

## **Slí Path to Health Walking Routes in Rhode Island: Evaluation of a Community-Based Physical Activity Environmental Change Program: Preliminary Work**

**Carol Ewing-Garber, Ilissa G Lazar, Kate L. Lapane, John P. Hall, Susan Rose,  
Kimberly M. Greene, Bess Marcus, and Richard A. Carleton.**

### ***Abstract***

*Slí na Sláinte (Path to Health)* is an innovative environmental change program developed by the Irish Heart Foundation and franchised in the United States (USA) by the American Heart Association. The program involves the installation of walking paths on existing sidewalks located in close proximity to where people live and work. It is designed to promote physical activity, primarily walking, for leisure and good health among people of all ages. Rhode Island is the pilot site for the implementation of this program in the USA under the auspices of the Rhode Island Prevention Coalition. Grant support has come from community sponsors, the Robert Wood Johnson Foundation, the American College of Sports Medicine, and the American Heart Association to develop the infrastructure and to evaluate the effectiveness of the *Sli Path to Health* Program.

The evaluation of this environmental change program is ongoing and consists of several components using qualitative and semi-quantitative evaluation methodologies. The first method is to obtain simple counts of pedestrians walking along the *Path* routes and adjacent areas at selected locations, days, times and seasons. The second component is directed questioning of passers-by about their physical activity habits and recognition of the *Path* signs. The third evaluation method is a simple physical activity questionnaire administered in worksites adjacent to the *Paths* and by telephone survey of neighbourhood residents. The fourth method is the addition of questions about walking *Paths* to ongoing statewide population health surveillance. The last method is process evaluation obtained at every stage of the implementation of the program. The methodology is discussed in detail and lessons learned are presented.

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### ***Rhode Island Prevention Coalition***

The Rhode Island Prevention Coalition (PREVCO) is a public-private partnership of health care providers, insurers, voluntary agencies, universities, professional organisations, and others who are dedicated to improving the health of Rhode Island residents. Set within the Rhode Island Public Health Foundation, the Coalition enables the participating groups to coordinate efforts, share resources, and operate more efficiently towards their collective goal. As its first area of concern, PREVCO chose to address the problem of physical inactivity of Rhode Island residents through a multi-pronged program, the *Move It!* Campaign. This initiative is comprised of several components: 1) a grants program to community organisations to promote physical activity among those at the highest risk for physical inactivity, 2) environmental changes to increase physical activity, 3) communications and advocacy activities, 4) the member organisations of PREVCO address the problem of physical inactivity as part of their own organisational activities. PREVCO has gathered over \$600,000 in funding for infrastructure and programs through contributions from member organisations. Member organisations have also provided significant in-kind support.

### ***Slí Path to Health: The Concept***

Slí na Sláinte, translated as the Path to Health, is an innovative environmental intervention to promote physical activity developed by the Irish Heart Foundation. It is a passive approach that makes existing sidewalks more appealing as walking routes with signs. These colourful signs map out attractive routes that traverse historic sites, scenic parks, downtown business districts, and residential areas. In addition to showing the way, the signs, spaced at 1 kilometre (~0.5 mile) intervals, serve as distance markers. The Slí sign is a four primary colour image copyrighted by The Irish Heart Foundation with standardised guidelines for the reproduction of the image. *Slí na Sláinte* has already been implemented in more than 75 sites throughout Ireland and throughout the world.

### ***Slí na Sláinte--Path to Health: An Appropriate Intervention?***

Traditional programmatic approaches to promoting physical activity have not been very successful in increasing physical activity in the sedentary population.<sup>1 2</sup> More promising have been interventions using cognitive and behavioural components, particularly when tailored to the individual and when encouraging regular physical activity of moderate intensity.<sup>3 4 5 6 7</sup> However, it is unlikely that these tailored individual programs alone will reverse the trend of increasing sedentariness in industrial societies.<sup>8 9 10</sup> Studies of adults in the community and college students have identified exercise self-efficacy,

health knowledge, attitudes toward exercise, and participation in moderate activity at baseline, exercise self schemata (self perception as an exerciser), social support, and the environment as predictors of adoption of moderate intensity exercise.<sup>11 12 13</sup>

Environmental changes may be an effective way to promote physical activity, particularly when combined with behavioural, cognitive and other types of interventions.<sup>14</sup> In 1980, Brownell and colleagues<sup>15</sup> performed the first experimental paradigm of its kind to evaluate physical activity in the natural environment. Signs with the message, *Your Heart Needs Exercise---Here's Your Chance*, were placed near stairs with an adjacent escalator at a shopping mall, train station, and bus terminal. The results demonstrated that simple, inexpensive signs were capable of increasing physical activity. Other more recent studies have reported similar results.<sup>16 17</sup>

