activity promotion strategies and initiatives for all children and youth.
- Demonstrated progress through the key stages of public policy making (i.e. policy agenda, policy formation, policy implementation, policy evaluation and decisions about the future).

Average Grade 2011 till 2015

Grading		Percentage	Grade
		-	INC

Vision current government

The Dutch Government considers that physical activity and sport is very important for people with a disability. In 2013, the study (Un)limited Sportive [(On)beperkt sportief] was undertaken by order of the Ministry of Health, Welfare and Sport (VWS). This study focused on the physical activity and sport participation of people with a disability (including children and youth). It was concluded that the sport participation of disabled people (29%) is less than people without a disability (59%).³ As a response, a new policy, to increase sport participation among people with a disability was developed. This policy focuses on the following points:

1. Sports for people with a disability, has to be integrated in regular sport associations.
2. The Ministry of VWS subsidizes projects such as Special Heroes. The reason for this financial support is that these projects focus on an increase in sports participation of disabled people. Special Heroes in particular focuses on the sports participation of children and youth with a disability.
3. The government focuses on decentralization of sports for disabled people. The local authorities are responsible for local sports activities for people with a disability. For this reason collaboration between different local authorities is necessary to increase the supply of sports opportunities.

In summary, the government supports projects which focus on increasing sports participation of disabled people. Besides that, they stimulate the collaboration between local authorities and local initiatives, so people with a disability can participate in sports activities in their own neighborhood.⁶⁶

- Sport for disabled people policy letter

The Dutch Government asserts that everybody should have the possibility to take part in sports activities in their own neighborhood. This cannot be taken for granted for disabled people. Therefore, The Ministry of VWS brought a new policy forward, named Active without Limits [Grenzeloos Actief]. The aim of this policy is that physical activities and sports ought to be available for everybody with a disability. A budget of €6.6 million is available from 2015 up to 2018.⁶⁷

- Active without Limits [Grenzeloos Actief]

The ultimate aim of Grenzeloos Actief is that after 2018 people with a disability can find suitable and accessible physical activity and sports opportunities in their neighborhood. To achieve this, 4 points are followed:

1. and 4. Regional collaboration and reinforce the opportunities for physical activity. It is important that people with a disability know where to find information about the sports options in their neighborhood. Top athletes tend to increase publicity about where to find these clubs. Furthermore, people should be actively referred to sports clubs.
 2. Facts and figures
More knowledge about the target group is necessary; what policy is needed for what kind of disability and how can certain groups of people be reached. Furthermore, knowledge that is already available should be shared and be made accessible for anyone who is interested.
 3. More attention for the program Sports and Exercise close to Home [Sport en Bewegen in de Buurt]. This program mainly focused on healthy people and there should be more attention for people with a disability. The program will be evaluated in 2018.^{67,68}
- **Sports and Exercise close to Home [Sport en Bewegen in de Buurt]**
Sports and Exercise close to Home (SBB) is a national program initiated by the Ministry of VWS, working together with the Ministry of OCW (Education, culture and science), local governments and non-governmental actors (municipalities, sport clubs).
 - The program started in 2012. The annual budget for this project is €144.8 million, including a subsidy from the Government of €57.9 million. The aim of the program was to deploy more combination functionaries and especially community sports coaches. Their mission is creating suitable opportunities for physical and sports activities in their own neighborhood and making connections between providers of sports and physical activities on the one hand and organizations from other sectors, like healthcare, childcare and business, on the other hand. The original target groups were children (4-12 years) and youth (12-18 years). With Active without Limits, more focus will be on disabled sports in the SBB program.⁶⁹
 - **Combination functionaries and Community sports coaches for children and youth with a disability**
In 2015, the Dutch government indicated that the program Sports and Exercise close to home should focus more on people with a disability. This program started in 2015 and continues until 2018. The community sports coaches should be concerned with programs that focus on children with a disability such as Special Heroes (see below). The community sports coaches play a role in communication between schools and local sports clubs.⁷⁰
 - **Sports Impulse [Sport Impuls]**
Another part of the SBB initiative is the Sports Impulse. Sports Impulse grants are available for sports providers

to set up activity programs for sedentary or low-participation groups and eventually gain a structural sports offer. Sports Impulse started in 2012. The grants are also available for projects, which focus on people with a disability. There were 170 projects in 2012, 23 focused on disabled people.³ In 2015, €9 million was available for the total of these grants. Remarkable, is that in 2014 the budget was €16 million. In 2014, 14% of the projects focused on people with a disability and 16% on people with a chronic disease.⁶⁹

- **Foundation Unlimited Sportive [Stichting Onbeperkt Sportief]**

In 2001, the Foundation for Disabled Sports in the Netherlands [Stichting Gehandicaptensport Nederland] was established. This foundation played a crucial role in sport associations for disabled people. The State Secretary of VWS stated that sports for people with a disability had to be integrated in regular sport associations. For this reason, Foundation for Disabled Sports in the Netherlands changed into a national center of knowledge specialized in sports for disabled people. Because of this change they changed their name into Unlimited Sportive [Stichting Onbeperkt Sportief] in 2013.³ In 2014 the Ministry of VWS insisted that one office for information about sports, including sport for people with a disability, is desirable. Unlimited Sportive is included in this new knowledge center. The aim of this knowledge center is to increase knowledge, awareness and familiarity with regard to sports for people with a disability. Collaboration with partners in education, rehabilitation, government and sports is necessary to enhance physical activity and sports for disabled people. To achieve their goal, Unlimited Sportive has an annual budget of €4.3 million, including a subsidy of €2.7 million provided by the government.²⁹

- **Special Heroes**

In 2008, the ministry of VWS requested Unlimited Sportive and NOC*NSF to start a program to stimulate sports participation among people with a disability. A program, named Special Heroes was started in 2009 (until 2015). The aim of the project was to embed physical activity and sports in schools for special education and stimulate children with a disability (6-19 years old) to participate in sport activities.³ 185 special education schools participated in this project.²⁹ The program was mainly implemented in cluster III schools, and to a lesser extent in the other cluster schools.³ This program consisted of 3 different stages. Stage 1) external sport clubs offer physical activities during the regular PE lessons. Stage 2) external sports clubs offer physical activities after school.³³ Each special education school, which participates in the program, received a subsidy of €10.540 provided by the government, to realize stage 1 and 2. [] In stage 3, they focused on ensuring the continuity of the program and structural sports participation (outside of school) of the involved children.³³ Evaluation of the program showed a 12%-16% increase of structural physical activity and organized sports participation of children with a disability. So the program seems to be effective.²⁹

