Four-year follow-up of the community intervention '10 000 steps Ghent'

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Abstract

The purpose of this study was to examine the 4-year follow-up effects of the '10 000 steps Ghent' project, which had shown increases in pedometer steps after the first year of implementation (2005–06). All adults who had participated in 2005–06 ($n = 866$) were recontacted in 2009 and invited to complete the International Physical Activity Questionnaire and a 7-day pedometer log. Long-term effects were analysed using repeated measures analysis of variance tests (time × community, $n = 420$). In subgroup analyses, age, gender, educational level, employment status, health and risk profile were also included. Results showed that daily step counts increased slightly from 2005 to 2009 in the intervention community (Ghent) and decreased in the comparison community (Aalst) (time × community: $P = 0.008$). Subgroup analyses showed a positive interaction effect for higher educated ($P = 0.026$) and healthy ($P = 0.005$) participants and a negative interaction for those with a poor to moderate health ($P = 0.026$). For self-reported physical activity, a positive interaction effect was found in those who had already reached 10 000 steps in 2005 ($P = 0.037$). To conclude, the positive effects seen after 1 year were not maintained after 4 years. However, a decrease from baseline to follow-up, which was seen in the comparison community, was prevented in all Ghent participants, except those with a poor to moderate health.

Introduction

Many studies have shown that regular physical activity is beneficial for health [1]. Therefore, international guidelines recommend that adults should achieve at least 30 min of moderate to vigorous intensity physical activity per day [2] or accumulate a minimum of 10 000 steps per day [3] in order to improve health and well-being. Still, the majority of the adult American (50%) [1] and European (60–80%) [4] populations do not meet these health-related physical activity guidelines and are consequently at higher risk of chronic diseases, such as cardiovascular diseases, obesity, type 2 diabetes, certain cancers and osteoporosis [5]. As a result, effective interventions for promoting (more) physical activity are needed.

Research in several countries has shown that community-based physical activity interventions that are guided by socioecological models of health behaviour can be effective [6]. Examples include whole community projects promoting pedometer use and step count increases, such as '10 000 steps Rockhampton' [7] and 'Canada on the Move' [8]. The European multistrategy project '10 000 steps Ghent' also showed significant intervention effects after 1 year [9]. This project was developed by the Department of Movement and Sports Sciences of Ghent University and implemented between 2005 and 2006 with the collaboration of the local community, i.e. city and provincial governments, three health insurance companies and the health promotion service.

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Several strategies were concurrently implemented at different socioecological levels (intrapersonal, interpersonal, organizational/institutional, community and social structure, policy and systems; see Table I). One-year follow-up results showed that average daily steps increased by almost 900 steps day^{-1} in the intervention community, while there was a slight decrease in the comparison participants' step counts. Significant intervention effects were also found for self-reported physical activity. A more precise description of the intervention development and implementation and a detailed overview of the results have been reported previously [9].

In order to achieve long-term health benefits, these positive changes in physical activity should be maintained over time. However, research has shown that individuals might revert to their previous, mostly inactive, routine, once the intensive intervention period is completed [10]. Moreover, in Ghent, as initially planned, the Department of Movement and Sports Sciences withdrew from further intervention implementation after the 1 year of intensive promotion (2005–06). During the period 2006–09, responsibility for the project was shifted to the local community and the campaign continued but in a less intensive manner (see Table I). The sale and loan of pedometers and the website were managed by the local community. Also, project features such as walking circuits in the parks and signs in public parking places remained in place. However, no new marketing strategies were implemented in Ghent.

Limited information is available about the long-term effects of physical activity interventions. A systematic review of 25 randomised controlled trials of at least 12-month duration in healthy adults was recently published [11]. Comprehensive and high-quality interventions using additional exercise prescriptions and booster strategies to reinforce initial intervention strategies were found to achieve the most substantial long-term increases in physical activity. However, the researchers concluded that additional studies are warranted to investigate the sustainability of physical activity interventions. While a review by Sharpe on community-based physical activity interventions concluded that long-term maintenance is often poor [12], there is little information about the long-term effects of whole community interventions using the '10 000 steps' concept. Therefore, the primary aim of the present study was to examine whether the positive effects of the '10 000 steps Ghent' intervention (2005–06) could be maintained after 4 years (2009). Firstly, the 4-year follow-up effects on pedometer-based and self-reported physical activity were examined for the total sample. Secondly, intervention effects were examined in different subgroups, defined on the basis of age, gender, educational level, employment status, health and risk profile (reaching 10 000 steps day^{-1} or not) at baseline. An additional aim was to describe long-term awareness of the project.