Proximity and accessibility to exercise facilities and the perception of convenience have been shown to influence participation in physical activity.<sup>18 19 20</sup> *Path to Health* is a way of making walking accessible to people where they live and work. Recent data on the use of new and improved walking trails in a rural community suggest that the proximity of facilities may affect the behaviour of the intermittent and regular exerciser rather than those who are completely sedentary, however these data are not definitive.<sup>21</sup>

*Path to Health* focuses on the entire community. A macro level approach such as this increases the likelihood of influencing a greater proportion of the sedentary segments of the population.<sup>8 14 22</sup> Rather than targeting the individual, it targets all segments of the population. It creates a permanent addition to the health promotion infrastructure, always accessible and available to all members of the community. The visibility of *Path* signs serve as a constant yet non-intrusive reminder to partake in activity. Moreover, the program provides a springboard for group-specific, sub-interventions in work-sites, religious organisations and neighbourhoods.

### ***Path Development, Funding, and Support***

The American Heart Association is the franchisee for the program in the United States, with Rhode Island as the pilot site under the direction of the Rhode Island Prevention Coalition. If the program proves to be successful, the American Heart Association will implement the *Path to Health* program nation-wide. The American College of Sports Medicine and Robert Wood Johnson Foundation awarded grants to PREVCO in support of the costs associated with the administrative functions of the *Path to Health* development and evaluation. Community sponsors donate the funds for *Path* hardware. The sponsor in turn receives recognition for its support on the *Path* signs, the brochures, and the map sign. Several financial institutions and hospitals to date have provided sponsorship for the *Path to Health*. In addition to monetary support, the city or town council must pass a resolution to approve the *Path* before it can be implemented in a community. Usually, the Planning and Public Works Departments will then assist in planning, installing and maintaining the *Path*.

### ***Evaluation Efforts: A Pilot Study***

Although the *Path to Health* has been implemented worldwide, no systematic evaluation of its effectiveness has been performed. Marketing research in Ireland showed that 75% of those questioned walk for pleasure and 63% of walkers on existing *Slí* routes thought that the distance signs were a benefit.<sup>23</sup> However, neither an actual

increase in physical activity in association with *Path* installation, nor the continuity between the *Slí* image and the concept it conveys has been evaluated.

Utilising the Centres for Disease Control and Prevention (CDC) Behavioural Risk Factor Surveillance System (BRFSS) with supplemental physical activity questions about the stages of change for physical activity (based on the Transtheoretical Model<sup>1</sup>) walking behaviour, and walking facilities, we will obtain an overall estimate of the prevalence of physical activity in Rhode Island throughout each stage of implementation. Additionally, we are employing three *Paths* specific, semi-quantitative and qualitative methods of evaluation that can be applied to each of the pilot communities once they are installed: a paper based survey, field interviews, and observations of effect. Taken together, these evaluations will describe physical activity behaviours and attitudes, sign recognition, and the efficacy of the intervention.

Baseline evaluation efforts in several communities are underway. As we proceed, we are constantly assessing the methodology in process, so that we can enhance the study design for future community evaluations. Systematic tracking and cross comparison of the eventual ongoing evaluations in the pilot communities will not only assist in identifying explanations for the success or failure of this environmental intervention to promote physical activity, but will also contribute to the national discourse on physical activity intervention research.

#### **State-wide Surveillance of Physical Activity**

In 1998 and 2000-2002, PREVCO has commissioned the addition of questions to the Rhode Island BRFSS that are designed to measure stages of change for physical activity and moderate physical activity consistent with the US Surgeon General's recommendations.<sup>24</sup> These questions extend the traditional BRFSS "physically active" classification from regular, leisure physical activity of any intensity  $\geq 3$  times per week for at least 20 minutes per session, to encompass lifestyle physical activity habits which include regular, moderate or vigorous physical activity during leisure or non-leisure activities for an accumulated total of at least 30 minutes per day on at least 5 days per week. In 2001, the CDC is piloting new "lifestyle" physical activity questions and PREVCO plans to add additional supplemental questions about walking and the use of walking paths and trails.