- **Provinces**

In the study of van Lindert et al. (2016) the policy of the 12 provinces in the Netherlands was investigated. 7 of the 12 provinces have a special policy according to sport for disabled people. 10 of the 12 provinces have a special budget to stimulate sports participation among these people. Some provinces do not have a policy on sports for disabled people, but they give a grant to organizations, which will be partly spent on disabled sports.⁶⁸ Province Groningen for example, has an annual budget of €20.000 for projects that focus on sports participation of disabled people.⁷¹

- **Municipalities**

The local authorities play a major part in the program Sport and Exercise close to Home, so the policy of local authorities is important.⁶⁹ 66% of the local authorities have special policy aims with respect to sports for disabled people. The most common activity on which these local authorities focus is the use of community sports coaches (59%), which they also rated as the most successful activity in the field of disabled sports. 65% of the local authorities that have policies in the field of disabled sports said that their community sports coaches also work on sports for disabled or chronically ill people. Other important activities are providing insight into the sports possibilities (47%) and improving and increasing suitable sports opportunities (47%). All these activities are aimed at getting more disabled people to participate in physical activities and sports.⁶⁸

- **Municipal Disabled Sports Match [Gemeentelijke Sportmatch Gehandicaptens]**

The Municipal Disabled Sports Match is a project from Unlimited Sportive. It is a model that can be used to find out what a municipality needs in the field of sports for disabled people and what they currently offer. By comparing this, it will be clear which interventions are needed and where they are needed. This will make it easier for municipalities to improve their sports offer for people with a disability.^{72,73}

Non-government

Part from governmental investments there are also several non-governmental initiatives. Most of them are foundations providing opportunities to be physical active and to participate in organized sport activities.

Foundations focusing on disabled children

- **Dutch Foundation for the Disabled Child [Nederlandse Stichting voor het Gehandicapte kind]**

In 1950, the Dutch non-profit foundation for disabled children was established. Their point of view is that children with and without a disability have to grow together. Their annual budget of €4.6 million is spend on the accessibility of playgrounds.

Furthermore, adapted accommodations and materials are realized in order that children with a disability can participate in physical and sport activities. Evaluation showed that their projects reach about 1.5 to 2 million people, with and without a disability, each year. Further, evaluation showed that they need to improve their reputation in order to recruit more donors.⁷⁴

- **The Cruyff Foundation**

The Cruyff Foundation is a non-profit organization, which was established in 1997. This organization stimulates disabled children and youth to be physical active and to participate in organized sport activities.⁷⁵ Their annual budget is around €1.5 million.⁷⁶ They financially support partner organizations for the purpose of stimulating sport, play and physical activities. The funding varies between €1.000 and €50.000. Additionally, the Cruyff foundation makes sport requirements and wheelchairs available. 60% of the organizations, which received a funding, reached their own targets.⁷⁵ The projects result in around 50.000 disabled children who participate in sport activities weekly. Furthermore, around 2.000 children with a disability make use of special Cruyff Courts.⁷⁷ In 2011 the projects were evaluated by the Mulier Institute. The evaluation showed that organizations with less financial support had to deal with different problems for achieving their targets. Therefore, it was recommended that these organizations should have additional support or financial support so that the targets are realized more quickly and more effectively.⁷⁵

- **Esther Vergeer Foundation**

Esther Vergeer is a successful wheelchair tennis player. She developed the Esther Vergeer Foundation in 2004. This foundation focuses on youth with a disability aged between 6 and 25 years. The aim of the initiative is to stimulate youth with a disability to participate in sport activities, because of the particularly important role of sport in self-confidence, self-esteem and independency. Each year, the foundation organizes around 100 clinics for about 2000 disabled children. The annual budget for projects is around €24.000.⁷⁸ An example of some projects is Join the Club. In these projects, the foundation takes care of both youth and sport clubs. In this way, youth is prepared for the integration in sport clubs.⁷⁹

- **Mentality Foundation**

The Mentality Foundation was founded by Bibian Mentel, a Paralympic snowboarder. The foundation focuses on getting children and adults with a physical disability to start doing extreme board sports, not only for the physical benefits, but also for the mental aspects. By doing something seemingly impossible like extreme board sports, people with a disability will realize they can do much more than they might think.⁸⁰

- **Playground gang [Speeltuimbende]**

The Playground gang is a test team consisting of children with and without a disability, for testing playgrounds on accessibility. They want playgrounds

in the Netherlands to be accessible for disabled and non-disabled children, so they can play together. The foundation originated from the project 'Playing Together' [Samen Spelen] of the - Dutch Foundation for the Disabled Child. There are already quite some playgrounds where children with and without a disability can play together. These playgrounds can be found on the website of the Playgroundgang.^{81,82}

- **Sports gang [Sportbende]**

The Sports gang is comparable to the Playgroundgang. It also derived from the 'Playing Together' project from the Dutch Foundation for the Disabled Child and NOC*NSF. Teams of children with and without a disability investigate if sport clubs are accessible for disabled people. They interview coaches and the management of sports clubs, examine the sports facilities and take a look at a training session. The recommendations they do can be used to ask the Dutch Foundation for the Disabled Child for financial support in making the sports club more accessible for people with a disability.⁸³

- **Foppe Foundation [Foppe Fonds]**

The Foppe Foundation makes an effort to help children for whom doing sports and playing is hard because of a physical or mental disability or because of financial reasons. With financial contributions, the Foppe Foundation helps children to do sports and play. They already helped 100 children to get an electric sports wheelchair and are now focusing on horse riding for disabled children.⁸⁴

Examples of regional initiatives

- **KIDS Zwolle**

The goal of KIDS Zwolle is to develop sports activities for children that face difficulties in regular sports clubs because of a developmental problem, physical disability or chronic disease. They have programs for primary school kids as well as for secondary school kids. For some of the programs from KIDS Zwolle the children pay a monthly fee for their membership. Besides the income from membership fees, the foundation is dependent on subsidies and donations.^{85,86}

- **KidsUnited Groningen**

KidsUnited is a soccer club for kids with a physical or mental disability. The goal of this foundation is to let children play sports and have fun. Teams consist of children with different conditions, which help them to learn to accept each other's disabilities. They also play games against normal soccer teams. The young players in these teams will learn to accept disabled people for the rest of their lives. More recently, KidsUnited started offering others sports and they would like to further extend this. The foundation is financially dependent on subsidies, sponsoring and donations.⁸⁷

- **Happy2Move Amsterdam**

Happy2Move offers afterschool activities for children

(4-20 years old) with a mental and/or physical disability. After school and during holidays they offer activities focused on sports, healthy eating and fun. The people at Happy2Move agree that children with a disability deserve the same rights as children without a disability. Participants pay Happy2Move with their Personal Budget, which is a sum of money disabled people get to spend on care they desire.^{88,89}