Methods

The methods used in this 4-year follow-up study were identical to those used in the 1-year follow-up study of the '10 000 steps Ghent' project [9].

Procedures

In 2009, three trained native speaking interviewers contacted all 25- to 75-year-old adults who participated in both the 2005 and the 2006 surveys [intervention community (Ghent): n = 440, comparison community (Aalst): n = 426] by telephone. During the interview, participants were asked to complete the long form International Physical Activity Questionnaire (IPAQ) and questions about awareness of the project. At the end of the interview, participants were requested to wear a pedometer for seven consecutive days and monitor their daily steps. After completion of the interview, a package was mailed to all participants. It contained a pedometer, a protocol describing how and when to use the pedometer [9], an activity log and a stamped addressed envelope for return mailing. At least three attempts by phone were made before someone was considered a 'non-completer' (i.e. they completed data assessments in 2005 and 2006 but not in 2009). No reminders were sent afterwards.

Table I. *Original and continued intervention strategies on the different socioecological levels*

Socioecological level	Original strategy in 2005–06: managed by the Ghent University, in collaboration with the local community	Continued strategy in 2006–09: managed by the local community
Intrapersonal	Local media campaign (press conferences, advertisements and billboards)	No
	Website use (www.10000stappen.be)	Yes
	Sale and loan of pedometers (+ step-count logs)	Yes
Interpersonal	Dissemination of information through all associations	No
	Project for older people (walk event in local park)	No
Organizational/institutional	Workplace projects (through health/personnel departments)	No
	Dissemination of information through health professionals	No
	Dissemination of information through all schools	No
Community	Local media campaign (press conferences, advertisements and billboards)	No
	Environmental approaches	
	Walking circuits in parks	Yes
	Street signs in public parking spaces	Yes
Social structure, policy and systems	Local media campaign (press conferences, advertisements and billboards)	No
	Sale and loan of pedometers (+ step-count logs) through	
	The local town shop	Yes
	The Ghent sport services department	Yes

Instruments

Physical activity questionnaire

The long version of the IPAQ was used to assess domain-specific (work, transport, house/garden and leisure time) physical activity in a usual week. The IPAQ has been shown to be a valid and reliable physical activity instrument at the population level in Europe [13] and in Flanders, Belgium [14]. Total time for physical activity expressed in min per week was computed and truncated at 2540 min week^{-1} to limit unrealistically high physical activity scores (www.ipaq.ki.se). Questions about participants' educational level (high school or lower/college or university), employment status (employed/unemployed) and health (excellent/very good/good/moderate/poor) were also asked.

Pedometer

The valid, accurate and reliable Yamax Digiwalker SW-200 (Yamax, Tokyo, Japan) was used to assess daily step counts [15].

Activity log

Participants were requested to note daily steps and keep daily activity records on an activity log for seven consecutive days. They were asked to record the date, steps taken at the end of the day and the type and duration of non-ambulatory activities (i.e. biking and swimming) at the end of each day. After returning the log to the researchers, 150 steps were added to the daily total for every min of reported biking and/or swimming [16]. All participants provided at least 3 days of pedometer records and average daily step counts were calculated [17]. Values over 20 000 steps day^{-1} were recorded as 20 000 to limit unrealistically high averages and to ensure normal distributions [18].

Questionnaire related to the awareness of the project

Participants were asked to complete the following questions: have you heard or seen any messages about physical activity? (yes/no). If yes, where did you hear it from? (open ended); have you heard of

the project '10 000 steps Ghent'? (yes/no) and did you use a pedometer during the past year? (yes/no).

Data analysis

Demographic (age, gender, educational level, employment status and health) and behavioural (pedometer-based and self-reported physical activity) characteristics were compared between 'completers' (completed data assessments in 2005, 2006 and 2009) in the intervention and comparison communities. Independent *t*-tests were used for continuous variables and chi-square tests for categorical variables. In each community, similar tests were used to compare the characteristics of completers and 'non-completers' (no data assessment in 2009).