#### **Paper-Based Surveys**

Paper-based surveys are being used to estimate of physical activity behaviour and factors that influence physical activity in targeted neighbourhoods, worksites and organisations near the *Paths*. This self-reported, confidential survey is comprised of thirteen multiple choice questions pertaining to walking and other physical activity done during the past month; intentions to increase walking and physical activity in the next six months; sedentary habits; and assessment of the surrounding environment near or around the home or workplace. Questions were adapted from several validated physical activity instruments.<sup>25</sup> A separate section indicating general demographics such as height, weight, sex, age, ethnic background, marital status, and employment is also included. These paper and pencil questionnaires have been administered to samples of convenience in some locations and distributed in a more systematic manner in other locations, depending on the co-operation obtained in these sites. Respondents return them to a central location. The obstacles in obtaining responses from these different

types of venues are in large part due to the difficulty of gaining entrée and permission to sample in these places. With more resources, a mail-in or telephone survey would have been preferred in some settings. In some workplaces, we have been unable to sample all employees and this may result in a selection bias, although this bias should be consistent at all sampling time points and have the effect of swaying the results towards the null, indicating that there is less of an effect. We have attempted to achieve a greater return rate of the survey and thereby reduce the likelihood of this type of bias, by offering incentives for completion of the questionnaire such as entry into a raffle with prizes such as T-shirts and sports bottles. Timing of the distribution of the survey has been carefully considered so as not to conflict with other dimensions of the evaluation procedure; the observations of effect must be completed before the raffle prizes are displayed since both the water bottles and T-shirts advertise the *Path to Health*.

### **Field Interviews**

In order to determine the visibility and recognisability of the *Path to Health* image, a sign identification interview was developed. This form depicts the *Path to Health* sign embedded amongst 4 other commonly known universal traffic signs, including a *Hospital* sign, a *School Crossing* sign, a *Food* sign, and a *No U-turn* sign. Additionally, one foreign image, the PREVCO logo is incorporated as a decoy. This was done to detract from the obvious unfamiliarity of the *Path* sign during baseline data collection.

Field interviews are conducted on the street and in places where people gather (eg. stores and shopping areas) around a one-mile radius of the *Path* before and after the signs are installed and periodic post-testing is done to determine whether sign awareness increases. It is expected that during the pre-test period (before the signs are up), respondents will have no recognition of the *Path* sign and little to no awareness of the PREVCO logo. After the signs are up, we expect that the *Path* signs will have more recognition. (There should be no difference between the recognisability of the PREVCO signs with the introduction of the *Path* signs.) At this time, we will also be able to determine whether the *Path* signs are self-explanatory. Problems with the field interviews have included the difficulties in getting people to stop and talk to the field interviewer and, in some cases, threats to personal safety.

It is expected that installing the signs alone will have a small effect, but when combined with promotional activities based upon behavioural and cognitive approaches, the effect should be much greater, since the intended audience will be exposed to the intervention.<sup>26</sup> The degree of *Path* sign familiarity (ie. recognition and understanding) due to the signs alone will provide an evaluation of the effectiveness of these promotional efforts.

### **Observation of Effect**

In order to quantify the effects of *Path to Health* on walking, a protocol for observation along the route has been developed. These observations entail counting the number of people walking along the predetermined *Path* during a one to two months period before the signs are installed (baseline), for two months after the signs are installed (immediate effect), and for several months after installation (long term maintenance). To ensure comprehensive coverage of the activity along the *Path*, observations are carried out weekdays and weekends at selected one-hour intervals between the hours 7:00 am to 6:30 p.m. at two to four different observation sites. Prior to selecting the observation sites an informal investigation to determine the best possible observation sites along the

*Path* is made. The sites are chosen based upon spatial and geographic orientation, the proximity to potential intervention sites and away from bus stops or other places where people might congregate regularly. Each observation period is chosen according to the time the most probable *Path* usage would occur. Each observation site is observed at least four times during the evaluation span. We have encountered some difficulties with our observers being questioned by the police and neighbourhood residents because they appear to be loitering and there have been some episodes of threats to personal safety. We have begun to work with the local police to resolve these problems.

### ***Methodological Considerations***

Observations made to date have made us aware of certain issues regarding counting, site selection, research assistant recruitment, and seasonality that are inherent, yet unforeseeable, given the novelty of this type of methodology.

### **Counting of Pedestrians**

We are committed to counting people who are engaging in purposeful walking. Subjects, however, are not part of a closed laboratory experiment. It seems that, rather than walking in a straight line, “jay-walking” and crossing at areas other than appropriate crosswalks is commonplace, making it difficult to determine exactly who is a *Path* walker. This is perhaps an indication that most of the people counted are walking for transportation as opposed to walking for exercise.