- **Only Friends (Amsterdam)**

Only Friends is a sports club for children with a physical or mental disability or chronic disease. They offer different kinds of sports at their own sport center: The Friendship Sports Centre. Members pay a fee, like they would at a normal sports club. Only Friends has around 600 members. Recently a similar initiative was started in Utrecht.⁹⁰

Foundations for disabled people in general

- **NOC*NSF**

"Nederlands Olympisch Comité * Nederlandse Sport Federatie" (NOC*NSF) is the main association for organized sports in the Netherlands. It was established in 1993. The annual budget is €40 million, including a subsidy of €28 million provided by the government. They are the umbrella organization for sports federations.⁹¹

About sports opportunities for people with a disability they say: "together wherever possible and only separate if that is the only option".⁹² They want people with a disability to be able to play sports close to home within the organized sports format. NOC*NSF wants to expand and improve the opportunities to play sports for disabled people.⁹² For example, 'Challenging Sports Offer' [Uitdagend Sportaanbod] for disabled people is one of their projects. This project, which started in 2008 and ended in 2012, focused on increasing sports participation and integration of youth with a disability. NOC*NSF financially supported 843 sports clubs. In collaboration with sports federations they accomplished an increase in sport possibilities for disabled youth. In 2013, when the project was evaluated, they found that 425 sport clubs improved their offer for disabled youth and 162 sport clubs developed new opportunities for youth with a disability.³

Next to recreational sports, NOC*NSF also tries to connect Olympic and Paralympic elite sports as much as possible.⁹²

- **Sports for the Disabled the Netherlands [Gehandicaptensport Nederland]**

Sports for the Disabled the Netherlands is aimed on physical activity and sports designed for people with a disability. This foundation was established in 2001. Their vision is that physical activity and sports have to be available for everyone. For that reason, sports and activities regarding active play, for disabled people, are offered close to home. They are an umbrella organization for sports clubs for adaptive sports clubs and a sports federation for special sports. Their annual budget for projects is around

€500.000.⁹³

- **Foundation for Disabled Sports [Fonds Gehandicaptensport]**

The Foundation for Disabled Sports wants to make sports available for everyone, qualitatively and quantitatively improve the sports opportunities and generate more attention for disabled sports. They focus on recreational as well as elite sports for people with any type of disability. They subsidize sports events and sports organizations, raise (financial) resources and provide education.⁹⁴ They spend around 3 million euros yearly on projects.⁹⁵

- **Sport Uniquely [Uniek Sporten]**

One of the projects of the Foundation for Disabled Sports is Sport Uniquely. This is a website and an app that should help get more people with a disability to enjoy sports. These digital media should help people with a disability find the right sport.⁹⁶

- **Dirk Kuyt Foundation**

Dirk Kuyt is a professional soccer player. In 2005, he developed the Dirk Kuyt Foundation. The aim of the foundation is to support disabled people (including children and youth with a disability) in their sport activities. Their motto is Sport & Fun is for Everyone. The initiative financially supports sports projects for people with a disability. Furthermore, the foundation makes sports requirements and materials available. Their annual budget is around €270.000.^{97,98}

The Dirk Kuyt Foundation Sports Day [Sportdag] is an example of one of their projects. Sports clinics are provided for 120 people with a physical or mental disability. (Former) professional athletes supervise sports activities such as wheelchair hockey, sitting volleyball and G-soccer. For the future they want to focus on collaboration with sports associations, so that sports for disabled people is more easily accessible.⁹⁸

Other foundations

- **Youth Sports Fund [Jeugsportfonds]**

The Youth Sports Fund was established in 1999 and is financed by both public as private funds. 24% of its income originates from the private sector. The aim of this initiative is to let children from a low socioeconomic status participate in a sports club and to provide the necessary sports equipment. In the 2014- 2017 business plan, one of their goals is to let more children with a disability participate in a sports club that offers adaptive sports.⁹⁹ In 2016, the Youth Sports Fund reached 49.466 children (with and without a disability).¹⁰⁰

- **Play Sports without Limits App [Sportdrempeelvrij App]**

The mobile App Play Sports without Limits is developed by the Mulier Institute, Foqus Consultancy and I-Pulse Internet Solutions. They are financially supported by the Rehabilitation Foundation [Revalidatiefonds] and

the Ministry of VWS. In the app people with a disability can rate sports accommodations on accessibility and usability. The application is developed to give more insight in the problems people with a disability face when visiting a sports accommodation.¹⁰¹

Recommendations |

- Currently, it is not possible to give a valid judgment regarding the effects of all the initiated programs and policies. More research has to be initiated to monitor the effects of the programs and policies. To do so there are some improvements to be made for the data collection and the number of case studies can be increased. When the monitoring has been improved, it will be possible to make a judgment about the effect of the work of the community sport coaches on the total of memberships and sport participation in the population.
- To achieve a valid judgement of the effects of the policies it is important to define clear indicators for success. Furthermore, it is important to investigate the validity of these indicators. This kind of effect measurement will require efforts, however they will provide significant information for creating successful future policy.
- Governmental policy is important but, the implementation of most of the policies is done by each province or municipality. Not every municipality has the same concerns or might choose the same approach for implementation of policies. Therefore policies should be adjusted locally and provinces, municipalities and cities with the same concerns must be able to help each other.
- A better collaboration between government and non-government initiatives could be helpful in providing a more complete sports offer for disabled children. Non-government initiatives, such as foundations, are very important for providing sports opportunities for disabled children, probably even more than in regular sports. Foundations like this have a major influence on the image disabled as well as non-disabled people have of disabled sports.
- Integrate objective measures of physical activity in future national monitors, among youth with a disability as well. The information of these measures will be valuable, in addition to the information from questionnaires.
- The representativeness of youth with a disability should be improved in national monitoring. Subgroups (with subdivisions to age, degree of urbanization, social economic status and such) should be well represented as well.
- Stimulate the use of acknowledged interventions for the target group youth with a disability. Not everyone has to re-invent the wheel. See: <https://www.allesoversport.nl/artikel/erkende-interventies-gericht-op-sportstimulering-voor-mensen-met-een-beperking/>
- Establish a regional collaboration. See: <https://www.allesoversport.nl/artikel/hoe-zet-je-regionale-samenwerking-op/>

Research Gaps

- As stated in the recommendations, more information about the effects of used interventions is needed. More detailed monitoring on the effects of governmental interventions is desirable. Do the policies contribute effectively to a more physically active youth? This information is important for the content and costs of future policies.
- More information is needed about the policies and opportunities per target group. Many policies and foundations focus on a specific group, for example children with a physical disability. It is not very clear which groups need more attention and how effective the different policies are for different groups. In other cases it is not specific enough. Children with a physical disability do not have the same demands as children with a mental disability. However, many policies only mention 'disabled children'.
- More insight is needed in the distribution of sports opportunities in the Netherlands. As mentioned in the recommendations, non-government organizations are important in providing sports and physical activity opportunities for disabled children. Some of these organizations cover the entire country, but there are also many organizations that only operate in a certain region. Currently, it is not clear how the initiatives are spread over the country and if, for example, children from rural areas have the same opportunities as children from urban areas.