To evaluate the long-term effects of the intervention on pedometer-based and self-reported physical activity, repeated measures analysis of variance (ANOVA) tests were conducted, with time (baseline 2005 and follow-up 2009) as within-subjects factor and community (intervention and comparison community) as between-subjects factor. These analyses were done for (i) the total sample and (ii) different subgroups based on various individual characteristics at baseline, namely age [25- to 45-year-olds (young) versus 46- to 65-year-olds (mid-aged) versus 66- to 75-year-olds (older)], gender (men versus women), educational level (lower versus higher educated individuals), employment status (employed versus unemployed individuals), health (poor to moderate health versus good to excellent health) and risk profile (individuals reaching 10 000 steps day^{-1} versus those not reaching 10 000 steps day^{-1} at baseline). In the subgroup analyses, the separate individual characteristics were included as additional between-subject factors in the repeated measures ANOVA. Effect sizes (Cohen's *d*) were computed by subtracting the change in physical activity in the comparison community from the change in the intervention community and dividing this score by the pooled standard deviation of change [19]. Effects sizes were interpreted as negligible (<0.15), small (0.15–0.40), medium (0.40–0.75) or large (>0.75) [19]. As the self-reported IPAQ scores were skewed, total IPAQ scores and domain-specific scores (work, transport, house/garden and leisure time) were first log transformed to obtain normal distributions. Parametric analyses were conducted with the log-transformed data; however, for reasons of clarity, mean and standard deviations reported in the text and table are non-transformed scores.

Chi-square tests were used to analyse the responses to the awareness questions. All analyses were performed in SPSS 15.0 for Windows (SPSS Inc., Chicago, IL, 2007) and statistical significance was set at a level of 0.05.

Results

Participants

Demographic and behavioural characteristics of the completers and non-completers in each community are shown in Table II. There were 216 adults (49% of the 2006 sample) in the intervention community and 204 (48%) in the comparison community. About half were men, more than half had a college or university degree and were employed and the majority reported good to excellent health. There were no significant differences between the completers in each community in terms of age, gender, educational level, employment status, health, pedometer-based and self-reported physical activity at baseline (2005) or for employment status and health at post-intervention (2006) or follow-up (2009, see right column in Table II).

In the intervention community, the only difference between completers and non-completers was that the completers were significantly older ($P < 0.001$) and a smaller proportion was employed in 2006 ($P = 0.003$) (see Table II). There were no differences between the completers and non-completers in the comparison community. The main reasons for not completing the survey in 2009 were relocation to another community (43%) and not being reached after three attempts (43%).

Awareness of the campaign

In 2009, 33.8% of the intervention sample and 29.6% of the comparison sample reported hearing

Table II. *Demographic characteristics and physical activity scores of completers and non-completers in the intervention and comparison community*

	Intervention community			Comparison community			Comparing the completers in both communities, t or χ^2 (P)
	Completers (n = 216)	Non-completers (n = 224)	t or χ^2 (P)	Completers (n = 204)	Non-completers (n = 222)	t or χ^2 (P)	
Demographics							
Age (years)	56.4 ± 12.3	51.3 ± 13.3	4.2 (***)	54.9 ± 12.2	53.1 ± 13.5	1.4 (ns)	1.2 (ns)
Gender (% men)	48.6	46.4	0.2 (ns)	53.4	51.8	0.1 (ns)	1.0 (ns)
Educational level (% college/university)	56.9	60.7	0.6 (ns)	56.2	51.6	0.9 (ns)	0.0 (ns)
Employment status (% employed)							
2005	63.0	71.4	3.6 (ns)	63.7	66.5	0.4 (ns)	0.0 (ns)
2006	55.3	69.2	9.0 (**)	56.7	52.3	0.8 (ns)	0.0 (ns)
2009	53.0			55.7			0.3 (ns)
Health (% good to excellent)							
2005	90.3	87.9	2.0 (ns)	88.7	85.6	3.0 (ns)	1.4 (ns)
2006	91.2	90.2	0.1 (ns)	89.2	84.7	1.9 (ns)	0.5 (ns)
2009	85.2			82.3			0.7 (ns)
Physical activity							
Pedometer-based (steps day^{-1})							
2005	9393 ± 4124	9793 ± 4380	1.0 (ns)	9739 ± 4028	9604 ± 4016	0.3 (ns)	0.9 (ns)
2006	10,202 ± 4247	10,745 ± 4344	1.3 (ns)	9827 ± 3958	9245 ± 3985	1.5 (ns)	
2009	9501 ± 4412			8925 ± 4054			
Self-reported (min day^{-1})							
2005	139 ± 103	126 ± 103	1.6 (ns)	157 ± 119	145 ± 112	0.5 (ns)	0.5 (ns)
2006	130 ± 111	149 ± 123	1.6 (ns)	144 ± 120	128 ± 115	1.2 (ns)	
2009	165 ± 100			182 ± 123			