### **Selection of Observation Sites**

Two of the early observation sites were located at intersections with non-*Path* sidewalks. People would start on the non-*Path* sidewalk, momentarily walk along the *Path*, but only as “trespassers” until they reached their non-*Path* destination. In considering future observation sites, we have chosen sites that are in the middle of a block rather than at an intersection. This eliminates the need for the observer to judge whether a person is actually a *Path* walker.

Choosing sites where other information might be available to supplement our observations is also an evaluation strategy. For example, we are using a shuttle bus log at a worksite in conjunction with our counting data. The shuttle serves the employees and staff members who park their cars in a remote parking lot one-mile away, on the *Path* route. Part of our intervention will be to encourage those who park there to walk to work instead of taking the shuttle, so these records will indicate if we are indeed affecting our target population. If so, we should see a rise in the number of walkers along the *Path* and a fall in the number of shuttle riders.

### **Research Assistant Recruitment and Training**

Since we are trying to capture a true estimate of the activity along the *Path*, it is necessary to devote as many hours to counting pedestrians as scheduling permits. Recruitment of reliable research assistants to dedicate this kind of time proves to be difficult. Besides the monotonous and tedious nature of counting each passer-by, the observer must be able to provide his own transportation to the observation sites.

Although counting pedestrians appears to be a simple task, it requires considerable judgement about who to count along the path. For example, should a person who walks by the observer, turns around and walks by again be counted twice? We have instituted a rigorous training protocol for the research assistants to ensure a consistent counting methodology. We are also trying to assign observers to one or more observation sites for each of the phases to promote consistency. An evaluation co-ordinator is responsible for the overseeing all the counters, periodically spot-checking each site, making certain that procedure is proceeding according to protocol.

### **Seasonality and Weather**

Since the observation time frame extends over a significant amount of time, we must control for weather. For example, one *Path* opened in the late spring of 2000, necessitating baseline observations to be obtained during the temporal weather patterns of a New England spring. We have instituted a process where subsequent observations will be made at the same time during the year, in order to determine the effects of seasonality on pedestrian traffic. It is more difficult to control for weather conditions, but we are trying as much as possible to match observations on sunny, overcast and stormy days in subsequent observation days.

### **Discussion**

The *Path to Health* was developed to increase levels of physical activity in the community through an ecological framework. Ecological theory proposes that the environment affects physical activity behaviour, and, thus, can be altered to promote physical activity in all aspects of daily living including work, transportation, leisure, and household chores.<sup>27</sup> Specific aspects of this model include altering the physical environment to encourage increased human energy expenditure and increase physical activity rates, while making it less convenient to be sedentary.<sup>27</sup> These strategies are passive and do not require active decision making on the part of the participant. For example, building codes could be changed to provide centrally located safe stairways with elevators or escalators strategically placed, or only accessible to those who are unable to climb stairs; parking lots could be placed at suitable walking distances from buildings; and direct automobile entries to city centres could be restricted and replaced with attractive footpaths, walking or jogging trails, and cycling paths.<sup>8 28</sup>

The need for reintegrating lifestyle physical activity into our daily habits is evident. Over the past 20 years, the number of people walking to work has decreased significantly.<sup>29</sup> This change in energy expenditure can be attributed in large part to massive investments in automobile manufacturing and construction of an extensive system of highways and roads.<sup>29</sup> Whereas in 1970, United States Census data revealed that 7.4% of respondents walked to work, that number dropped to 5.6% in 1980. The most recent 1990 estimates show that number to have lowered even more to 3.9%.<sup>29 30</sup>

In 1990, 6.9% of respondents in the United States either walked to work or worked at home whereas, in a typical Rhode Island community, Pawtucket, only 5.9% walked to work or worked at home.<sup>29</sup> Although we cannot determine the proportion of the Pawtucket residents who walk to work versus working at home, the numbers are extremely low and are consistent with our pedestrian observations. This serves to further emphasise the impact social and environmental constructs have on physical activity. The Census Bureau has grouped these two categories together because these

data will be used for planning highway improvements, developing public transportation services, to design programs to ease traffic problems during peak periods, conserve energy, and reduce pollution.<sup>30</sup>

Ecological models, however, do not suggest that environmental barriers to physical activity are the only factors relating to inactivity.<sup>14 10 27</sup> A distinct feature of this relatively new physical activity paradigm acknowledges that interpersonal and cultural factors (development, social networks, and public policies), as well as physical environments affect physical activity behaviours. Because *Path to Health* incorporates individual promotional programs as components of a more comprehensive population based approach, it is a quintessential model of an ecological intervention.