Comparison results of the Report Card and Report Card+



In 2016, the results of the Report Card for typically developing children were published, consequently it is possible to compare the results of this Report Card+ and the Report Card.

Behaviors that contribute to overall physical activity levels

When assessing the total of children with and without a disability who meet the Dutch Guidelines for Physical Activity (NNGB), no differences emerge. Unfortunately, only about a quarter of the Dutch youth with or without a disability moves and exercises sufficiently every day.² Drastic interventions to increase this grade are very necessary.

When assessing the other behaviors that contribute to overall physical activity levels, we see that many children with a disability walk or cycle to school at least 3 times per week, though, this is almost 10% less compared to the active transport behavior in typically developing children.² Besides, not even a third of the scholars in special education walks or cycles to school.³

Regarding sports participation, the differences are small when comparing the overall results for children with a disability in general (results RIVM monitor) with the results of typically developing children. In special education on the other hand, only a maximum of 45% of the scholars engages in sports at least once a week.

In active play behavior and sedentary behavior no remarkable differences between the typically developing youth and youth with a disability emerge.

Settings and sources of influence

Unfortunately, with regard to the factors of influence in the physical activity behavior, we have to conclude that for all indicators it was not possible to give a suitable grade, due to insufficient representative data concerning youth with a disability.

What stands out the most among this group of indicators, is that (parents of) children with a disability do not particularly report environmental barriers or accessibility as a main problem, but social accessibility seems to more of an issue. Children with a disability and their parents still experience that they are not completely accepted in sport clubs or mention that the staff and volunteers of the clubs are not well informed enough or have insufficient knowledge of the condition and/or disability.

Government and non-governmental organizations

The grades of both youth with and without a disability showed that the current policy of the government could not be judged.

There are several initiatives that have to result in a more physically active youth, with as well as without a disability. Unfortunately, no clear criteria and monitors are present to evaluate the effectiveness of these initiatives and policies.

With regard to foundations, we see that proportionally more foundations are founded to help or facilitate children with a disability in their possibilities to play sports or exercise, compared to foundations for typically developing children.

Conclusion

When taking all the results into account, we see that in overall physical activity levels no differences between the groups exist. Small differences in the active transport behavior are present, but for the other indicators related to physical activity no large differences emerged. The situation among scholars attending special schools showed however that less scholars meet the norms or established criteria.

(Social) accessibility and the diversity of the youth with a disability are most likely the most influential factor for these differences. However, it is hard to make a strong statement about this, because currently the national monitoring in children with a disability is lacking.

Overview & Conclusion

The aim of this Report Card⁺ was to provide an overview of the methods and results of the first Dutch Report Card⁺ for youth with a disability.

The results showed that about a quarter of the Dutch youth with a disability meets the physical activity norm.

Other indicators for which improvement is warranted are sedentary behavior and active play. The Dutch youth with a disability spends a large part of the day sitting or lying and/or behind a screen, especially during school times. Though, around half of the disabled children engaged in daily active play for at least 60 minutes, the other half does not. Thus, changing the behaviors regarding, sitting (at school), screen time and active play, seems the ones of which it is very plausible to improve overall activity levels.

Fortunate, a large part of the youth with a disability engages in sports weekly and chooses an active mode of transportation for their way to school. It is important that the conditions for these indicators won't deteriorate. Solutions should be developed to make it possible for more scholars in special schools to go to school (partly) physically active and sport clubs need facilitation for their staff and volunteers to educate them more properly so children and their parents experience less of a threshold to join a sports club.

The role of the parents and family is also in this group of children of high importance. Even though no grade could be assigned to this indicator, results demonstrated that parents should be more informed about their large influence as role model for all behaviors and that their home rules are of high relevance as well.

Stimulating parents to engage in sports and/or exercise activities with their whole family should be more promoted. In addition, the strategies to introduce sports offers for children with a disability, other sports and play activities in the neighborhood, as the foundations who can help families with less financial back up, should be improved. Currently, too many parents are not familiar with these possibilities and sports offers.

As mentioned before, the youth with a disability are sitting the most during school hours. Strategies to interrupt the long sitting duration should be developed and implemented. As school is the place where all the children can be reached, strategies and financial resources are needed to enlarge durations of the PE lessons and to realize higher intensities during these PE lessons.

Further, collaborations between all sectors should be stimulated. Problems in accommodations and the offer of sports- and other active activities will benefit from this. Furthermore, it is important to involve parents, PE specialists and teachers in realizing and improving the sports offer for children with a disability. Both parents and teachers know the child and his/her possibilities and disabilities the best and can search together with the sports clubs for the most appropriate sports activity.

Together, the results show that many initiatives have been undertaken in the Netherlands. Though the youth with a disability is so diverse, that it is not easy for all groups to participate in sports and exercise activities. Compared to their typically developing peers, no difference in meeting the physical activity recommendations are found, but still only 26% of the youth with a disability (4-17 years) engages at least daily in 60 minutes of moderate-to-vigorous activity.

Next to environmental barriers, barriers concerning (social) accessibility are present.

Strengths and limitations |

This is the first Dutch Physical Activity Report Card⁺. The Report Card provides a comprehensive overview about how the Netherlands is doing, regarding physical activity opportunities, overall physical activity levels and the role of sources of influence for children with a chronic disease or disability.

One of the strengths of this Report Card, is the participation of many experts and organizations in this area, which made that many important data sources were identified and included. Unfortunately, not all indicators are integrated in national surveys yet (e.g. family and peers) and in the national surveys no clear demarcation is present for children with a disability. No subcategories could be made and the size of the research population is small. Furthermore, only the data of 2015 from the RIVM monitor could be used because the sample sizes in the years 2011-2014 were too small. With this in mind, one can question if these results actually represent the current situation for people with a disability and youth in particular? Making appropriate policies based on the results of this monitoring should be therefore questioned.

Hopefully, future national monitoring will subject some changes. A suggestion is to integrate subcategories as or not wheelchair dependent and to include special schools as well.