Values are mean ± SD or %, ns = non-significant. **$0.001 < P \leqslant 0.01$, ***$P \leqslant 0.001$.

or seeing any message about physical activity promotion (χ^2 = 0.9, P = 0.351). In the intervention community, about 1% spontaneously indicated '10 000 steps Ghent' as the source of their information, while in the comparison community, 1.5% answered '10 000 steps Ghent' (χ^2 = 5.6, P = 0.588). Other sources of information were 'Start To Run' initiatives (intervention community: 18.5% and comparison community: 13.3%), the media (intervention community: 9.7% and comparison community: 10.8%) and health services (intervention community: 8.8% and comparison community: 5.4%). Almost three quarters (72.6%) of the intervention sample confirmed having heard of the '10 000 steps Ghent' project, which was significantly more than in the comparison community (32.5%) (χ^2 = 67.2, $P < 0.001$). In the intervention community, 7.5% of the sample reported using a pedometer in the last year compared with 11.8% in the comparison community (χ^2 = 2.3, P = 0.132). No significant gender differences were found in awareness in the intervention sample (data not shown), while in the comparison community, significantly more women than men were aware of any physical activity promotion (women: 41.1% versus men: 19.4%; χ^2 = 11.3, P = 0.001) and the '10 000 steps Ghent' project (women: 46.3% versus men: 20.4%; χ^2 = 15.5, $P < 0.001$).

Physical activity measures

Physical activity data at baseline (2005), post-intervention (2006) and follow-up (2009) are shown in Table II. A significant time (2005–09) by community interaction effect was found for daily step counts (F = 7.2, P = 0.008, Cohen's d = 0.09). Pedometer steps increased from baseline to follow-up in the intervention community [by 108 steps day^{-1}, 95% confidence interval (CI) = −353 to 569, t = 0.5, $P > 0.05$] and decreased in the comparison community (by 814 steps day^{-1}, CI = −1312 to −317, t = 3.2, P = 0.001; see Table II). Furthermore, the data revealed that the proportion of participants reaching the 10 000 steps day^{-1} target did not significantly change between baseline and follow-up in the intervention community (41.8–43.1%, t = 0.419, $P > 0.05$) or comparison community (41.9 – 39.7%, t = 0.713, $P > 0.05$).

Subgroup analyses showed that education level and health had an influence on the interaction effect on pedometer-based step counts. The interaction term for time by community by educational level was significant (F = 5.0, P = 0.026); in those with higher education, a significant time by community interaction (F = 11.4, P = 0.001, Cohen's d = 0.15) was found. Higher educated participants in the intervention community increased their steps from baseline (9560 ± 3880 steps day^{-1}) to 4-year follow-up (10 302 ± 4260 steps day^{-1}; change = +742 steps, CI = 105–1379), while those in the comparison community showed a step count decrease after 4 years (2005: 10 259 ± 3904 steps day^{-1}, 2009: 9422 ± 3825 steps day^{-1}, change = −837 steps, CI = −1512 to −163). No time by community interaction was found for the lower educated sample ($P > 0.05$).

There was also a significant time by community by health interaction (F = 7.8, P = 0.005). In those with good to excellent health, the time by community interaction was significant (F = 11.8, P = 0.001, Cohen's d = 0.12), showing a step count increase in the intervention community (2005: 9579 ± 4202 steps day^{-1}, 2009: 9836 ± 4396 steps day^{-1}; change = +257 steps, CI = −236 to 752) and a step count decrease in the comparison community from baseline (10 063 ± 4062 steps day^{-1}) to 4-year follow-up (9055 ± 4192 steps day^{-1}; change = −1008 steps, CI = −1543 to −473). The time by community interaction was also significant in those with a poor to moderate health (F = 5.3, P = 0.026, Cohen's d = 0.19). In that subgroup, step counts decreased over time in the intervention community (2005: 7503 ± 2859 steps day^{-1}, 2009: 6209 ± 3359 steps day^{-1}; change = −1294 steps, CI = −2442 to −147) but increased in the comparison community (2005: 7386 ± 2537 steps day^{-1}, 2009: 8046 ± 2528 steps day^{-1}; change = +660 steps, CI = 650–1970). No three-way interactions were found for age, gender, employment status and risk profile (data not shown) for pedometer-based physical activity.