Yet given the weak, inconsistent changes in knowledge, benefits, and attempts to increase physical activity in association with the interventions of the Pawtucket (Rhode Island) Heart Health Program (PHHP), there may be some hesitancy to embrace the *Path to Health* as a mass means to reach the entire population.<sup>31</sup> However, the lack of long term effect by PHHP on exercise habits might be partially explained through the diminished emphasis of exercise in relation to all other risk factors attributed to cardiovascular disease at the time (blood pressure, nutrition, smoking, weight loss, and exercise). Even still, at the peak of the Pawtucket Heart Health Program interventions only 17% of all subjects enrolled in PHHP exercised regularly.<sup>32</sup> Perhaps communities will be more receptive to *Path to Health's* emphasis on moderate intensity "lifestyle" physical activity as opposed to the more regimented exercise classes of PHHP, as would be suggested by the experience with PHHP's tailored community physical activity intervention *Imagine...Action*<sup>7</sup>, and other more recent "lifestyle" physical activity interventions.<sup>4 5</sup>

Traditionally, the most frequently used means to assess habitual activity patterns in the population is by self-report.<sup>33</sup> Yet, even the best self-report measures have considerable error in reliability and validity.<sup>25 34</sup> Self-reported survey data are limited by their dependency on participant cooperation and memory.<sup>35</sup> It is also unknown how accurately adults can report the intensity of their physical activity. An investigation performed by Spelman and colleagues<sup>36</sup> to determine the adequacy of self-selected intensity levels of volunteer habitual walkers revealed an unexpected insight: while subjects would have rated their own levels of intensity as low or moderate (a cost of 3 METs as estimated by the Canada Fitness Study), they actually walked at a mean self selected level of 5.2 METs (considered vigorous by the Canada Fitness Study). Indeed, this type of misclassification would result in a large underestimation of actual activity.

Additionally, the discordant survey results between the 1998 Rhode Island BRFSS core questions and supplemental questions indicate that estimates of physical activity prevalence vary according to the questions utilized.<sup>24</sup> Definitions of what constitutes sufficient physical activity determines the number of respondents who are classified as physically active. If lifestyle physical activity consistent with the US Surgeon General's recommendations is used, then estimates of physical activity prevalence increases.<sup>30</sup>

Using direct observations of lifestyle physical activity behaviour, we may be able to substantiate whether self-administered and population based surveys that rely on self report depict actual lifestyle physical activity habits. The largest area of concern in this portion of the evaluation involves the possibility that through site and time selection,

pockets of physical activity behaviour change will go unnoticed. We must also acknowledge that our evaluations will not entirely reflect the success of affecting progress through physical activity stages of the Transtheoretical model, as we are only measuring stages of change through our population surveillance. For example, it will be difficult to quantify the efficacy of *Path to Health* in altering a person's change from Precontemplation to Contemplation or Contemplation to Preparation solely through our current evaluation strategy.<sup>37</sup> Each segment of this all-encompassing evaluation is meant to complement the other. We hope that where one measure might be imperfect, another may help to compensate. By a broad, "big brush" evaluation protocol, we will gain a greater perspective of the trends and patterns of physical activity participation. Co-ordination of all these efforts has proven to be the most difficult task of this endeavour.

### **Conclusion**

Sustained community effort with reinforcement from promotional programs will largely determine the success of the *Path to Health* intervention. Installation of signs alone will not increase physical activity. Promotion will play an instrumental role in preventing the *Path to Health* signs from blending into the landscape. Unlike Brownell, et al., Andersen, et al., and Blamey et al, who simply posted signs and observed the effects, the goals of the *Path to Health* campaign are embodied in the image rather than the message.<sup>15 16 17</sup> The *Path to Health signs* do not directly communicate an idea; but rely on visual literacy, evoking emotions through images and colour. The written text extends the meaning of the image and the image elaborates on the text.<sup>38</sup> If these signs were meant to act as decision prompts, as the signs in the earlier interventions were intended, they would distinctly state, "Follow These Signs to Reduce Your Risk of Cardiovascular Disease" or "Physical Activity is Good for Your Heart, Mind, and Body: Follow the Signs for a Path to Better Health."

Instead, the *Path to Health* signs serve as an icon that must be interpreted and accepted over time, allowing for a certain amount of conditioning to occur. Population-wide increases in physical activity will be slow and evaluations will be ongoing. The greatest challenge of the *Path to Health* program then, lies largely in creating such a strong association between the idea of physical activity and the image that the signs will perpetually continue to stimulate and motivate the population to "Move It!"

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