For active play, sedentary behavior, sleeping behavior and government strategies still no established criteria for the definition, measurements and benchmark or its relationship with health exist. This needs further national and international discussion and consensus. As reported in the Report Card for typically developing children, the Health Council of the Netherlands (commissioned by the Minister of Health, Welfare and Sports) is evaluating already and if necessary will adjust the current physical and sedentary guidelines based on recent scientific insights.¹⁰² Self-report and/or parent-report was applied in almost all surveys, however, the (possible) discrepancy for these subjective methods and objective/direct measurements is under discussion. Thus, this needs further scientific exploration as well.

Conclusion |

Based on the results of this Physical Activity Report Card⁺, the Netherlands is on track, but currently the Dutch youth with a disability is not able to participate completely unlimited in sports and exercise.

Further Information

<https://www.activehealthykids.nl>
<https://www.activehealthykids.org>
<https://www.allesoversport.nl>
<https://volksgezondheidensport.info/kerndindicatoresport>



Summary of Indicators & Grades for youth with a disability

Behaviors that contribute to overall physical activity levels

1. Overall Physical Activity

- % Youth with a disability who meets the Dutch Norm for Physical Activity (NNGB; to be at least moderate active (from 5 MET) for at least 60 minutes a day).

Grade

D

2. Organized Sport Participation

- % Youth with a disability who participates in organized sport and/or physical activity programs weekly

Grade:

B-

3. Active Play

- % Of youth with a disability who engages in unstructured/unorganized active outside play in the last week

Grade:

C-

4. Active Transportation

- % Of youth with a disability who uses active transportation (walking or cycling) to get to and from places (school and/or work) at least three times a week

Grade:

A-

5. Sedentary Behaviors

- % Of youth with a disability who engages in no more than 2 hours of screen time per day

Grade:

C

6. Sleep

- % Of youth with a disability meeting the guidelines for sleep (4-11 year 9-11 hours/night; 12-17 year 8-10 hours/night)

Grade:

C

Additional indicators

7. Weight Status

- % Of youth with a disability with a normal bodyweight (a normal weight is classified when the BMI is between 18.5 and 25 kg/m²)

Grade:

INC

Settings & Sources of influence

8. Family & Peers

- % Of parents who facilitate physical activity and sport opportunities for their children (e.g. volunteering, coaching, driving, paying for memberships fees and equipment).
- % Of parents who meet the Dutch Norm for Physical Activity for adults (NNGB; to engage in at least 30 minutes of moderate physical activity for at least 5 days a week)
- % Of parents who are physically active with their kids
- % Of youth who encourages and support their friends and peers to be physically active.

Grade:

INC

9. School

- % of schools with an active school policy (e.g. offering sports- and exercise activities next to PE or activities during recess, collaborates with community's and/or sport clubs, presence of annual planning)
- % of schools with a PE specialist
- % of schools where the students have at least 90 minutes of PE per week
- % of students who have at least 45 minutes of outside play time during school for 5 days per week.

Grade:

INC

10. Buurt & Gebouwde Omgeving

- % Of children and parents who perceive their community/municipality is doing a good job at promoting physical activity (e.g. variety, location, cost quality)
- % Of communities/municipalities that report they have policies promoting physical activity
- % Of communities/municipalities that report they have infrastructure (e.g. sidewalks, trails, paths, bike lanes) specifically geared toward promoting physical activity
- % Of children or parents who report having facilities, programs, parks and playgrounds available to them in their community
- % Of children or parents who report living in a safe neighborhood where they can be physically active
- % Of children with a disability who report having well-maintained facilities, parks and playgrounds in their community that are safe to use
- % Of children and parents who report that in organizations like sports clubs, they (their child) are socially accepted and that social accessibility is present.

Grade:

INC

Government & Non-Government

- Evidence of leadership and commitment in providing physical activity opportunities for all children and youth
- Allocation of funds and resources for the implementation of physical activity promotion strategies and initiatives for all children and youth
- Demonstrated progress through the key stages of public policy making (i.e. policy agenda, policy formation, policy implementation, policy evaluation and decisions about the future)

Cijfer:

INC

Grades

A	The Netherlands is succeeding with a large majority with a large majority (81-100%) of children and youth.
B	The Netherlands is succeeding with well over half (61-80%) of children and youth.
C	The Netherlands is succeeding with about half (41-60%) of children and youth.
D	The Netherlands is succeeding with less than half (21-40%), but some, children and youth.
F	The Netherlands is succeeding with very few (0-20%) children and youth.
INC	Incomplete. Not enough available evidence to assign a grade to the indicator or absence of clear well-established criteria.
-	% Scholars in special schools meeting the norms or establish criteria, is lower than among the general youth with a disability .



Abbreviations

BMI	=	Body Mass Index
CBS	=	Statistics Netherlands [Centraal Bureau voor de Statistiek]
CP	=	Cerebral Palsy
ECS	=	Education, Culture and Science
HWS	=	Health, Welfare and Sports
KSC	=	Knowledge Centre for Sport Netherlands [Kenniscentrum Sport]
MET	=	Metabolic Equivalent
MVPA	=	moderate-to-vigorous activity
NNGB	=	Dutch Physical Activity Guideline [Nederlandse Norm Gezond Bewegen]
NOC*NSF	=	Dutch Olympic Committee* Dutch Sports Confederation [Nederlands Olympisch comite * Nederlandse Sport Federatie]
PE	=	Physical Education
QoL	=	Quality of Life
RIVM	=	National Institute for Public Health and the Environment [Rijksinstituut voor Volksgezondheid en Milieu]
SB	=	Spina Bifida
SBB	=	Sport and Exercise close to home [Sport en Bewegen in de buurt]
SES	=	Social Economic Status
WHO	=	World Health Organization