Analyses for self-reported physical activity showed no significant time by community interaction ($P > 0.05$) in the total sample (see Table II). Univariate analyses on the domain-specific scores showed a significant time by community interaction for transport-related (F = 12.7, P = 0.001) and house/garden-related (F = 6.7, P = 0.011) physical activity. In the intervention community, transport-related (2005: 20 ± 28 min day^{-1}, 2009: 32 ± 32 min day^{-1}, change = +12 min, CI = 7–16) and house/garden-related (2005: 56 ± 56 min day^{-1}, 2009: 84 ± 64 min day^{-1}, change = +28 min, CI = 18–36) physical activity increased from baseline to follow-up, while in the comparison community, transport-related physical activity remained the same (2005: 14 ± 21 min day^{-1}, 2009: 13 ± 23 min day^{-1}, change = −1 min, CI = −5 to 4) and house/garden-related physical activity increased less (2005: 63 ± 65 min day^{-1}, 2009: 89 ± 78 min day^{-1}, change = +26 min, CI = 13–38) compared with the intervention community. No significant interactions were found for work- and leisure time-related physical activity (data not shown).

In the subgroup analyses for the total IPAQ scores, there were no significant three-way interactions between time, community and individual characteristics (data not shown), except for participants' risk profile at baseline. The time by community by risk profile interaction was found to be significant (F = 4.4, P = 0.037). For those who

already reached 10 000 steps day^{-1} at baseline, the time by community interaction was significant (F = 4.9, P = 0.028, Cohen's d = 0.04). Already active participants in the intervention community increased their self-reported physical activity significantly more (2005: 153 ± 95 min day^{-1}, 2009: 195 ± 95 min day^{-1}; change = +42 min, CI = 22–61) than already active participants in the comparison community (2005: 178 ± 119 min day^{-1}, 2009: 194 ± 122 min day^{-1}; change = +16 min, CI = −17 to 49). The time by community interaction in the 'at risk' group (less than 10 000 steps day^{-1} at baseline) was not significant ($P > 0.05$).

Discussion

The present study examined the long-term effects of the whole community '10 000 steps Ghent' project. The positive intervention effect, as seen after 1 year, was not sustained at 4-year follow-up. After some time, and following a period of no further promotion, step counts returned to baseline. In the comparison community on the other hand, step counts decreased substantially at 4-year follow-up, suggesting that the intervention was effective in preventing a considerable step count decrease over 4 years. It is likely that the significant overall step count decrease (8%) in the comparison community is due to ageing. In other long-term follow-up studies, control groups' physical activity levels were also found to decrease, even more than 8%. For example, control men and women reported, respectively, a 12 and 25% decrease in walking after 5 years of community intervention on lifestyle factors [20]. Another study showed that older adults reported a 21% decline in activity levels, 5 years after a 6-month controlled exercise trial [21]. The relative smaller decrease in the present comparison community may be explained by a 'contamination' effect as '10 000 steps' became also known in other parts of Flanders after the 1-year pilot intervention in Ghent.

For total self-reported physical activity, a positive intervention effect was only observed in already active individuals. For the domain-specific self-reported scores, significant 4-year follow-up interactions were only found for transport- and house/garden-related physical activity. One-year follow-up results on the other hand showed significant effects for work- and leisure time-related physical activity.

As no other long-term effectiveness studies of whole community pedometer-based interventions could be found, comparing our results with similar studies is not possible. However, the review by Sharpe concluded that the long-term maintenance of most community-based physical activity interventions is poor and that behavioural maintenance is enhanced by relapse prevention strategies and long-term follow-up contact with participants [12]. Others have shown that repeat interventions or booster strategies, such as mail, phone or internet reminders, group sessions or combinations of these strategies, may help to maintain increased levels of physical activity over time [11]. The fact that no real follow-up strategies or actions were implemented after 2006 in Ghent could explain why the positive 1-year effects were not maintained. The continued implementation of the project by the community itself was probably not intensive enough and consequently not sufficient to sustain the positive effects. Local communities may not have had sufficient confidence and/or skills to maintain the impetus of the project once the initiator took a step back. Indeed, it is possible that the development and implementation of the project relied too heavily on a 'top down' approach in its first year.

