SUMMARY

Promoting children’s physical activity behaviour

Regular physical activity (PA) is associated with a decreased risk of physical and mental health problems and can prevent overweight and obesity. Dutch children living in socioeconomically deprived areas seem to have the lowest levels of PA and the highest rates of overweight. The determinants of children’s PA are complex and interrelated. Accordingly, local preventive intervention requires multilevel and multi-sectoral preventive strategies and demands a careful coordinated planned approach. In 2002 the municipality of Amsterdam started the development of JUMP-in, a primary-school-based multi-level intervention. JUMP-in aimed to promote sports participation and PA behaviour and reduce sedentary time among children in economically deprived areas. JUMP-in was evaluated on a continuous basis and on a variety of levels to determine its positive impact on its participants. This thesis describes the stepwise development, effectiveness and feasibility of the JUMP-in intervention.

The stepwise development of JUMP-in

The JUMP-in development process consisted of several stages: 1) development and pilot test from 2002 to 2004; 2) translation of pilot outcomes into an improved programme and study design in 2005; 3) wide scale implementation and evaluation in 2006 to 2009, and; 4) revision and institutionalisation from 2010 to 2012. Chapter 2 presents the description of step 2, in which the lessons learned in the pilot period were translated into an improved programme, using the RE-AIM framework (Reach, Efficacy, Adoption, Implementation and Maintenance). Weaknesses concerning the pilot programme were the fact that school sports clubs especially reached already active children and the lack of attention to hampering factors at the individual level such as being overweight or having motor developmental problems. Furthermore it was clear that, to implement and embed the programme in daily practice and policy, highly structured cooperation was required between municipal authorities, local city districts, schools, child health care and local sports clubs, aiming at effective local planning and action. The RE-AIM framework appeared a useful guide in combining the pilot process- and effect outcomes and translating them into improved intervention methods, delivery strategies and planning procedures.

The improved intervention consisted of school sports clubs, regular physical activity breaks during normal lessons, and workbooks with assignments to perform in class and at home. Parents were offered information, meetings, courses and sports activities. Inactive children and children with overweight or motor problems were detected by the JUMP-in pupil monitoring system and referred to tailored interventions or Child Health Care.

Effectiveness of JUMP-in

Chapter 3 presents the results of the controlled trial we carried out to evaluate the effectiveness of the JUMP-in intervention. Nine intervention schools and ten comparable control schools were recruited from geographically separated city districts. Measures were performed among 2848
children aged 6 to 12 years, at the beginning of the first school year (T0: 2006) and repeated at the end of the first (T1: 2007) and second school year (T2: 2008). To estimate the effect of the intervention we used linear and logistic multilevel auto regression analyses. A significant beneficial intervention effect was found on sports participation. Effects were stronger for girls and for Moroccan and Turkish children. Participation in organised sports was associated with increased aerobic fitness. We found no significant intervention effects on overall daily PA rates, outdoor play or screen behaviours. As leisure time PA behaviours typically take place after school, a combination of school-based and community-based intervention strategies involving the social and physical home environment may be needed to improve these behaviours as well.

We found no significant intervention effect on body composition. This may be explained by the fact that JUMP-in was primarily aimed at PA behaviour and did not include dietary behaviour, or may be due to a lack of longer term follow-up measurements. To offer overweight children tailored care, the JUMP-in pupil monitoring system was developed, and children who were classified as overweight or obese were given a modified sports programme or were referred to suitable care.

Mediating effects on changes in sport participation, outdoor play and screen behaviours.
In chapter 4 we explored the intervention effect on potential mediators that were hypothesised to be causally related to sports participation and PA behaviour (i.e. attitude, self-efficacy, habit strength, social support and social norms) as well as mediating mechanisms. JUMP-in was not effective in changing the hypothesised mediators so no significant mediating mechanisms could be identified. However, changes in self-efficacy, social support and habit strength were positively associated with increased sport participation, and changes in social support, self-efficacy, perceived planning skills, enjoyment and habit strength were associated with increased outdoor play. Change in enjoyment was positively associated with changes in TV-viewing while parental rules were negatively associated. Having a computer in the bedroom and enjoyment were positively associated with increased computer use, while changes in parental rules were negatively associated.

The lack of an intervention effect on potential mediators may be due to unsuccessful intervention strategies, inappropriately implemented strategies, or inadequate measures of the cognitions. Additionally, the school setting may not be the sole channel to influence leisure time activities. Still, a number of constructs were associated with change in sport participation, outdoor play and screen behaviour and when successfully targeted may be potential mediators.

Sports participation and mental wellbeing
In chapter 5 we examined whether JUMP-in was effective in improving mental wellbeing. No significant intervention effect on indices of mental wellbeing (depression, perceived quality of life and perceived sports competence) was found. However, children who were active in sports during the whole follow-up period had significantly higher perceived sport competence and lower depression scores at follow-up compared to children who did not participate in sports.
at either time point. An explanation for the lack of effect in our study might be that we did not take into account the frequency, intensity and type of activity or the time that a child had participated in PA. Some children started participating in sports in the last months before the follow-up measurement. This may not have been long enough to show any effects yet.

Parents
From the beginning, parents were a JUMP-in target group, and the attention for their role and influence has increased over the years. Chapter 6 describes the effects of JUMP-in on parents’ cognitions towards children’s sports participation and whether parents’ cognitions mediated the JUMP-in intervention effect on sports participation. JUMP-in was effective in increasing parents’ social support and social pressure to encourage children to participate in sports. These determinants significantly mediated the intervention effect on sports participation. We found no significant intervention effect on parents’ perceived pros, self-efficacy, perceived sports competence, perceived barriers, planning skills or habit strength, while these hypothesised mediators were significantly associated with sports participation. Further, there was no intervention effect on intention, perceived cons, social modelling and social norm. These constructs were not significantly associated with sports participation either.

Process evaluation
In Chapter 7 we present the results of the JUMP-in process evaluation using a mixed-method approach including qualitative and quantitative data. We investigated factors influencing the adoption, implementation and institutionalisation process, in order to optimise the dissemination of the intervention and to improve its effectiveness. Our results show that JUMP-in has been successfully embedded in Amsterdam policy and in organisational structures of the sectors involved. The programme was generally delivered as planned, and its perceived importance and commitment among participants was high. All participants planned to continue the programme in the future. An impeding factor, however, was the complexity of the programme involving multidisciplinary collaboration. In addition, the process evaluation exposed some discrepancies between the prerequisites for effective innovation and the requirements for daily implementation. One example is the conflict between the need to tailor the intervention strategies to the local profile and local needs and the recommendation to standardise and simplify the innovation. Main recommendations for improving both effectiveness and implementation concerned enhanced information exchange, a stepwise implementation, synchronisation of tasks, planning schedules and protocols between collaborating organisations, and structural intervention support.

Main findings and implications for practice, policy and research
Chapter 8 discusses the main findings, identifies and discusses methodological issues and compares JUMP-in with similar school-based programmes. Additionally, implications and directions for further development of the JUMP-in intervention and the local public health practice and policies are discussed. Finally, recommendations for future research are proposed.