References

- Colley RC, Brownrigg M, Tremblay MS. A model of knowledge translation in health: the active healthy kids Canada report card on physical activity for children and youth. *Health Promot Pract*. 2012;13:320-330.
- Van den Berg S, Vos W. Health Survey /Life style monitor [Gezondheidsenquête/Leefstijl monitor] 2015. The Hague and Utrecht, the Netherlands: Statistics Netherlands in collaboration with the National Institute for Public Health and the Environment;2015. Obtained from www.leefstijlmonitor.nl.
- von Heijden A, van den Dool R, van Lindert C, Breedveld K. (Un)limited sportive. Monitor physical activity and sport participation of people with a disability. [(On)beperkt sportief. Monitor sport- en beweegdeelname van mensen met een beperking]. Utrecht: Mulier Institute;2013.
- van Lindert C, Bruining J-W, Smits F, Nootebos W. Monitor Special Heroes in cluster 4. Ending situation of participating cluster 4 schools and their students. [Monitor Special Heroes in cluster 4. Eindsituatie van deelnemende cluster 4 scholen en hun leerlingen]. Utrecht: Mulier Institute;2013.
- van den Dool R, van Lindert C, Smits F, Breedveld K. Monitor Special Heroes in cluster 3. End situation of participating cluster 3 schools and their students. [Monitor Special Heroes in cluster 3. Eindsituatie van deelnemende cluster 3 scholen en hun leerlingen]. Utrecht: Mulier Institute;2013.
- Organisation of special education. [Organisatie van het speciaal onderwijs]. <https://www.rijksoverheid.nl/onderwerpen/passend-onderwijs/inhoud/speciaal-onderwijs>. Accessed April 7, 2017.
- World Health Organization. Global Status Report on non communicable disease 2010. Geneva: World Health Organization;2011.
- Janssen I, LeBlanc AG. Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. *Int J Behav Nutr Phys Act*. 2010;7:1-16.
- Bailey R, Hillman C, Arent S, Petitpas A. Physical activity: an underestimated investment in human capital? *J Phys Act Health*. 2013;10(3):289-308.
- Bloemen MA, Backx FJ, Takken T, et al. Factors associated with physical activity in children and adolescents with a physical disability: a systematic review. *Dev Med Child Neurol*. 2015;57(2):137-148.
- King G, Law M, King S, Rosenbaum P, Kertoy MK, Young NL. A conceptual model of the factors affecting the recreation and leisure participation of children with disabilities. *Phys Occup Ther Pediatr*. 2003;23(1):63-90.
- Murphy NA, Carbone PS. Promoting the participation of children with disabilities in sports, recreation, and physical activities. *Pediatrics*. 2008;121(5):1057-1061.
- Wilson PE, Clayton GH. Sports and disability. *PM & R : the journal of injury, function, and rehabilitation*. 2010;2(3):S46-54; quiz S55-46.
- Grondhuis SN, Aman MG. Overweight and obesity in youth with developmental disabilities: a call to action. *J Intellect Disabil Res*. 2014;58(9):787-799.
- McGillivray J, McVilly K, Skouteris H, Boganin C. Parental factors associated with obesity in children with disability: a systematic review. *Obes Rev*. 2013;14(7):541-554.
- Papas MA, Trabulsi JC, Axe M, Rimmer JH. Predictors of obesity US sample of high school adolescents with and without disabilities. *J Sch Health*. 2016;86(11).
- Brown CL, Irby MB, Houle TT, Skelton JA. Family-based obesity treatment in children with disabilities. *Acad Pediatr*. 2015;15(2):197-203.
- Health behaviour in school-aged children, survey data, The Netherlands.
- Bos GJ, Lelieveld OT, Armbrust W, Sauer PJ, Geertzen JH, Dijkstra PU. Physical activity in children with Juvenile Idiopathic Arthritis compared to controls. *Pediatr Rheumatol Online J*. 2016;14(1):42.
- Van Wely L, Balemans AC, Becher JG, Dallmeijer AJ. Physical activity stimulation program for children with cerebral palsy did not improve physical activity: a randomised trial. *J Physiother*. 2014;60(1):40-49.
- Bloemen MAT, vd Berg-Emons RHJG, Tuijt M, et al. Physical Behavior in Wheelchair-using youth with Spina Bifida, An Observational Study. Submitted, 2017.
- Verschuren O, Lesley W, Hermans D, Ketelaar M. Identification of facilitators and barriers to physical activity in children and adolescents with Cerebral Palsy. *J Pediatr*. 2012;161:488-494.
- Leemrijse CJ, Schoenmakers TM. Knowledge synthesis sport and physical activity for people with a physical disability: useful and effective? [Kennissynthese sport en bewegen voor mensen met een lichamelijke handicap: zinvol en effectief?]. Utrecht: Nivel;2015.
- Kotte EM, de Groot JF, Winkler AM, Huijgen BC, Takken T. Effects of the Fitkids exercise therapy program on health-related fitness, walking capacity, and health-related quality of life. *Phys Ther*. 2014;94(9):1306-1318.