Other studies have investigated the influence of certain individual characteristics (risk profile and gender) on the maintenance of physical activity. As was the case in this study, McAuley *et al.* [21] also found that those with higher physical activity levels 2 years after a 6-month randomised controlled exercise trial were more likely to continue to be active 5 years after the intervention. Although no intervention effect was found in those not meeting the recommendation of 10 000 steps day^{-1} at baseline in the present study, Vandelanotte *et al.* [22] found long-term effects at 2-year follow-up in participants who did not meet the public health recommendations at baseline. Furthermore, Bock *et al.* [23] found no significant interaction effect for gender. In contrast,

other long-term interventions have shown gender differences in physical activity maintenance in favourite of male participants [24, 25].

An additional aim of the present study was to examine project awareness 4 years after the start of the campaign. The number of residents aware of '10 000 steps Ghent' increased in both communities (intervention community: 2006: 63.2%, 2009: 72.6%; comparison community: 2006: 10.4%, 2009: 32.5%) [9]. All other aspects of project awareness decreased in the intervention community, as did the number of individuals who reported using a pedometer during the last year (2006: 13.9%, 2009: 7.5%). In the comparison community, this number increased slightly (11.8%) compared with 2006 (9.5%), but there was no significant difference between the two communities in the proportion of individuals using a pedometer. The fact that more residents in the comparison community were aware of the project and used a pedometer (than at post-intervention) may again be explained by a 'contamination' effect. However, the increased awareness in the comparison community did not result in more physical activity.

While gender did not influence the intervention effect on physical activity, awareness differed between men and women, but only in the comparison community, where women were more aware than men of any physical activity promotion message and the '10 000 steps Ghent' campaign. In the intervention community, no gender differences were found in awareness level at 4-year follow-up, although this had been the case at post-intervention; in 2006, significantly more women than men had answered positively to most of the awareness questions. However, this did not result in a different effect on physical activity for men and women [9], indicating that awareness or knowledge does not automatically result in behaviour change [26].

Strengths and limitations

As far as we are aware, this is the first study to examine the long-term effectiveness of a whole community '10 000 steps' intervention. A strength was the use of both pedometers and self-reported physical activity data. The fact that we found different results using these two different methods highlights the importance of including more objective measures as well as questionnaires in intervention studies. Another strength was the relatively long follow-up period of 4 years. The maximum study duration in the review on the long-term effectiveness of physical activity interventions was 24 months after intervention onset [11]. The loss of participants at follow-up is, however, a limitation. However, while half the participants at post-intervention were lost-to-follow-up, the sample size was still substantial and those lost-to-follow-up (non-completers) in both communities did not differ significantly in pedometer-based and self-reported physical activity at baseline, gender, educational level or health status from those who completed the whole study. The fact that the completers in the intervention community were significantly older and less likely to be employed than non-completers, does indicate however that we did not have a particularly 'advantaged' sample at final follow-up. Still, compared with the total community populations, present participants were older, which limits the representativeness of the present study sample. Furthermore, it needs to be noted that effect sizes were negligible to small; however, smaller effect sizes are still of considerable importance for whole community interventions.

Practical implications

Present effects highlight the importance of community approaches to increase physical activity and to maintain these changes over time. Current findings can provide features that others may benefit from. Concerning long-term effectiveness of community approached, we learnt that extra attention should be given to follow-up strategies in order to maintain intervention effects. The findings also make a case for better community level coordination and strategies for continuing efforts that are initiated by university researchers.

Despite the lack of maintenance of intervention effects, the Flemish Government has now provided funding for the dissemination and implementation

of '10 000 steps' projects in the entire region of Flanders, just as the Queensland government had done for the earlier '10 000 steps Rockhampton' project [27]. The public health impact of the Flemish dissemination was recently evaluated using the RE-AIM framework [28].

Conclusions

This long-term follow-up study of the whole community '10 000 steps Ghent' project showed that a positive intervention effect was not maintained after 4 years. Notwithstanding, the decrease in physical activity seen in the comparison community was prevented.

Conflict of interest statement

None declared.

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