25. Zwier JN, van Schie PE, Becher JG, Smits DW, Gorter JW, Dallmeijer AJ. Physical activity in young children with cerebral palsy. *Disabil and Rehabil.* 2010;32(18):1501-1508.
26. Cevaal A, van Lindert C, Romijn D. Special Heroes from the point of view of sports associations. [Special heroes gezien vanuit sportaanbieders.]. Utrecht: Mulier Institute;2012.
27. Notté R, van Kalmthout J, van Lindert C. Monitor integration of disabled sports in regular sport federations. [Monitor integratie van gehandicaptensport binnen reguliere sportbonden]. 's-Hertogenbosch: Mulier Institute;2011.
28. Jaarsma EA, Dijkstra PU, de Blecourt AC, Geertzen JH, Dekker R. Barriers and facilitators of sports in children with physical disabilities: a mixed-method study. *Disabil Rehabil.* 2015;37(18):1617-1623.
29. Baken W. Annual Report 2014. [Jaarverslag 2014.]. Bunnik: Stichting Onbeperkt Sportief;2015.
30. Bult MK, Verschuren O, Jongmans MJ, Lindeman E, Ketelaar M. What influences participation in leisure activities of children and youth with physical disabilities? A systematic review. *Res Dev Disabil.* 2011;32(5):1521-1529.
31. Pratt B, Hartshorne NS, Mullens P, Schilling ML, Fuller S, Pisani E. Effect of Playground Environments on the Physical Activity of Children With Ambulatory Cerebral Palsy. *Pediatr Phys Ther.* 2016;28(4):475-482.
32. Takken T, Burghard M, Knittel K, van Oost I. Physical Activity Report Card 2016. Utrecht;2016.
33. van Lindert C, van den Dool R. Monitor Special Heroes in cluster 3 schools. Start situation of participating cluster 3 schools and their students. [Monitor Special Heroes in cluster 3 scholen. Startsituatie van deelnemende cluster 3 scholen en hun leerlingen.]. Utrecht: Mulier Institute;2011.
34. Nooijen CF, Slaman J, Stam HJ, Roebroek ME, Berg-Emons RJ. Inactive and sedentary lifestyles amongst ambulatory adolescents and young adults with cerebral palsy. *J Neuroeng Rehabil.* 2014;11:49.
35. Hendriksen IJM, Bernaards CM, Commissaris DACM, Proper KI, Van Mechelen W, Hildebrandt VH. Position Statement. Prolonged sitting: a new threat for your health. [Langdurig zitten: een nieuwe bedreiging voor uw gezondheid] TSG. 2013;91(1):22-25.
36. Ryan JM, Forde C, Hussey JM, Gormley J. Comparison of patterns of physical activity and sedentary behavior between children with Cerebral Palsy and children with typical development. *Phys Ther.* 2015;95(12).
37. Izquierdo-Gomez R, Veiga OL, Villagra A, Diaz-Cueto M. Correlates of sedentary behaviour in youths with Down syndrome: the UP&DOWN study. *J Sports Sci.* 2015;33(14):1504-1514.
38. Walker RG, Obeid J, Nguyen T, et al. Sedentary time and screen-based sedentary behaviors of children with a chronic disease. *Pediatr Exerc Sci.* 2015;27(2):219-225.
39. Hirshkowitz M, Whiton K, Albert SM, et al. National Sleep Foundation's sleep time duration recommendations: methodology and results summary. *Sleep Health.* 2015;1(1):40-43.
40. Keyes KM, Maslowsky J, Hamilton A, Schulenberg J. The great sleep recession: changes in sleep duration among US adolescents, 1991-2012. *Pediatrics.* 2015;135(3):460-468.
41. Kjeldsen JS, Rosenkilde M, Nielsen SW, et al. Effect of different doses of exercise on sleep duration, sleep efficiency and sleep quality in sedentary, overweight men. *Bioenergetics.* 2013;2:108.
42. Paruthi S, Brooks LJ, D'Ambrosio C, et al. Consensus Statement of the American Academy of Sleep Medicine on the Recommended Amount of Sleep for Healthy Children: Methodology and Discussion. *J Clin Sleep Med.* 2016;12(11):1549-1561.
43. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4 ed. Washington, DC: Author; 2000.
44. Liu X, Hubbard JA, Fabes RA, Adam JB. Sleep disturbances and correlates of children with autism spectrum disorders. *Child Psychiatry Hum Dev.* 2006;37(2):179-191.
45. Owens JA, Maxim R, Nobile C, McGuinn M, Msall M. Parental and self-report of sleep in children with attention-deficit/hyperactivity disorder. *Arch Pediatr Adolesc Med.* 2000;154(6):549-555.
46. Moreau V, Rouleau N, Morin CM. Sleep of children with attention deficit hyperactivity disorder: actigraphic and parental reports. *Behav Sleep Med.* 2014;12(1):69-83.
47. Strine TW, Chapman DP. Associations of frequent sleep insufficiency with health-related quality of life and health behaviors. *Sleep medicine.* 2005;6(1):23-27.
48. Guideline diagnostics and treatment of obesity in adults and children. [Richtlijn Diagnostiek en behandeling van obesitas bij volwassenen en kinderen]. Utrecht: Quality institute for healthcare. [Kwaliteitsinstituut voor de gezondheidszorg (CBO)];2008.
49. About Fitkids. [Over Fitkids]. https://www.fitkids.nl/5/over_fitkids.html. Accessed April 4, 2017.
50. Fitkids data retrieved from Elles Kotte.
51. McPherson AC, Swift JA, Peters M, et al. Communicating about obesity and weight-related topics with children with a physical disability and their families: spina bifida as an example. *Disabil Rehabil.* 2016;39(8):791-797.
52. Pascoe J, Thomason P, Graham HK, Reddihough D, Sabin MA. Body mass index in ambulatory children with cerebral palsy: A cohort study. *J Paediatr Child Health.* 2016;52(4):417-421.
53. Bandini L, Danielson M, Esposito LE, et al. Obesity in children with developmental and/or physical disabilities. *Disabil Health J.* 2015;8(3):309-316.

54. Volksgezondheidsmonitor: Municipality Utrecht, data of Youth Healthcare Utrecht [Jeugdgezondheidszorg]. Utrecht 2014-2015.
55. van Bakel E, Moresi S, Borghouts L, van Lindert C. Parent involvement. [Ouderbetrokkenheid]. Utrecht: Fontys Sports College/Mulier Institute;2013.
56. Milder IEJ, Cloostermans L, van den Dool R, Preller L, Wendel-Vos GCW. Environmental and financial determinants of sports, movement and sedentary behavior. [Ruimtelijke en financiële determinanten van sporten, bewegen en sedentair gedrag]. Bilthoven: RIVM;2012.
57. Bloemen MA, Verschuren O, van Mechelen C, et al. Personal and environmental factors to consider when aiming to improve participation in physical activity in children with Spina Bifida: a qualitative study. BMC Neurol. 2015;15:11.
58. Martin JJ, Choi YS. Parents' physical activity-related perceptions of their children with disabilities. Disabil Health J. 2009;2(1):9-14.
59. Piskur B, Beurskens AJ, Jongmans MJ, Ketelaar M, Smeets RJ. What do parents need to enhance participation of their school-aged child with a physical disability? A cross-sectional study in the Netherlands. Child Care Health Dev. 2015;41(1):84-92.
60. Lucassen J, Ceva A, Scholten V, van der Werff H. Physical education in special and vocational education, baseline measurement 2015. [Bewegingsonderwijs in het speciaal onderwijs en praktijkonderwijs, nulmeting 2015]. Utrecht: Mulier Institute;2016.
61. GGD Vignet Gezonde School. Vignette Healthy School [Vignet Gezonde School]. Healthy School [Gezonde School]. Received from van Halteren S, March 3, 2016
62. Dopheide M, Lucassen J, van Lindert C. Appropriate education act in physical education. [Wet passend onderwijs in het bewegingsonderwijs]. Utrecht: Mulier Institute;2015.
63. Einarsson I, Johannsson E, Daly D, Arngrimsson SA. Physical activity during school and after school among youth with and without intellectual disability. Res Dev Disabil. 2016;56:60-70.
64. Sports provider Monitor. Data of Sports Provider monitor. Received from NOC*NSF; 2015.
65. van der Poel H, Wezenberg-Hoenderkamp K, Hoekman R. Sports facilities in the Netherlands, maps and key figures. [Sportaccommodaties in Nederland, kaarten en kerngetallen]. Utrecht: Mulier Institute;2016.
66. Future Sports Policy. [Toekomstig sportbeleid] The Hague: House of Representatives [Tweede Kamer der Staten-Generaal] 2014-2015;; 2014.
67. Sport for disabled people policy letter. [Kamerbrief: Beleid omtrent gehandicaptensport]. The Hague: Ministry of Health Welfare and Sports;; 2015.
68. van Lindert C, Terpstra N, Pulles I, Schootemeijer S. Sport policy for disabled people in local authorities and provinces. [Gehandicaptensportbeleid in gemeenten en provincies.]. Utrecht: Mulier Institute;2016.
69. Pulles I, van Lindert C, van der Poel H. Progress report Monitor Sport and Exercise close to home 2015. [Voortgangsrapportage Monitor Sport en Bewegen in de Buurt 2015.]. Utrecht: Mulier Institute;2015.
70. The strength of 'neighbourhood sport coaches' and 'combination functionaries'. [De kracht van buurtsportcoaches en combinatiefunctionarissen.]. Bunnik: Ministry of Health Welfare and Sport; 2015.
71. Elaboration sports note 2012-2014. [Uitwerking sportnotitie 2012-2014]. Groningen: Province Groningen;2014.
72. Schapendonk R, van den Berg L, van den Dool R, Hoenderkamp K, Hoffmans W, van Lindert C. Municipal Disabled Sports Match. [Gemeentelijke Sportmatch Gehandicaptensport] Utrecht: Mulier Institute/Unlimitive Sportive Fund;2013.
73. van Aller H, Haak A, van Lindert C, Pulles I. Municipal Disabled Sports Match Amsterdam. [Gemeentelijke Sportmatch Gehandicaptensport Amsterdam] Utrecht: Mulier Institute/Unlimitive Sportive Fund;2015.
74. Tuinenberg I, Westerlaken A. Annual Report 2015. [Jaarverslag 2015]. Amsterdam: NSGK;2015.
75. Romijn D, Ceva A, van de Lindert C. Sport project for youth with a disability appreciated. [sportprojecten voor jeugd met beperking op waarde geschat.]. Utrecht: Mulier Institute;2011.
76. Cruyff Foundation. Annual check [Jaarrekening]. 2016; <http://www.cruyff-foundation.org/jaarverslagen/>. Accessed 6 october, 2016.
77. Sport for disabled people national. [Gehandicaptensport nationaal]. <http://www.cruyff-foundation.org/gehandicaptensport/nationaal/>. Accessed October 13, 2016.
78. Strategic policy plan 2013-2015. [Strategisch beleidsplan 2013-2015.]. Arnhem: Esther Vergeer Foundation;2013.
79. Annual Report 2014-2015. [Jaarverslag 2014-2015.]. Arnhem: Esther Vergeer Foundation;2015.
80. Mission [Missie]. 2017; <http://mentalityfoundation.org/missie/>. Accessed March 16, 2017.
81. What is the Playground gang? [Wat is de Speeltuinbende?]. <http://www.speeltuinbende.nl/wat-is-de-speeltuinbende>. Accessed March 14, 2017.
82. van der Put I, van Term L. Playfully to the future, Policy Summary Playground gang 2016-2018 [Spelenderwijs de toekomst in, Samenvatting Beleidsplan Speeltuinbende 2016-2018]. Arnhem: Playground gang [Speeltuinbende];2016.
83. Help make sports clubs accessible. [Help mee sportverenigingen toegankelijk maken]. 2014; <https://www.nsgk.nl/actueel/nieuwsarchief/archief-bericht/?bericht=help-mee-sportverenigingen-toegankelijk-maken>. Accessed 14 march, 2017.
84. Foppe Foundation. Goal. [Foppe Fonds. Doel]. <http://www.foppefonds.nl/over-ons/onze-missie/>. Accessed March 16, 2017.

85. Sports, playing and moving for every child. [Sporten, spelen en bewegen voor ieder kind]. http://www.kidszwolle.nl/cgi-bin/v14/view.pl?db=website&view_records=1&ww=1&ID=1000. Accessed March 16, 2017.
86. Friends of KIDS: if you are looking for a charity in Zwolle. [Vrienden van KIDS: als u op zoek bent naar een goed doel in Zwolle]. http://www.kidszwolle.nl/cgi-bin/v14/view.pl?db=website&view_records=1&ww=1&ID=2036. Accessed March 16, 2017.
87. The origin of Kids United. [Het ontstaan van Kids United]. <https://www.kids-united.nl/het-ontstaan-van-kids-united/>. Accessed March 16, 2017.
88. Happy2Move Home. <http://www.happy2move.nl/index.php>. Accessed March 14, 2017.
89. Happy2Move Costs [Kosten]. http://www.happy2move.nl/happy2move_kosten.php Accessed March 14, 2017.
90. Only Friends, about us [Over ons]. <https://onlyfriends.nl/only-friends/>. Accessed March 16, 2017.
91. Been HM, Bolhuis JHA, Eurlings CMPS, et al. Financial Annual Report NOC*NSF 2015. [Financieel jaarverslag NOC*NSF 2015]. Arnhem: NOC*NSF;2016.
92. Disabled Sport in NL. <https://www.nocnsf.nl/en/nocnsf/disabled-sport-in-nl/disabled-sport-in-nl>. Accessed March 7, 2017.
93. Annual report Association sports for disabled people The Netherlands. [Jaarverslag Vereniging Gehandicaptensport Nederland.]. Nieuwegein: Gehandicaptensport Nederland;2016.
94. Foundation for Disabled Sports. What do we stand for? [Fonds Gehandicaptensport. Waar staan we voor?]. <http://www.fondsgehandicaptensport.nl/waarstaanwevoor>. Accessed March 7, 2017.
95. Annual report 2015. Attachment 5, multi-annual budget 2014-2016. [Jaarrapport 2015. Bijlage 5, meerjarenbegroting 2014-2016]. <http://jaarverslagen.fondsgehandicaptensport.nl/2015/bijlagen/bijlage-5>. Accessed March 7, 2017.
96. Sport Uniquely . About us. [Uniek Sporten. Over ons]. <https://www.unieksporten.nl/over-ons>. Accessed March 7, 2017.
97. Driebergen Accountants. Annual check 2015. [Jaarrekening 2015.]. Katwijk: Dirk Kuyt Foundation;2014.
98. Dirk Kuyt Foundation. About us. [Over ons]. <http://www.dirkkuytfoundation.nl/over-ons/>. Accessed October 13, 2016.
99. Annual report 2015. Youth Sports Fund. [Jaarverslag 2015. Jeugsportfonds]. Amsterdam: Youth Sports Fund. [Jeugsportfond];2016.
100. Youth Sports Fund. About us. [Jeugsportfonds. Over ons.]. <https://www.jeugsportfonds.nl/over/>. Accessed March 9, 2017.
101. Play Sports without Limits App free to download. App sportdrempelvrij gratis te downloaden. 2015; <http://www.mulierinstituut.nl/actueel/nieuws/app-sportdrempelvrij-gratis-te-downloaden/>). Accessed 9 March, 2017.
102. Everything about sports. [Alles over sport]. How much should you exercise according to the physical activity guideline? [Hoeveel moet je bewegen volgens de beweegnorm?]. December 17, 2015; <https://www.allesoversport.nl/artikel/hoeveel-moet-je-bewegen-volgens-de-beweegnorm/>. Accessed May 10, 2016.



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